11ème CONGRES de l'ASSOCIATION FRANCO JAPONAISE d'ORTHOPEDIE

BORDEAUX 2 – 4 JUIN 2011

BORDEAUX CITE MONDIALE CENTRE DE CONGRES

LIVRE des ABSTRACTS

SESSION 1 Modérateurs Pr J P COURPIED (Paris) Pr K. KANEKO (Tokyo)

1. **8h 30 F. LINTZ, C. TANAKA Presenting a month-long surgical trip to Kyoto in Autumm 2009** FRANCOIS LINTZ, MD, Dept. of Orthop. Surg., Univ. Hosp. Of Nantes, France CHIAKI TANAKA, MD, Dept. of Orthop. Surg., Kyoto City Hosp., Japan

   From mid November to mid December 2009, the author, then a resident, was given the opportunity to undertake a surgical trip to the city of Kyoto, Japan.

   Surgical lists were attended to in three orthopaedic departments in Kyoto and one in Osaka. The main theme was Hip Surgery and Arthroscopy.

   The aim of this presentation is to report on the surgical and cultural experience gained during this trip. The author whishes to thank the Japanese Orthopaedic community for this fantastic experience and to encourage young orthopaedic residents to take or create this kind of opportunity during their residency, with the help of the SOFJO.

2. **8h 38 T. KAWASAKI, K. SHICHIKAWA, E. ISOYA, K. KIKUCHI, N. OKOMURA, Y. MATSUSUE Prevalence of total hip and knee arthroplasty cases in Japan: Population based epidemiological study**) Department of Orthopedic Surgery, Shiga University of Medical Science Yukioka Hospital, Osaka, Japan takukawa@aol.com

   OBJECTIVE: The numbers of total hip arthroplasty (THA) and total knee arthroplasty (TKA) cases has been increasing in Japan. In the present study, we investigated the prevalence of those using a population-based study.

   METHODS: All registered residents including children of the Kamitonda district of Wakayama, Japan, which totaled approximately 3000 individuals, were invited to participate in this study in 2003. The distributions by sex and age in the study population were similar to those in the general Japanese population. First, we sent a questionnaire asking about rheumatic complaints, then examined those who answered that they had such complaints either past or present. After taking a medical history, a physical examination was performed.

   RESULTS: The overall response to the questionnaire was about 90%. Of those, 7 (6 females, 1 male) underwent THA (n=3) or TKA (n=4). Among all subjects, the prevalence rates were 0.25% for both males and females, 0.08% for males, and 0.42% for women. In addition, the prevalence of individuals over 60 years who underwent THA or TKA was 1.14%.

   CONCLUSION: Our population-based study showed that the overall prevalence of THA and TKA cases in Japan is approximately 0.25%.

3. **8h 46 K. OINUMA, R. KANAYAMA, T. TAMAKI, H. SHIRATSUCHI Impact of total hip arthroplasty by the direct anterior approach on urinary incontinence** Funabashi Orthopedic Hospital. oinuma@fff.or.jp

Direct anterior approach (DAA) allows for the implantation of total hip arthroplasty (THA) without cutting any muscles including the short rotator muscles. The obturator internus functions not only as the short rotator muscle but also as the pelvic floor muscle in combination with the levator ani. Urinary incontinence is common among middle aged or older women and is caused by dysfunction of the pelvic floor muscle. We hypothesized that the obturator internus preservation during THA would improve the function of the pelvic floor muscle and resolve the urinary function especially for women. Data were obtained from 102 women (122 hips) who had a primary THA using DAA at our hospital. The mean age was 62.2 (33~84). The preoperative diagnosis was OA in 119 hips and ON in 3 hips. Patients completed the International Consultation on Incontinence Questionnaire - Short Form preoperatively and 3 months postoperatively. Preoperatively, 30(29.4%) patients stated to be incontinent of urine. In these 30 patients, the urinary incontinence was resolved in 20, not changed in 10 three months postoperatively. In 72 women who were continent preoperatively, no patient became incontinent postoperatively. We considered that the increased tightness of the obturator internus by THA could pull up the urethra in combination with the levator ani and resolve the urinary incontinence.

4 **8h 56 P. CHIRON, N. REINA, E. CAVAIGNAC, JM. LAFOSSE Intérêt de la voie médiane de la hanche minimale invasive** Toulouse

It has been described in children and in the spastic some approaches of the hip trough trans adductors. Ludloff but Ferguson go behind the adductor brevis and pectinate, narrow lanes which run the risk of damage to the obturator nerve. We describe an approach easy to reproduce, minimally invasive: The incision is made in hip flexion, external rotation, abduction, the pubic insertion of adductor longus along the projection of muscle in six to 8 cm. The fascia of the adductor longus is incised until the muscle fibers are visible. A gentle finger dissection in the muscle sheath common to the three previous adductor muscles leads directly to the lesser trochanter. Two spacers are put in place on both sides of lesser trochanter exposing the lesser trochanter and the tendon of the iliopsoas muscle. Dissection of the iliopsoas tendon, which is focused on a winding (the tendon followed by its opposite side leads to the ships). A cons bent retractor is positioned between the anterior capsule and the medial tendon pushing the tendon laterally and exposing the capsule. The capsule can be extra-articular exposed by pushing up the elevator to the medial posterior circumflex pedicle. The capsule is then incised longitudinally along the inter-trochanteric line and acetabular peri. It is possible to see the inside but also in anterior cervical rotate hip. The bottom and front of the head are visible ilio pubic branch and all the upper and medial wall of the acetabulum can be exposed. Directions: We performed 29 medial edge. 9 periprosthetic pain, 4 for fresh fractures of the femoral head in a posterior dislocation, 4 for old fractures of the femoral head in a posterior dislocation, 3 chondromatosis, 3 for tumors of the femoral head or the wall of the acetabulum, 6 peri arthritis retractable outside arthroplasty. Hip arthroplasty (7) or no (6), the median pain can be caused by the existence of a peri arthritis with retractable presence of adherent synovial fringes femoral neck entering the joint space whose release has d 'obtained in 11/13 cases sedation pain. Conclusion: The Way of medial hip must be part of the armamentarium of any orthopedic, accessible with a steep learning curve.

5 9h **04** **K. OE, H. IIDA, T. WADA, N. OKOMOTO, T. NAKAMURA Subtrochanteric shortening osteotomy combined with cemented total hip arthroplasty for sevevely dislocated hips** Department of Orthopaedic Surgery, Kansai Medical University oeken@hirakata.kmu.ac.jp

OBJECTIVE: The present study was conducted to evaluate retrospectively the utility of cemented total hip arthroplasty (THA) with subtrochanteric shortening osteotomy for severely dislocated hips, and to assess the relationship between leg lengthening and nerve injury.
METHODS: We reviewed 35 consecutive cases of cemented THA with transverse subtrochanteric shortening osteotomy in 27 patients with a mean follow-up of 38.6 months (12 to 96). There were 26 women and 1 man with a mean age of 64.8 years (35 to 80) at the time of the operation.
RESULTS: The mean Japanese Orthopaedic Association hip score improved from 48.6 points (16 to 74) to 83.8 points (62 to 97) at final follow- up, and the mean pre-operative flexion was 89.7 degrees (20 to 130).
The mean leg lengthening in spina malleolar distance was 40.0 mm (15 to 70), and was greater in patients who had good flexion. No nerve injury was observed, and bone union of the osteotomy site was achieved in all cases except for 1 malunion.
CONCLUSION: This technique not only allowed for correction of severe femoral abnormalities and gave definite rotational stability, but also minimized the potential complications and produced excellent clinical results. Further, any nerve injury was not related to leg lengthening, and was not caused by good flexion in the severely dislocated hip.

6 **9h 12** **M. MATSUURA, T. KURODA, M. ITOKAZU, T. SUZUKA, K. KAZUKI Direct anterior approach in minimally invasive total hip arthroplasty; postoperative radiographic assessment for hybrid THA** Department of Orthopaedic Surgery, Osaka-City General Hospital, matsuura218@k7.dion.ne.jp

In total hip arthroplasty (THA), direct anterior approach (DAA) is a muscle splitting approach that can avoid muscle damage during operation and can accelerate post-operative recovery. Through this approach, exposure of the acetabulum is facilitated, while anterior elevation of the femur is critical to provide sufficient access to the femoral canal. The purpose of the present study is to clarify the postoperative radiographic assessment for Hybrid-THA through DAA.

Methods : Between April 2009 and February 2011, we performed fifty MIS-THAs(Hybrid-THAs) through DAA. The average age at operation was 65.4 years. The average BMI was 23.9kg/m^2. We evaluated operation time, blood loss, complication, implant alignment, cement mantle of stem and functional recovery.

Results : The average operation time was 117.5 minutes, and blood loss 534.4ml. Forty-five cups were implanted within safe zone of Lewinnek. Varus head alignment were seen in five hips, Valgus head alignment was seen in one hip. Cement mantle of forty stems were in Grade A(Barrack et al.). Postoperative dislocation, deep infection, DVT, PE were not observed in any case. Transient femoral nerve pulsy was seen in one hip Conclusion : MIS-THA through DAA was effective in reducing invasion, in reduced frequency of dislocation.

.

7 **9h 30 S. IIDA, H. OHASHI, S. KISHIDA, T. YAMAZAWA, Y. TANABE Biomechanical analysis of initial stability of cemented acetabular cup using impaction bone grafting with mixture of hydroxyapatite granules**1) Matsudo City Hospital2) Saiseikai Nakatsu 3) Chiba University Hospital 4)Niigata University

The impaction bone grafting (IBG) can restore acetabular bone loss in revision total hip arthroplasty (THA), while enough bone allografts are not easy to obtain and the quality is not always sufficient. Thus we mixed hydroxyapatite (HA) granules into allografts to supplement the volume and to augment the mechanical strength of bone grafts. The purpose of this study was to investigate the effect of mixture of HA granules in the initial stability of the cup fixed with IBG.

MATERIALS

A hemisphere defect of 60mm in diameter was made in composite test blocks. We tested 4 different bone/HA ratio; HA 0%, 25%, 50% and 100%. The grafted materials were impacted using impactors, then a polyethylene cup was fixed with bone cement. A dynamic load of 150N to 1500N with a frequency of 1 Hz was applied for 15 minutes with MTS, followed by 300N to 3000N for 15 minutes. Then the load was released for 15 minutes. The cup migration was traced by a high-speed photography camera. Elastic recoil and visco-elastic recoil were calculated.

RESULTS

A strong negative correlation was observed significantly between the amount of migration and bone/HA ratio. A significant correlation was observed in elastic recoil, however, not observed in visco-elastic recoil.

CONCLUSION

These results indicated that the mixture of HA granules to allografts stabilized the cup during loading period as well as load releasing period.

8 **9h 38 M. MARAYAMA, K. TENSHO, S. WAKABAYASHI, H. OTA, H. KODAIRA, T. KAMIJO, M. TANAKA, K. KITAGAWA Less invasive rotational acetabular osteotomy**
Department of Orthopedic Surgery, Shinonoi General Hospital, Ai 666-1, Shinonoi, Nagano City 388-8004, Japan. sgh_iizu@grn.janis.or.jp

We report less invasive rotational acetabular osteotomy (RAO).

SURGICAL TECHNIQUE: The skin incision is curved line over greater trochanter in 11-17 cm length. Greater trochanter is osteotomised and the acetabulum is exposed by retraction of medial gluteal muscle without detachment from iliac crest. The ilium (acetabulum) and ischium are cut in continuity. In addition, lateral part of the osteotomised acetabulum is cut in trapezoid or lunate form to make bone graft without additional exposure of the ilium.

PATIENTS: We performed RAO for 65 hips by using this procedure during 2001 and 2009. Of 65 hips, early- stage osteoarthritis were 30 hips and advanced-stage 35 hips. The mean age of the patients was 38.7 +/- 9.9 years old at the time of surgery, and the mean duration of follow-up was 5 years.
Clinical follow-up was performed with use of Japanese Orthopaedic Association (JOA) score. Radiographically, the center-edge (CE) angle, the Sharp angle and acetabular head index (AHI) were evaluated

RESULTS: The mean CE angle, Sharp angle, and AHI improved from -3.1 degree preoperatively to 35.5 degree postoperatively, 50.8 to 39.2 degree, and 52.2 to 94.8 %, respectively ($p<0.00001$). No progression of osteoarthritis was shown in the hips with early-stage osteoarthritis. The JOA scores were significantly improved at the time of final follow-up postoperatively except for seven hips with preoperative advanced-stage osteoarthritis. These hips had radiographic evidence of progression of osteoarthritis.
DISCUSSION AND CONCLUSIONS: Clinical results were similar to the other reports. This surgical technique will prove a great boon to the patients undergoing RAO.

9 **9h 46 P. CHIRON, N. REINA, E. CAVAIGNAC, JM. LAFOSSE La butée de hanche par voie minimales invasives** TOULOUSE

The shelf arthroplasty is an old technique which by a classical approach, proposed by Lance (1925), had a low morbidity rate and results known on a long period. A minimal invasive approach reduces the magnitude of the operation, its consequences and might allow one to broaden its indications. The approach is then a 4-cm long way at antero-lateral part of the hip. A 3X3-cm cortical-cancellous autograft is applied using a guide wire positioned by fluoroscopy and the osteosynthesis is based on a perforated screw. 76 cases were review on more two years view (4.6 years of average, 8.2 years) The average hospitalization period lasted for three days; patients have to respect partial weight bearing for two months and no one has been placed in a re-education center. 75% patients had a completely painless hip without limiting their activity. 93% shelves are consolidated with a callus in three months; 6 % nonunion was due to , in part,a technical mistake. No infection, no phlebitis, no palsy of the cutaneo lateral nerve has been deplored.

10 **9h 54 T. YAMASAKI, Y. YASUNAGA, T. YOSHIDA,S. OSHIMA, J. HORI, K. YAMASAKI, M. OCHI Hip arthroscopy for labrum tear.** 1) Department of Orthopaedic Surgery, Graduate School of Biomedical Sciences, Hiroshima University2) Department of Artificial Joints and Biomaterials, Graduate School of Biomedical Sciences, Hiroshima University tacyama@hiroshima-u.ac.jp

Purpose: To evaluate postoperative result of hip arthroscopy for labrum tear Patients and Methods: Twenty patients (21 hips) were treated with arthroscopic debridement for labrum tear of the hip. The mean age at surgery was 45 years (16 to 74 years), and the mean follow-up period was 23 months (6 to 41 months). Preoperative diagnosis was osteoarthritis (OA) in 12 hips, labrum tear in 8 hips. Results: The mean clinical score using Merle d'Aubigne and Postel scoring system improved from 14 to 17. Progression of OA was observed in 3 hips, and total hip arthroplasty was inevitable in 2 hips. Radiographically, the mean preoperative CE angle was 21 degrees, AC angle was 14 degrees, Acetabular head index was 78%, and α angle was 65 degrees. Cross-over sign was observed in 5 hips, and bump formation in 11 hips. Two cases with obvious bump formation were treated with arthroscopic osteochondroplasty at the femoral head-neck junction.

Discussion: Our indication of hip arthroscopy is the case that labrum tear or femoroacetabular impingement is suspected by the findings of MRI, plain radiograph, and 3DCT. 3DCT is the most useful for detecting bump formation at the anterolateral head-neck junction, which indicates cam type FAI. On managing labrum tear, correlation with FAI should be considered.

11 **10h02** **S. YANAGIMOTO, M. TEZUKA, M. KAMEYAMA, K. INOUE, S. NAKAYAMA, T. KOMIYAMA, Y. KITTA, H. HOTTA, H. KANEKO, Y. FUJITA, A. FUNEYAMA, Y. YABUKI, T. SAKAI** **Usefulness of the CT-based navigation system for THA. Comparison between two different matching and fluoroscopy matching**1) Dept. of Orthop. Surg., Saiseikai Central Hospital, Tokyo2) Dept. of Orthop. Surg., Tokyo Dental College, Ichikawa General Hospital, Ichikawa3) Dept. of Orthop. Surg., Saitama National Hospital, Saitama4) Dept. of Orthop. Surg., Keio Univ., Tokyo5) Dept. of Orthop. Surg., Tokyo National Medical Center, Tokyo6) Dept. of Orthop. Surg., Saitama Central Hospital, Saitama

Introduction: We have used two different navigation systems for THA by now. The old one is CT-based land-mark matching system (L method) and other (new one) is CT-based fluoroscopy-matching system (F-method). We compared the accuracy of socket setting angle with these two systems and discuss the usefulness of navigation system.

Material: Materials were 241 THA patients using these navigation systems. 152 cases were with L method and 89 patients with F method. The values between verification angle by navigation during surgery and post-operative CT measured angle were calculated and compared.

Results: The absolute difference in F method (89 cases) was on average 2.9 degree in inclination, and 2.8 degree in anteversion. The absolute difference in L method (152 cases) was on average 4.2 degree in inclination, and 4.4 degree in anteversion. The values in F method groups showed high accuracy ($P<0.01$).

Discussion: Socket setting is sometimes inadequate especially from unstable fixation in lateral position and severe deformity of hip joint. Absolute errors in socket setting with theses two systems were within 5 degree on average. These results showed the usefulness of both navigation systems. F method is new technology using image matching on computer. It is easy to learn procedure and showed high accuracy. L method is conventional procedure and needs skill to use correctly. But it needs short additional time and so it is convenient for skilled-doctor.

12 **10h 10 H. YO, H. OHASHI, Y. KOSE, F. INORI, Y. OKAJIMA, K. FUKUNAGA, H. TASHIMA Positioning of the cementless cup for Crowe I to III hip dysplasia**

Department of Orthopaedic Surgery, Osaka Saiseikai Nakatsu Hospital

In THA for dysplastic OA, dealing of the acetabular bone defect is a concern. Proximal and medial positioning of the cup can increase the bone coverage The purpose of this study is to evaluate the bone coverage in relation to the height of cup center in pre-operative templating for Crowe I to III hip dysplasia and investigate the outcome of cementless cup fixation for these hips.
. [Patients and Methods] We operated 65 hips with dysplasitic OA (Crowe I to III) in 2006. There were 5 males and 60 females with an average age of 63.8 years. Forty-four hips were categorized in Crowe I, 15 hips in Crowe II, and 6 hips in Crowe III. In all cases, cementless cup was fixed without structural bone graft. In 27 cases, bone chips obtained from acetabular reaming was packed at the bone defect. We used Plasma cup in 32 hips, Trillogy in 24, and Mallory head in 9.

In pre-operative templating, we measured the cup CE angle (modified center-edge angle of Wiberg's method) to evaluate the bone coverage. We positioned the cup at true acetabulum and 10 mm proximal. In post-operative radiographs, the cup CE angle, the height of cup center, medialization of the cup, and leg lengthening were measured. Clinical outcome was evaluated using JOA hip score.

[Results] When the cup was positioned at the true acetabulum, the cup CE angle was 14 degrees in Crowe I, -17.0 in Crowe II, and -17.0 in Crowe III. After 10 mm proximal displacement, the angle increased to 34.0, 12.5 and 5.8, respectively.

On the post-operative radiographs, the average cup-tear drop line distance was 16.4 mm in Crowe I, 22.7 in Crowe II, and 29.0 in Crowe III. The average cup CE angle was 16.3 degrees,, 12.5, and 5.7, respectively. After the average follow-up periods of 3.3 years, all cups were stable with bony fixation. JOA hip scores were improved from 53.4 points to 80.6.

[Discussion] In Crowe I, the cup could be fixed almost at the true acetabular level. In Crowe II and III, the cup was fixed at 6 to 13 mm proximal in average. Owing to the proximal positioning of the cup, the bone coverage was obtained similarly to that in Crowe I. These results indicated that all cementless cups were stable with bony fixation and the clinical outcome was satisfactory in THA for Crowe I to III hip dysplasia.

13 **10h 18 K. KANEKO, H. IWASE, A. MOGAMI, K. SHITOTO, M. NOZAWA, K., MAEZAWA, T. YUASA, H. KOBAYASHI La mesure de la fixation initiale de la prothèse cotyloïdienne <press-fit> durant l'intervention chirurgicale. A propos du diamètre de la tête prothétique.** Centre de Chirurgie Orthopédique et TraumatologiqueLa Hôpital de l'Université Juntendo, Tokyo

La solidité de la fixation des prothèses de hanche de type Press-fit (PFAC) est évaluée durant l' intervention chirurgicale. Entre juin 1996 et avril 2010, des cupules cotyloïdiennes PFAC ont été mises en place sur 532 patients.
Le couple de torsion T généré au niveau de la cupule lors de l'appui sur une jambe, peut être obtenu par : T=RxfxL, (R=diamètre de la tête prothétique, f= coefficient de friction, L=poids de la jambe en position debout).
Mais récemment, comme la taille de la tête est plus grande, il faut faire attention au fait qu'il devienne nécessaire d'augmenter la force de la fixation initiale

.

11h Program Session 2
Modérateurs 1 Dr J. CATON (Lyon) 2 Pr H IIDA (Osaka)

14 **11h 00 T. KAJIWARA, M. HACHIYA, M. SATOH, K. ITOH, K. YAMADA, T. ATSUMI, S. TAMAOKI Acetabuloplastic massive bone graft with cementless acetabular components for the treatment of dysplasic hips**1) Yokohama Minami-kyosai Hospital2) Showa University, Fujigaoka Hspital

INTRODUCTION: Le but de cette étude prospective était évaluer les ré sultats d'une série continue d'arthroplasties totales de hanche sans ciment avec autogreffe massive acétabuloplastique pour dysplasie congé nitale de hanche de 3 à 8 ans de recul.
MATÉRIEL: Nous avons revu de 130 arthroplasties totales réalisées chez
118 patients (103 femmes, 15 hommes) , âge en moyenne 61 ans. Selon la classification de Crowe, 86 hanches group 1, 32 hanches group 2 , 4 hanches group 3.
TECHNIQUE OPERATOIRE : La première fraise est perpendiculaire à l'axe du corps afin d'atteindre l'arrière-fond. On augumente progressivement la taille des fraises en prenant l'orientation definitive (40˚d'inclination et 20˚d'antéversion). En preparation de greffe, on rabote la greffe en forme de ‟ club-head ". Avant la realisation de la butée par la prothèse acétaburaire, on visse autogreffe avec deux vis. La dernier fraise est ré alisée après la vissée autogreffe pour obtenir une cavité acétabulaire parfaitement sphérique.
RÉSULTQTS: Il n'y a pas eu de complication septique et on note quatre luxation . Pour les autres patients, deux revision a éte effectuée. Sur les radiographies, il n'y a pas eu de variation d'inclination plus de trois degré, Il n'y a eu aucune migration de l'implant.
CONCLUSION: Cette technique réalise l'installation de cupule à palé ocotyle et augmente le stock de l'os cotyloidien. Les résultants à moyen terme est fiable et acceptable.

15 **11h 08 S. MAKI, S. IIDA, C. SUZUKI, T. KAWAMOTO Does postoperative thigh pain diminish in European type cementless total hip arthroplasty?** Department of Orthopaedic Surgery, Matsudo City Hospital

Background. Thigh pain is a significant complication after cementless total hip arthroplasty (THA). The purpose of this study is to examine mid-term outcomes after THA and the correlation between thigh pain and radiographic findings.
Methods. A cohort of 129 primary THAs was followed for a minimum of two years (mean, 44.4months; range, 22-84 months). The clinical evaluation was performed with Japanese Orthopaedic Association (JOA) score, and the frequency and the severity of thigh pain were also examined. Postoperative radiographs were evaluated for radiolucent line, spot welds, stress shielding, subsidence, and cortical hypertrophy.

Results. Of the 129 hips, 31 hips had thigh pain (24.0%). Severity of thigh pain was mild in 23 hips, moderate in 5 hips, and severe in 3 hips. Although 13 hips demonstrated thigh pain at latest follow up, no hips required medication or revision surgery. The average JOA score improved 42 points preoperatively to 89 postoperatively. There was no correlation between thigh pain and any radiographic findings
Conclusion. Published reports associated thigh pain to implant instability, however, in this study thigh pain was developed in well fixed femoral component. The cause of thigh pain in cementless THA could be considered to the abnormal stress (tensile or shear stress) transferred from well fixed cementless femoral component to bone.

16 **11h 16 J. CATON, JL. PRUDHON, Over 25 years survival after Charnley'total hip arthroplasty** Lyon France

Since 1962, the low friction arthroplasty (LFA) developed by Sir John Charnley has spread widely throughout the world. Many series have reported long-term results. Polyethylene (PE) wear is well known. The average wear ratio is about 0.1 mm a year. Many factors may influence that wear process.

Purpose The authors describe two different series of patients operated on with Charnley's total hip arthroplasty (THA) (in 1972 and in 1969 till 1974), using the original cemented stem ad a non modular 22.2 mm head, with a cemented full polyethylene acetabular socket. Outcomes confirm excellent patient function after 25 years (25 to 38 y FU). They emphasise the fact that PE is the weak point of total hip arthroplasty. Function may be excellent even though PE wear is significant. In several cases, no wear at the maximum follow-up was detectable.

Results This study confirms different publications relating long-term follow-up with LFA. During a Charnley meeting in Lyon, we published a survival curve of 85% after 25 years. Berry et al. published a 86.5% survival curve (J. Bone Joint Surg Am 84:171-177, 2002). In 1995, Luc and Marcel Kerboul published a 77% survival rate after 20 years in young patients under 40 years old at the time of the surgery. In 2009, Callaghan et al. Published a series of 35 years follow-up with a ratio of 78% survivors hip (J.Bone Joint Surg Br 91:2617-2621).

In our series of patient with a follow up more than 25 y (25 to 38 y) with a mean FU of 26 y one third of the patients have a wear more than 1 mm by year (1 to 3), one third of 1 mm by year and one third less than 1 mm by year.

Conclusion Could the long-term results be improved ? Through recent decades, many solutions have been introduced to improve the survivorship of THA including bearing surfaces such as alumina-on-alumina and metal-on-metal. Different problems have occured with these solutions. LFA might be improved by working on the nature and the quality of the head. Improvements might also be obtained by working on the quality and the hardness of the acetabular socket.

17 **11h 24 F. LINTZ, T. NOAILLES, F. GOUIN, C. TANAKA Fibular autograft in acetabular reconstruction : a two centre, retrospective study of 27 cases** Dept. of Orthop. Surg., Univ. Hosp. Of Nantes, France ; Dept. of Orthop. Surg., Kyoto City Hosp., Japan

Acetabular reconstruction for segmentary defects aims for stability and integration. Fibular autografting has been described in tumoral but to our knowledge not periprosthetic osteolysis. We hypothesise that this offers a reliable solution with good functional results and acceptable morbidity.

Patients and Methods

This is a two center (Nantes, Kyoto) retrospective study of 27 hips between 2001 and 2007. The following data was collected: diagnosis, loosening, Postel-Merle d'Aubigné score. Radiographic assessment included Moreland classification of loosening, d'Antonio bone loss classification and acetabular migration. Operative technique included fibular grafting of segmentary defects, iliac for acetabular fossae with granulated calcium phosphate ceramics, morcelated allograft and metal reinforcement plating. Results Follow up was 40.6 months. Loosening was mechanical in every case. There were 70% mixed bone defects. The PMA score increased from 10.2 (7-12) to 14.6 (8-18) ($p<0.001$). Acetabular migration was 1.5(0-4) mm vertically and 0.5(0-2) mm medially. No graft osteolysis was observed. Four prostheses were revised (1 loosening, 1 infection, 2 periprosthetic fractures). Discussion Fibular autografting after mechanical loosening with segmentary bone defects offers a reliable solution for acetabular reconstruction. Our results were at least equivalent to other techniques at 3.5 years follow up with a failure rate of 4.3 %. These encouraging findings will have to be confirmed through further analysis of prospective, comparative series.

18 **11h 32 L. SEDEL, D. HANNOUCHE, F. ZADEGAN, R. NIZARD**

Revision of ceramic on ceramic failures **Hospital Lariboisière and university of Paris Denis Diderot (Paris 7)**

Reasons to revise a ceramic on ceramic articulation are different from regular material. No macrophagic reaction leading to osteolysis or aseptic loosening. In a consecutive series of 138 revisions in 126 patients the major reason was socket loosening. Limited acetabular exchange was performed in 108 cases. Alumina ceramic fracture was the cause in 4,6% of the cases. Recurrent dislocation in 3%, unexplained pain in 6,8 %. No patient was revised for noise generation.

After alumina head fracture, revision must be done in emergency, complete excision of all debris and capsule. Then if the Morse taper looked ok, another ceramic head can be used.

In case of liner fracture: we recommend exchanging the metal back as well and retaining the stem.

In the majority of revision for isolated acetabular loosening, it was possible to implant another socket. Depending of the age of the patient at revision, we have the choice in plain cemented polyethylene socket, or metal back. Then we can use a special metal back with many holes and a special pubic screw which gives a very strong fixation. There is also the possibility to implant a metallic cone augmentation system. But we have not used this material at the moment.

Another characteristics of these revision is the quality of the remaining bone, the absence of osteolysis, due to the absence of foreign body reaction, authorize a relatively simple operation without bone reconstruction and early weight bearing. This is another advantage of the ceramic on ceramic couple.

19 **11h 40 C. TANAKA, T. KITAORI, H. KANOE, R. NAGAHARA, Y. KIM, T. KOBAYASHI Impaction bone grafting using CMK stem system in femoral revision** Department of Orthopaedic Surgery, Kyoto City Hospital dkalq201@kyoto.zaq.ne.jp

Fifty-nine femoral revisions using Impaction Bone Grafting (IBG) with CMK stems were performed in our department from 2003. Thirty-three hips in 33 patients followed up for more than one year were analyzed in this study. The average age at operation was 67.3 years. The causes of revision were femoral loosening in 19 hips, femoral osteolysis in 7 hips and septic hip in 7 hips. The approach was transtrochanteric in all hips. Standard stems were used in 31 hips and long stems were used in 2 hips. JOA hip score was improved from 59 points to 81 points at the last follow-up. Complications were dislocations in 4 hips, intra-operative fracture in 2 hips and post-operative fracture in 1 hip. Stem subsidence was noted in 4 hips. In all of 4 hips subsidence was less than 2 mm. Cortical repair was noted in 21 hips (63.6%). Femoral revision using Impaction Bone Grafting (IBG) with CMK stem seems to be an effective method without major subsidence.

20 **11h 48 F. INORI, H. OHASHI, H. YO, Y. OKAJIMA, K. FUKUNAGA What is the cause of large error in THA image-free navigation?** Department of Orthopaedic Surgery, Saiseikai Nakatsu Hospital

(Purpose) In THA, OrthoPilot 3.1 image-free navigation system (B. Braun Aesculap, Tuttlingen, Germany) is reported to be acceptable for its accuracy of cup angle, leg-length and femoral offset-changing. However, several cases showed large error. In this study, we investigated the error of this system and analyzed the cause of large error.

(Material and Method) 99 THA cases performed with this system were objected. After operation, cup angles were measured on CT and converted into radiographic angles. Leg-length and femoral offset-changing were measured on plain radiograph. In each factor, the absolute difference between navigated value and measured value was defined as error. Surgical approach, operator, implant, BMI, fat volume, and pelvic tilt were investigated to analyze the cause of large error.

(Results) For anteversion of cup, lateral approach, large fat volume, and pelvic posterior tilt caused large error. Anterior approach affected cup inclination, cement-less stem affected leg-length, and lateral approach affected femoral offset-changing.

(Discussion) No need of CT and simple preoperative planning were advantages of image-free navigation system. However, less accuracy were reported compared with CT-based systems. We will continue to investigate more cases more precisely to know the pitfalls of this system and to minimize large error.

21 **12h H. IIDA, T. WADA, K. OE, N. OKAMOTO, T. NAKAMURA, T. ASEDA, H. TOKUNAGA Thirty-year experience of acetabular bone grafting in cemented total hip arthroplasty** Department of Orthopaedic Surgery, Kansai Medical University

Although the role of the acetabular bone grafting in improving long-term results of total hip arthroplasty (THA) for dysplastic hip has been widely recognized, sophisticated surgical techniques are essential to achieve the maximum longevity. We gradually improved relevant techniques from the data of follow-up study since 1980. The first follow-up study include 133 hips with an average of 12.3 years follow-up. Parametric survivorship analysis indicated that trochanteric nonunion, delayed trabecular reorientation of the bone graft and lateral placement of the socket were risk factors for loosening of the acetabular component. The second follow-up study include 147 hips using improved surgical techniques with an average of 11.8 years follow-up. Operations were performed through a direct lateral approach with partial trochanteric osteotomy to avoid nonunion of the greater trochanter. Bioresorbable poly(l-lactide) screws were used for fixation of the acetabular bone grafts to prevent any possible delayed remodeling. Preoperative planning using computer simulation was performed to estimate the optimal size and position of the acetabular component.

Based on these experiences, we performed 534 acetabular bone grafting in THA with further improved technique during these ten years. There are no revision due to ascetic loosening of the acetabular component in these ten years. Our results indicate excellent long-term clinical survivorship of a cemented acetabular component with acetabular bone grafting for dysplastic hip.

22 **12h 10 Invited lecture: Pr Akira KOBAYASHI : « un hôpital de campagne offert par la France à l'occasion du grand séisme du Kantô (région de Tokyo, Japon) en 1923 »** Fukuoka, Japon

Le 1er septembre 1923 à midi moins deux minutes, un grand séisme, d'une magnitude estimée à 7,9 sur l'echelle de Richter dévaste la plaine du Kantô, la partie centrale de l'île de Honshû dont font partie Tokyo et Yokohama.

Très vite, le Japon reçoit une aide internationale en provenance de plus de 50 pays. En France, le Syndicat de la Presse Parisienne mobilise les donations privées dont la somme se monte à environ trois millions de francs français de l'époque, et envoie, par deux paquebots français un hôpital de campagne mobile par deux paquebots français pour les victimes.

Toutefois, l'hôpital arrive à Yokohama 40 jours après le séisme, et l'utilité de cet hôpital est vite remise en question. Saisissant l'occasion d'un tel don, le bureau japonais d'aide aux victimes du séisme décide de l'utiliser pour un programme expérimental de soins aux enfants chétifs. Le projet comprend des soins médicaux, de l'éducation physique et nutritionnelle, de sorte à améliorer la santé de ces enfants et à en faciliter le retour à une vie normale. En quatre mois, l'hôpital de campagne a assurément porté ses fruits, non seulement dans le domaine de la pédiatrie, mais a également influencé l'évolution de la santé de toute la population japonaise.

3 Session 3

Modérateurs 1 Dr N.BENAMMAR (ALBERVILLE) 2 Dr S. IIDA (Chiba)

23 **14 h 00 N. BENAMMAR, M. ABU AL ZAHAB, D. ERNOTTE Results of synthetic ligamentoplasty in repair of types III and IV acromioclavicular disjunctions. About 116 cases.** CHAM Alberville , CHAM Bourg Saint Maurice,

We report the results and outcomes within 6 years follow-up of 106 patients operated on in a 11 years period for type III and type IV (50%) acromioclavicular dislocations. The mean age was 36 years. 61% were winter sports accidents, 28% were due to others sports traumas (mountain bike, rugby, soccer, roller, climbing), 11% concerned other injuries (fallings). The operative procedure has been constant by using a synthetic ligamentoplasty for coracoclavicular stabilisation. Three devices have been used: LAC 2T (SEM*) (60%), LIGASTIC (Orthomed*) (33%) and LARS (Biomet*) (7%). The patients have been reviewed by ourselves, some of them living far from our hopsitals or abroad have been examined by their family doctor and fulfilled a detailed questionnaire including the Constant score.

At a mean follow up 6 years, clinical and functional results were excellent and very good in 92% (Constant Score 80 to 100), good in 4% (Constant Score 70 to 79), medium in 4% (Constant Score 60 to 69).

Complications were 1 clavicle fracture treated with internal fixation with complete healing, one early mechanical failure re-operated on, and 2 loss of tension of the ligament. All these 4 patients achieved medium results.

We did not observe any osteolysis, nor tunnel, nor symptomatic osteoarthritis at 6 years follow up. Some small bumps could be seen as inesthetic but asymptomatic and without any functional effect. Regarding the good results and low morbidity of this technique, we purchase using this procedure that allows a satisfying stabilization of the acromioclavicular joint.

24 **14h 08 T. KOBAYASHI Clinicals results of primary repair for subscapularis tendon tears** Department of Orthopaedic Surgery, KKR Hokuriku Hospital

Subscapularis tendon (SSC) tears are frequently detected in arthroscopic shoulder surgery. We evaluated clinical results of primary repairs for subscapularis tendon tears.

Methods Forty shoulders, which were followed up for at least one year and evaluated by MRI at one year after operation, were evaluated in this study. Twenty-eight were men, 13 women. The average age at operation was 65.2 years old, and the average follow-up periods was 18 months. Postoperative clinical results were evaluated by

Constant score. The postoperative cuff integrity and the fatty infiltration were evaluated by Sugaya and Goutallier classifications on MRI.

Results Three solitary SSC tears, 14 three tendon tears, and 24 SSC and supraspinatus (SSP) tears are included. Average Constant score was improved from 45 to 80 points. Postoperative cuff integrities at SSCs were rated as type 1 in thirty-three, type 2 in six, type 4 in one, and type 5 in one. Those at SSPs were rated as type 1 in twenty-seven, type 2 in four, and type 3 in two, type 4 in one and type 5 in three. The postoperative fatty infiltrations at every cuff muscles were evaluated as no change in comparison with those in pre-operation in most cases.

Conclusion The suitable SSC and ISP repairs brought excellent postoperative results in cases with grade one or two preoperative fatty infiltrations. However the postoperative fatty infiltrations were not improved and some symptoms about SSC insufficiency were apparent in cases which have severe fatty infiltrations in this short term follow-up study.

25 **14h 16 A. NIMURA, A KATO, K. YAMAGUCHI, T. MOCHIZUKI, K. AKITA The anatomical study of superior capsule of shoulder joint** Unit of Clinical Anatomy, Graduate School, Tokyo Medical and Dental University

There are no studies to date which refer to the details of the attachment of the articular capsule of the superior shoulder joint. The aim of this study was to measure the length of the attachment of the articular capsule on the humerus, and to clarify the anatomical details and the functional relationship to the footprint of the supraspinatus and the infraspinatus.

Methods

Twelve embalmed shoulders were used for anatomic study. The articular capsule was reflected and the attachment of the articular capsule on the greater tuberosity was exposed. The length of the attachment of the articular capsule and the footprint of the supraspinatus and the infraspinatus were measured.

Results

At the posterior margin of the infraspinatus, the average length of the attachment of the articular capsule was 9.1mm at the maximum length. At the point of the minimum length of the articular capsule, the average length of the attachment of the articular capsule was 3.5mm. The distance from the anterior margin of the greater tuberosity to the point of minimum length of the articular capsule was 10.9mm.

Conclusion

The attachment of the articular capsule of shoulder joint occupied a substantial area of the greater tuberosity. In particular, at the border between the infraspinatus and the teres minor, the very thick attachment of the articular capsule compensated for the lack of attachment of muscular components.

26 **14 h 24 Y. FUKAYA, H. OBA, K. SATO, S. KITAMURA, T. ANDO, Y. HIGUCHI The clinical outcome of arthroscopic rotator cuff repair** Department of orthopedic Surgery, Nagoya Daini Red Cross Hospital

In this study, we report the clinical results of arthroscopic rotator cuff repair (ARCR) demonstrated between May 2008 and August 2010 in our institute.

Materials and Methods: Consecutive 28 patients (30 shoulders) who met the criterion that minimum follow-up period would be more than 6 months, were evaluated with regard to clinical and structural outcome after ARCR. The mean age at the operation was 65.9 years. The average duration of pre-operative and post-operative follow-up was 5.6 months and 16.8 months, respectively. Japanese Orthopedic Association score for shoulder joint (JOA score) was used for the clinical assessment and the evaluation of cuff integrity was conducted with Sugaya's classification. Complications related to ARCR were investigated concurrently in our study

Results: Over all, the average JOA score at post-operation was 93.3, which had been significantly improved compared to pre-operative JOA score (59.7) ($p<0.001$, Mann-Whitney U-test). In terms of cuff integrity, re-tear rate was 17% (5 of 29 shoulders), including type 4 and 5. The mean JOA score of re-tear group was 83.4, which was significantly lower than no-tear group (JOA score: 95.3) post-operatively. The intra-operative complications were seen in 3 cases, which would be related to the fragility of the bone. Moreover, 2 serious complications, which were cardiac arrest and systemic convulsion, were observed in our study.

27 **14h 32 M. SCARLAT, E. BAULOT, P. TROUILLOUD Third generation Grammont reverse total shoulder arthroplasty (RTSA)** Clinique Chirurgicale St Michel, Toulon, France
University of Dijon Medical School, Dijon, France

Introduction: The glenosphere design in reverse total shoulder arthroplasty using a medialized center of has evolved significantly since its description by Paul Grammont in 1984. The 1st generation ("Trumpet" prosthesis) used a 2/3 sphere glenosphere that was cemented around a glenoid face and scapular neck with a non-modular polyethylene humeral cup. The 2nd generation (Delta III) introduced cementless fixation of the metaglene augmented with screws along with a modular humeral component but utilized a hemispheric glenosphere. The 3rd generation (DuoCentric) has an arc subtended that is greater than a hemisphere to provide articulation between the glenosphere and humeral cup medial to the glenoid and below the scapular neck. The hypothesis was that the first and the second generation RTSA are not adapted to the glenoid neck variability, which can result in a high percentages of failures due to mechanical problems such as glenoid notching or instability and loosening. Material and Methods: Implants were inserted in the matched humeral and scapular cadaver specimens. The radius of curvature tested in all the cases was 36mm. 2nd generation implants (Delta III) were inserted by lowering their center of rotation on the inferior portion of the glenoid while providing complete inferior baseplate coverage. Range of motion was measured and the presence of impingement was noted. Results: The 2nd generation implant caused direct contact during physiologic adduction of all specimens. Additionally, in specimens with 2nd generation implants, in maximum adduction, there was noted to be lateral translation of the humeral cup against the portion of the sphere. The 1st and 3rd generation implants allowed full physiologic adduction of the humerus without causing impingement between the scapular pillar and the humeral cup.

Conclusions: 1st generation RTSA had high rates of mechanical failure of fixation. However, in patients with surviving implants, notching has not been reported. When the surface area of the glenosphere was decreased during the evolution of RTSA from the 1st to 2nd generation, this allows notching and impingement between the humeral cup and the glenoid to occur during adduction. Additionally, when a 2nd generation glenosphere is lowered below the glenoid face, this allows potential edge loading of the glenosphere against the polyethylene cup. 3rd generation glenosphere designs with inferior coverage of the scapular neck prevent notching, improve adduction to physiologic levels, and minimize edge loading of polyethylene.

28 **14h 40 Y. YAMANO, Nerve grafting- experimental study and clinical cases** Osaka City Graduate University

For the cases of large nerve defect, the autogenous nerve grafting using the cutanous nerve a useful method to recover function. I have done nerve grafts to the large defect of important nerves in various difficult cases. To elucidate nerve regeneration and recovery after nerve grafting, I have studied electrophysiological examination in clinical cases and electrophysiological and histological studies in experimental nerve grafting using rabbits.

From clinical and experimental studies nerve recovery will be expect more than 70% that of normal. To improve the recovery of nerve graft, it is necessary to increase the number and myelin thickness of regenerated nerve fibers.

29 **14h 48 C.TALEB, P. LIVERNEAUX Arthroscopic interposition arthroplasty of the trapeziometacarpal joint** Department of handSurgery, Strasbourg University Hospitals,Illkirch,France

In Thumb carpo-metacarpal (cmc) arthritis, the use of interposition techniques (polylactic acid, pyrocarbon, dacron) has been observed to increase for some time past. These techniques are most often combined with open or arthroscopic complete or partial trapeziectomy. This article reports the results at one year of the arthroscopic interposition of an absorbable implant performed without combined trapeziectomy.
Methods Our series included 25 patients aged 60.5 years in average, presenting with osteoarthritis of the trapeziometacarpal joint that had been medically treated for 18.5 months in average. All patients were operated on by 1-U (ulnar) and 1-R (radial) portals. After joint debridement, a polylactic acid implant was inserted under arthroscopic control. Outcome evaluation consisted of the assessment of pain intensity, grip strength, pinch strength, opposition, thumb abduction and Dell radiological staging.

Results The average follow-up duration was 14 months. Postoperative radiological data showed significant differences from baseline clinical data regarding all evaluated variables: 0.68 vs. 3.5 for pain, 24.76 Kg vs. 16.64 Kg for grip strength, 6.44 vs. 3.64 Kg for pinch strength, 8.6 vs. 7.28 for opposition, 81.2° vs. 69.6° for thumb abduction, and 1.08 vs. 2.88 on the Dell stage. Eleven complications occurred, among which a type 1 complex regional pain syndrome, 1 sepsis, and 9 inflammatory reactions that resolved after an average of 3 weeks.

Conclusions Our technique is simple, rapid, cost-effective, and does not necessitate any trapeziectomy, even partial. It meets the same indications than those of other non radical interventions. The follow-up duration of our study was too short for long-term evaluation but short term outcome appeared superior to that of other published series. The regional inflammatory reactions that occurred in our series were transient and probably related to implant resorption. Our promising results suggest extending the indication of arthroscopic interposition to more advanced stages of proximal joint osteoarthritis.

30 **15h 56 K.NAITO, P. LIVERNEAUX Oberlin procedure for restoration of elbow flexion with Da Vincirobot : 4 cases** Department of Orthopaedics, Juntendo university,Tokyo,Japan Department of handSurgery, Strasbourg University Hospitals,Illkirch,France

Robotics allows to magnify the vision until 40 times, the movements of the surgeon until 10 times, and to eliminate the physiological trmor. These properties should allow to develop the mini-invasive surgery of the limbs, in particular the brachial plexus. The purpose of this work was to test the feasibility of the reanimation of the elbow flexion according to the technique of Oberlin by means of a robot Da Vinci.

Methods

Our series included 4 patients (average age 31 years) presenting with a elbow flexion palsy. They were operated on 8 months after the accident with a robot Da Vinci S®. Three patients were operated under open procedure (technique 1), the last one by mini-invasive approach (technique 2). The assessment of the results consisted in measuring the strength of elbow flexion.

Results After 1 year of follow-up, all the patients recovered a flexion of the elbow. No sensitive neither motor deficit was found. The technique 1 took place without any trouble. The technique 2 required a conversion in technique 1 because of an embarrassment in the vision of the operative field.

Conclusions The results of our series demonstrate the feasibility of the technique of robotic-assisted Oberlin procedure. The lack of sensory feedback was not an issue. The development of specific retractors and instruments should allow to improve the mini-invasive technique.

31 **15h 04 E.H. MASMEJEAN Evaluation of a new collagen membrane (Cova ™ ORTHO) in guided tissue regeneration for tenolysis or neurolysis in upper limb surgery. Priliminary results.**

Purpose
In order to prevent adhesions and fibrosis formed after surgery, several solutions have been tested: medical treatments, cover flaps and biomaterials. In orthopaedic surgery, especially after in traumatology, the lack of validated biomaterials leads to re-intervention for neurolysis or tenolysis. In this study, we evaluate a new collagen membrane.
Methods
The analyzed membrane (Cova™ ORTHO, Biom'Up) is composed of 100% collagen

After a previous surgery performed mostly in emergency, all involved patients have required a second surgery with the use of the tested membrane. After neurolysis or tenolysis, the wet collagen membrane, is placed around the tissue. Fifteen patients, mean age 50y.o. were included for 7 tenolysis and 8 neurolysis. Before surgery, each patient showed a severe pain with irritative syndrome and/or stiffness of the affected joints. All second surgeries consisted in the freedom of nerves and/or tendons and the protection of the tissue by the membrane.
Results
No allergic or inflammatory responses were observed.
After 2 to 11 months, 7 excellent or good results were observed after tenolysis, and 7 excellent or good results were observed after neurolysis. One patient obtain a fair result (4^{th} ulnar neurolysis).
Conclusions
Authors reports a significant reduction of previous irritative syndromes and a recovery of mobility in preliminary results of a prospective clinical study performed to assess the efficiency and tolerance of a new collagen membrane used after neurolysis and tenolysis.

32 **15h 12 Y. YAMANO Emergency microsurgical composite graft for severe injuries**
Osaka Microsurgery Center

We have done emergency vascularized composite graft by microsurgery for open tissue defects in extremities. It is essential to cover bones, joints tendons etc. with vascularized cutaneous flap to prevent infection and subsequent functional recovery. Eighteen patients aged 3-55year old with an average age of 23.1 y.o. were treated with this technique. Traffic injuries of leg in children were the most common (n=7) and others are open severe fractures etc. The composite graft employed were parascapular flap, peroneal osteocutaneous flap, latissimus dolsi flap and venous flap. The advantage of these flaps to cover the damaged structure primarily facilitates rapid tissue repair without infecction and scar formation. In fact, except one reoperation due to a skin necrosis in parascapular flap, all flaps successfully covered the severe damaged bone and joints. Sufficient perfusion of antibiotics by these flap prevents infection in all cases. Emergency vascularized composite graft for severe injury with tissue defect is shown to be an extremely useful method with rapid tissue repair. These lead to early rehabilitation and excellent functional recovery.

33 **15 h 20 C.E. TALEB, M. GUSTAVO, P. LIVERNEAUX Treatment of benign tumors of the hand using osteoscopy** SOS main, CCOM, Hand Surgery Strasbourg University Hospitals2)Sao Paulo Hand Center, Ben. Portuguesa Hospital, Sao Paulo, Brazil

Curettage and bone grafting are used traditionally to treat benign bone tumors of the hand. Some authors are proposing minimally invasive treatment using endoscopy. Our purpose is to standardise this technique based on a study of the number and locations of entry points.
This is a report on three benign metacarpal bone tumors treated with three different endoscopic approaches: multiportal, extended uniportal and oblique uniportal.

In theory, the multiportal approach has several drawbacks: weakening of the bone cortex, a limited visual field and seepage of injectable phosphocalcic cement. The extended uniportal approach causes cortical defects, unacceptable in a minimally invasive technique. The oblique uniportal approach seems less troublesome; vision of the bone cavity is good, curettage of the tumor is complete, the bone cortex is undamaged and there is no leakage of injectable phosphocalcic cement. All things considered, the oblique osteoscopic uniportal approach seems to be the best option for the management of benign bone tumors of the hand.

34 **15h 28 M. YASUMA The problem of intra-focal nailing in trochanteric femoral fracture surgery** Department of Orthopedic Surgery, Yamachika Memorial Hospital

Objectives: To compare the accuracy of the fracture reduction between “Intra-focal Nailing” which was inserted the nail through the fracture site and rest of the cases.

Design: Retrospective X-ray film analysis of 77 patients into two study groups: those inserted the nail from the fracture site (Intra-focal group; n=43) and rest of the cases (Extra-focal group; n=34). Most of all cases were treated by single surgeon. Patients: All patients over the age of fifty-five years (mean age=82) presenting with fractures of the trochanteric region caused by a low-energy injury, classified as AO/OTA Type 31-A1, A2 and A3.

Intervention: Treatment with an intramedullary nail (Japanese PFNA: Proximal Femoral Nail Anti-rotation, Synthes, Switzerland modified in Japan). Main Outcome Measurements: Intra and postoperative complications, fracture healing and failure of fixation, gait function at the last follow-up and TAD (tip apex distance) measurements with an electronic digital caliper.

Results: The minimum follow-up was fourteen months and 97% fractures were healed. Though these satisfactory clinical results, we found a statistically significant difference of TAD between the two groups of patients.

Conclusions: “Intra-focal Nailing” is easy to loose the accuracy of the fracture reduction. We will propose some solutions to that problem.

35 **15h 36 A. WATANABE, Y. MATSUMOTO, K. NAKAYAMA Novel unidirectional porous hydroxyapatite for the treatment of the tibial plateau fractures: a preliminary report** Department of Orthopaedic Surgery, Kenpoku Medical Center, Takahagi Kyodo Hospital

Porous hydroxyapatite has been used as a bone substitute instead of autogenous bone grafts because of its osteoconductivity, as well as no donor site morbidity. A novel unidirectional porous hydroxyapatite (UDPHAp) has a porosity of 75% and a unique microstructure consisting of oval pores (diameter 100-300μm) that penetrate through the material. UDPHAp also has the initial compression strength of approximately 14MPa parallel to the unidirectional pores. Furthermore, it possesses good osteoconductivity as shown by its implantation in certian animal experiments. The objective of this study was to evaluate the clinical and radiological outcomes with the use of UDPHAp as a bone substitute for tibial plateau fractures. Two patients (27-year-old male and 68-year-old female) suffering from a depression type of lateral tibial plateau fracture underwent the operation. Granule-type UDPHAp was filled and pressed into the bone defect and internal fixation using screws was performed. Partial weight bearing was allowed after 6 weeks. Radiological assessment was based on X-ray and CT taken 1, 3 and 6 months after the operation. Bony union was achieved and UDPHAp showed no complications associated with the use. In conclusion, we think that UDPHAp is useful as a bone substitute for clinical situations.

36 **15h 44T. TAMAKI, K. OINUMA, H. SHIRATCHI, S. IIDA, K. AKITA Anatomical study of the short external rotator muscles**1) Funabashi Orthopedic Hospital2) Matsudo City Hospital3) Unit of Clinical Anatomy, Graduate School, Tokyo Medical and Dental University

The direct anterior approach is a minimally invasive technique employed in total hip arthroplasty. To prepare the femur for prosthetic implantation, it is important to release the posterior capsule from the greater trochanter. However, whether any other tendons of the short external rotator muscles are damaged during posterior capsular release is not known. In this anatomical study, we investigated the insertion of the short external rotator muscles over the greater trochanter and the intrapelvic portion of the obturator internus muscle. The obturator internus tendon runs anterior to the piriformis and inserts into the medial aspect of the greater trochanter. The piriformis tendon runs posterosuperiorly to the obturator internus tendon, and the obturator externus tendon runs posteroinferiorly to it. The insertions of the short external rotator muscles are quite variable. The obturator internus originates from the medial surface of the obturator membrane and the margin of obturator foramen. The levator ani originates from the obturator fascia and supports the viscera in the pelvic cavity. We conclude that the piriformis and obturator externus tendons, which run posterior to the obturator internus, can be preserved during posterior capsular release if we focus on avoiding damage to the obturator internus tendon. The obturator internus may influence the function of pelvic floor organs, especially the urogenital function.

37 **15h 52 T.SUSUKA, M. MATSUURA, T.KURODA, M. ITOKAZU, T. MIYACHI, K.KATUKI Minimally invasive surgery-hemiarthroplasty (MIS-HA) for femoral neck fracture. Comparison between direct anterior approach and postero lateral approach**
Department of Orthopaedic Surgery, Osaka-City General Hospital,

In Minimally Invasive Surgery-Hemiarthroplasty (MIS-HA), direct anterior approach (DAA) is a muscle splitting approach that can avoid muscle damage during operation and can accelerate post-operative recovery. We previously used the posterolateral approach(PLA) with muscle dissection. We started using DAA in 2009 with a trial technique of bipolar hemiarthroplasty in DAA.

The objective of this study was compare results in (DAA-HA) and (PLA-HA). Methods : Our trial technique of bipolar hemiarthroplasty is separation of inner-head and outer-head. MIS-HA has been performed on a total of 48 hips; 22 hips belonged to DAA group and 26 hips to PLA group. We evaluated mean operating time, mean blood loss, length till walking by T-cane, and complications.

Results : The mean operating time was 113.2(67-163)min in DAA group and 119.9(83-227)min in PLA group. The mean blood loss was 250.6(100-470)g in DAA group and 400.8(100-770)g in PLA group. The length till walking by Walker was 6.8(5-8)days and 8.5(5-13)days in PLA group.

Conclusion : There was no difference in mean operating time and complications. DAA group had significantly lower blood loss and significantly shorter length till walking by Walker. It should be considered as one of the alternative approaches for MIS-HA

16h30 Session 4

Modérateurs 1 Pr P MERLOZ (Grenoble) 2 Dr Y. SEMOTO (Shiga)

38 **16h 30 J.M. VITAL, I. OBEID, J.S. STEFFEN EOS system and spine diseases** Spinal Unit 1 , Tripode Hospital , Bordeaux , France)

EOS is a new imaging system that permits the simultaneous acquisition of frontal and lateral X-rays of the whole body (from the head to the feets) or a local anatomical area at the same time as it reduces the X-ray dose by around 90% compared with a conventional system .

It's a very interesting technique to evaluate the deformities of the spine .

The minimally irradiating character of the machine naturally guided the initial development of software toward the management of idiopathic scoliosis, which requires repeated radiography and most often affects children and teens.

Spinal deformities can now be studied in a standing, weight-bearing position, on radiographic images that are of equal quality over the entire spine, thereby strongly reducing the problems of over- and under-exposure, especially for profiles .

Moreover, 3D models automatically calculate not only the standard frontal and sagittal balance parameters but also the axial rotation of each vertebral level, in a weight-bearing position.

The global sagittal balance can be evaluated completly due to the assesment of pelvic and knees positions .

Pre-operative calculation for corrective osteotomies are also facilitated by EOS system .
We propose to illustrate these advantages with illustrative clinical cases collected since 3 years in our Spinal Unit .

39 **16h 38 O. GILLE Transspinous fenestration of the lumbar spine**

Spinal Unit 1 , Tripode Hospital , Bordeaux , France)

Report of our mini invasive technique of spinal stenosis decompression through a transspinous approach. Our goals in this study were to evaluate the efficiency of this technique and to compare the muscular injuries sustained in contrast to classic surgical approaches.

Description of our technique: The first step is to measure, before the surgery, on preop MRI, the length of the spinous process of the superior adjacent level.

After incision of the superficial tissues, the second step is the spinous process osteotomy using a straight osteotome. We do the osteotomy of the distal half of the superior spinous process. For example for a fenestration of L4L5 level we do an osteotomy of the distal half of L4 spinous process. It is a median sagittal transspinous osteotomy, until the base of the spinous process. A security marging of 30 mm is left, using preop measurement, with a landmark placed on the osteotome, to avoid canal violation.

Then the junction between the lamina and the spinal process is osteomized in both sides with a small curved osteotome from the inside of the already made osteotomy. A spreader is then placed between the two residual parts of the spinal process. A curved osteotome is used to do the osteotomy of the distal part of the superior lamina. The fenestration is then made in a classical fashion under visual enhancement and proper lightening.

For fifteen patients operated by this mini-invasive trans spinous process fenestration we do a MRI study to assess the quality of the decompression and the muscles changes. A preoperative MRI was performed the day of the surgery and three months postoperatory using the same machine and the same protocol.

The spinal canal area was measured by surrounding the canal at the most stenotic level on the preop MRI and at the corresponding level on postoperative MRI.

The preoperative spinal canal area was 0.8 cm^2. Cross section area of the spinal canal lesser than 1 cm is highly correlated with neurological symptoms.

Postoperative spinal canal area is dramatically increased to 2.5 cm^2.

In the same manner we measured the contractile component cross-section area of the multifidus and longissimus muscles on T1 sequences. Visual assessment shows no muscle changes when we compare preop and postoperative MRI. We surrounded the multifidus and longissimus muscles and quantify the CCSA.

Following a transspinous approach, the contractile component of the erector spinae muscles decrease less than 5%. This value must be compare with the decreasing of 25% with conventional surgery.

In conclusion, this technique offers lots of advantages: the skill is simple, there is minimal soft tissues injury, time surgery is short, the surgeon has an excellent working space and visualization, less bleeding and probably less postoperative pain.

The limit of this technique could be the difficulty for repairing a dural tear.

40 **16h 46 A. KIN, I. BABA, A. NAKANO, K. FUJIWARA, M. KINOSHITA Posterior spinal shortening surgery for vertebral body collapse due to osteoporosis.**

Department of Orthopedic Surgery, Osaka Medical College

[Objective] To evaluate the efficacy of posterior spinal shortening surgery with pedicle screw instrumentation for osteoporotic vertebral body collapse.

[Methods] Nineteen consecutive patients who underwent posterior spinal shortening surgery for osteoporotic vertebral body collapse (mean age, 69.6 years; 8 males, 11 females) were retrospectively evaluated (surgical invasiveness, postoperative complications, clinical symptoms and radiological findings). Mean observation period was 20.6 months (6-71 months).

[Results] There were no major postoperative complications. Mean visual analogue scale of pain was improved from 87 to 24 mm postoperatively ($p=0.0000$). Mean JOA score was improved from 5.1 to 15.9 points postoperatively ($p=0.0013$). In radiological findings, the angle of local kyphosis decreased from 37.1 to 19.0 degrees ($p=0.001$). In five patients, instrumentation failure occurred before bony fusion was obtained, a revision surgery was necessary in two patients consequently.

[Conclusion] Osteoporotic vertebral body collapse accompanied with pain and neurological abnormalities has to be surgically treated by decompression of the neural tissues and reconstruction of the spinal column. In this study, clinical and radiological results of posterior spinal shortening surgery were good on the whole. However, in order to prevent instrumentation failure, instrumentation using not only pedicle screws but also others seemed to be needed.

41 **16h 54 R. MOMOMURA, A.YASUHISA, I. YNEZAWA, T. OKUDA, H. NOJIRI, O. MUTOU, K. KANEKO Experience of spinal fixation using ultra-high molecular weight polyethylene cable** Department of Orthopaedic Surgery, Juntendo University* Department of Orthopaedic Surgery, Tobu Chiiki Hospital

Introduction: The multistrand cable, now commonly used in various spinal fixation, has come to be recognized as a serious drawback leading to various postoperative complications. So to overcome the shortcoming of the multistrand cable, the ultra-high-molecular-weight polyethylene cable has lately come to be used widely in Japan.

Methods: In our hospital, we mainly use the cable for surgery of the atlantoaxial subluxation secondary to rheumatoid arthritis, scoliosis (idiopathic, symptomatic, congenital and paralytic), tumor and so on. We performed the operations using the cable on 36 patients of atlantoaxial subluxation, 60 of scoliosis, 2 of tumor and 5 of other diseases between 2002 and 2010 at our institution. In case of atlantoaxial subluxation, we have formerly used the cables according to Brooks procedure with Magerl procedure, lately, according to Luque procedure. In case of scoliosis, the cables are inserted through under some laminas, and tied with the lod. (Sublamina wiring) The cables are slowly tightened by the tighting gun up to the target torque strength dialed on its gauge.

Result: There is no complication associated with this cable system. The cable should be an excellent material for various surgeries. However, this remains be corroborated with lager and longer studies.

42 **17h 02** **I. YUGUE, K. SHIBAD, T. UETA, T. MAEDA, E. MORI, O. KAWANO**
Analysis of the rik factors for severity of neurological status in 238 patients with thoracolumbar and lumbar burst fractures Department of Orthopaedic Surgery, Japan Labour Health and Welfare Organization Spinal Injuries Center

Introduction: The correlation between spinal canal stenosis due to bony fragments and the severity of neurological deficits in thoracolumbar and lumbar burst fractures remains controversial. The obvective of this study is to determine the risk factors that have a significant correlation with the severity of neurological impairment in thoracolumabr and lumbar burst fractures.

Patients and Methods: A review of the clinical data (neurological impairments on admission and a finding of posterior ligamentous complex disruption at the time of operation), axial computed tomography and plain lateral radiography of 238 patients in thoracolumabr and lumbar burst fractures was performed retrospectively. The factors related to neurological impairments were analyzed using a multiple logistic regression model.

Results: In all cases, both the spinal canal stenosis ($p<0.01$) and disruption of posterior ligamentous complex ($p<0.01$) were significant risk factors. Interestingly, these two risk factors varied according to the injury levels; at thoracic level, the spinal canal stenosis ($p<0.01$), at the first lumbar spine, the disruption of the posterior ligamentous complex ($p<0.01$) and at the lumbar spine below L2, both of the spinal canal stenosis ($p<0.01$) and the disruption of posterior ligamentous complex ($p<0.05$) were significant risk factors respectively.

Conclusions: In the patients with thoracolumbar and lumbar burst fractures, the significance of the two important risk factors related to clinical results, namely the stenosis ratio of spinal canal and the disruption of posterior

43 **17h 10 S. RUATTI, P. MERLOZ, A. BODIN, J. TONETTI, A. EID, J. TROCCAZ, M. MILAIRE, N. MAISSE 3D Fluoroscopy-based navigation system in spine surgery and in ilio-sacral joint osteosynthesis. Preliminary results** (1) University Department of Orthopaedic and Trauma Surgery, CHU A. Michallon, 38043 Grenoble cedex, France Equipe GMCAO – Laboratoire TIMC/IMAG (Université Joseph Fourier – CNRS UMR 5525), Institut d'Ingénierie de l'Information de Santé, Faculté de Médecine, 38700 La Tronche

Background: With the use of pedicle screws in spine surgery or in Ilio-sacral percutaneous screwing, the complications associated with misplaced screws are mostly neurovascular, or mechanical (failure of the implantation). To increase accuracy of screw placement surgeons used CT-based navigation or virtual fluoroscopy systems. Compared with conventional manual insertion these new technologies showed an increase of the accuracy of pedicle screw insertion (less than 10 % of the screws are misplaced screws with CAOS techniques *versus* more than 30 % with conventional techniques). Both technologies have drawbacks: CT-based navigation require a registration step between CT data and intra-operative images which is not obvious to perform and virtual fluoroscopy provide only 2D images.

Introduction**:** The purpose of this study is to compare rates of screws misplacement between conventional manual insertion and computer-aided insertion by using of an intra-operative CT-imaging system (3D images) combined with a navigation device. This work was done with two types of surgical procedure: Ilio-sacral percutaneous screwing and spine surgery (pedicle screws or/and vertebroplasty needles). This work is a prospective, randomized, simple blind and comparative study and we show a preliminary report.

Material and Methods: From December 2010 to January 2011 instrumentation using screw fixation or vertebroplasty needles was performed: in a first group (group A), a navigated surgical procedure (intra-operative CT-imaging (3D) system combined with a navigation device) was carried out with 10 patients (54 instrumentations); in a second group (group B), a conventional surgical procedure (manual insertion and use of conventional C-arm) was performed with 6 patients (32 instrumentations). All patients were randomized into one of the group before surgery and they did not know which kind of procedure was using until the third post-operative day. For all interventions, we noted time of surgery and radiation running time for each instrumentation or vertebra level. Evaluation of screw placement in every case was done by two independant radiologists using plain X-rays and post-operative computer tomography scan. Radiologists used the Fu's criterias to decide if implants are in right position or not. The inclusion was over after the seventh post-operative day. It allowed us to check all the potential post-operative usual complications: deep vein thrombosis, hematoma, neurological or vascular signs, operative site infection.

Results: For pedicle screws, a 5 percent of cortex penetration (according to Fu's criterias) occurred in the computer assisted (A) group (3 screws). A 13 percent of cortex penetration occurred in the conventional surgery (B) group (4 screws). The mean radiation running time in group A reached 10 s for each vertebra level (2 screws) against 11.5 s in group B for one level. The operative time for two screws on the same vertebra level reaches 10 min on average (6.66 to 24.5 min) in the non computer-assisted (B) group and 11.9 min on average (5 to 24.5 min) in the computer-assisted

(A) group. This appeared to be non significant data ($p > 0.05$).

For Ilio-sacral procedure, we compared, 2 patients in group A (2 screws) and 1 patient in group B (1 screw). There were no extra-bone implantation in both groups. The operative time was 29 min on average in the computer assisted (A) group and 25 min in group B. The mean radiation running time was 11s in group A, compared to 30s in group B.

Discussion: Transpedicle screw insertion can cause three times of complications: neurologic, vascular, and mechanical. Neurologic and mechanical complications are mainly attributable to orientation errors. For instance, pedicle screw perforation of the lateral cortical bone often leads to rigidity failure of the osteosynthesis, and it is obvious that perforation of the medial, caudal, or cranial cortical bone often leads to neurologic disorders. Literature reports results ranging from 15 to 40 per cent misplaced screws, for the conventional technique, varying by pathology and type of postoperative evaluation (CT or X-ray only). In this current study, 3 of 54 (5 per cent) pedicle screws were considered to be misplaced when using three-dimensional (3D) fluoroscopic navigation. It is well known that the computer-assisted procedure can be a little time consuming, as reported by *Fu* and al. The main reasons for time increasing are set up, reference frame attachment, and data acquisition. The learning curve of the surgeon may decrease significantly this time. The mean radiation running time in group A is not significantly lower than in group B. But it has to be linked to the lower rate of extra pedicle screws, compared with non computer assisted surgery group. For Ilio-sacral screwing (2 in group A and 1 in group B) a statistical analysis was not meaningful in this small series.
The present study needs more patients to be statistically significant.

44 **17h 18** **R. SADDIKI, S. AUNOBLE, , F. SIBILLA, N. PELLET, J.C. LE HUEC**
Peri-opertive CT scan and navigation enhance safety of complex spine surgeries ,
Univ Bordeaux, Dept chir rachis 2, Bordeaux, France

Navigation in spine surgery started 10 years ago with the technology of surface recognition followed by fluoronavigation and fluoro-merging but the poor accuracy was not compatible with spine surgery.The main disadvantage of the pre op acquisition for the spine is that the péri opérative positioning of the patient is not in lying condition but in prone position for a lot of cases. For those reasons a péri operative acquisition of the CT scan, with the patient on the table, is the best and accurate imaging system. The combination with the navigation reference frame fixed on the patient provides the best situation.

Material and method : The O arm is an open CT scan, allowing péri operative acquisition combined with the Medtronic navigation system. This allows to navigate upper cervical spine for C1C2 screw fixation using the Dutoit or Magerl's techniques. For thoraco lumbar and pelvis screw insertion the CT O arm acquisition is limited to 5 or 6 vertebrae according to vertebra size.

Results: Our experience is today: 88 procedures for complex spine procedures: scoliosis (48), Posterior wedge osteotomies (32), and tumor resections (8). During the surgery it is possible to control implant positioning, tumor margin resection, importance of osteotomy correction. All patients were operated with motor and evoked potential control. No neurologic trouble were detected peri and post operatively. Time for CT acquisition is an average of 8,4minutes (6 to 15 mn). For those complex cases the operating time was decreased by 18% compared to a previous similar series without CT Oarm navigation guidance.

Discussion: The patient radiation is equivalent to 2/3 of a normal CT, but the main advantage for the medical team and nurses is that the radiation for them is nil. The absence of radiation for the medical staff and the High accuracy for implant positioning or tumor removal is the best arguments to support this technique.

45 **17h 26 P. FERNANDEZ Nuclear medicine in osteoarticular disorders : new tracers and multimodal imaging** Dept of Nuclear medicine and University Bordeaux Segalen Bordeaux

Today, new advances in both imager technology than new tracers have revolutionized nuclear medicine. On musculoskeletal disorders,although the classical bone scan with diphosphonates labeled with technetium-99m remains the basic examination in the field, the addition of a CT acquisition coupled with the scintigraphic acquisition, with the development of hybrid imaging, offers unmatched precision by improving the diagnostic parameters. The development of new tracers in single bphoton emission computerized tomography (SPECT) or in position emission tomography (PET) can also improve the specificity of these explorations. For example, radiolabeled white cell scintigraphyn or scintigraphy with specific antibodies in the diagnosis of peripheral osteoarticular infections, or even the contribution of PET with [18] F-FNa with a significant gain in terms of sensitivity, specificity and spatial resolution. If oncology has benefited primarily the considerable development of hybrid imaging SPECT or PET –CT, explorations in musculoskeletal diseases now benefit from this technological progress in parallel with the development of more targeted tracers.

46 **17h 34 R. KOSAKA, T. HONINOUCHI, M. HATTORI The limitation of magnetic resonance imaging in diagnosis of infectious vertebral osteomyelitis** Department of Orthopedic Surgery, Hirakata City Hospital

Magnetic resonance imaging (MRI) has been regarded as a gold standard in imaging modalities for diagnosis of spinal infections. Recent reports revealed a few cases fail to present typical MRI findings in early phase of the disease, and spend long term to a diagnostic decision and the initiation of treatment. I retrospectively reviewed clinical data among 14 cases of infectious spondylitis treated in our institute and examined influencing factors for diagnosis delay. Diagnosis include 2 Tb and 11 bacterial spondylitis, and the type of onset was classified to 4 subtypes; acute in 7, acute-on-chronic in 4, subacute in 2 and chronic in 2. On MRI performed during 2 weeks on average after initial visiting, 9 patients presented typical findings of spondylitis including low-signal changes on T1-weighted image in the vertebral bodies around the involved disc, however, MRI revealed no definite abnormality in 5 patients (35.7%). MRI taken after 5 weeks from first visiting showed positive findings in all patients. Patients whose onset type was acute tended to take the first MRI earlier after visiting and to present negative findings on MRI ($p=0.02$). Period to definite diagnosis of spondylitis was significantly lprolonged in patients with negative findings on first MRI (31 days) compared to those with positive findings (12.1 days) ($p=0.04$). Great care should be paid for patients presenting acute back pain and laboratory abnormalities even with negative findings on first MRI, and repeated MRI is considered at least 2-3 weeks later.

Saturday 8h00 session 5

Modérateurs 1 Pr P.MERLOZ (Grenoble) 2 Pr Y. TANAKA (Nara)

47 **8h 00 K. NAKATA, A. NISHIIKE, J. NSHIIKE, O. NISHIIKE A case of a collapsed hospital in Japan: two year trial of thr orthopaedic department**1) Kushiro-sanjikai Hospital & Kosuga Clinic2) Kushiro-sanjikai Hospital

The recent collapse of the health care system in Japan is especially striking in the rural districts, where many doctors migrate to the cities. Many public hospitals reduce several departments and some hospitals collapse indeed; therefore many patients with orthopaedic disorder become medical refugees in the countryside. For example, some patients travel 2 hours to get to the hospital for the treatment of rheumatoid arthritis, and other patients with osteoarthritis have to wait several years for total knee replacement arthroplasty.

Two years ago our hospital re-opened instead of the collapsed semi-public hospital in Hokkaido in northern Japan, where this collapse is most serious. The former hospital had the departments of internal medicine and general surgery, but our hospital specialised in both orthopdaedics and cardiology. Now the skilled team of orthopaedic surgeons, clinicians and allied health professionals provide the appropriate surgical and post-surgical care. Regularly the part-time orthopaedic surgeons visit once or twice a month from the city, who have their own specialities, including spinal, hand, endoscopic surgery and rheumatology. Orthopaedic procedures at our hospital include total hip and total knee replacements, rotator cuff repairs, carpal tunnel and trigger finger release, back and neck surgeries. Our two-year trial to regenerate the health care system in the country is reported here.

48 **8h O8 E. CAVEIGNAC, A. ESPIE, P. CHIRON, N. REINA, JM. LAFOSSE Quelle est la meilleure incidence radiographique pour faire le diagnostic d'un conflit femoroacetabulaire** Toulouse Rangueil

Since the 2008 AAOS symposium, Hip Imaging should include specific lateral radiographs : Frog Leg or Dunn or Cross table views. We use an original view (described by Chiron) for the diagnosis of cam femoroacetabular impingement. The patient is installed lying supine; hip in 45°flexion, external rotation and 45° abduction. X-ray beam should be perpendicular to the table with the crosshairs directed on the femoral head.

Objective : To compare our incidence with the three above mentioned . The principal evaluation criteria was Alpha Angle (Notzli) ; the second was the Anterior Offset Ratio (Eijer)
Methods : Cadaver study : we created artificial cam femoroacetabular impingement on normal femoral necks. Femurs were positioned at several angles using orthogonal landmarks. The number of cases necessary to show a 5° difference between the tested view and Dunn view was 19. Validity (Spearman correlation rate with Dunn view) and reproducibility (intra class correlation coefficient) were analyzed with Stata SE v11.0

Results : 19 femurs were included. The highest mean values of alpha angle were obtained with our view, the lowest with the Crosstable. We measured a mean difference of 8.95° with Dunn (p=0.00007), 3,44° with Dunn 45° (p=0.004) and 13.47° with cross table (p=0.002). The intra and inter-observer variability were both excellent (0.99 and 0.87). Spearman□ s correlation rate with Dunn view was r=0.7. Results concerning Offset Ratio were not statistically significant.

Discussion : Chiron□ s view is useful to detect mild abnormalities. Our screening of hip impingement now relies only on clinical examination and Chiron□ s view

49 **8h 16 Y. SEMOTO, I. KISHIMOTO, K. FUJIWARA Ultrasonography in the infant hip joint-clinical course of graft type IIb** Imazu Hospital, Director of Pediatric Orthopedics and Scoliosis Center, 87-1 Minamishinpo Imazu Takashima, Shiga, Japan Osaka Medical

(Aim) We assessed the clinical features of the hip joints of Graf type type IIb cases (157 hips) by radiograph taken after the age of one year.
(Method) We already reported that all type I hips developed to normal with the acetabular angle under 30 degrees.
(Results) For type IIb hips, ultrasonographic examinations were performed each month, and 113 hips out of 157 of type IIb changed to type I in one month, 19 hips improved to type I in two months, 6 hips improved in 3 months, 5 hips improved in 4 months, and 1 hip improved in 5 months. Ten hips were not confirmed to be normal by Ultrasonography. These ten cases were examined by X-Ray. Acetabular angles of 7 hips which did not improve to type I were under 30 degrees at the age of one year. Acetabular dysplasia were found in remaining 3 hips at the age of one year. Even in these hips normal acetabula developed by the age of five years. (Conclusion) All type IIb hips developed to normal by the age of five years

.

50 **8h 24 F. BONNEL, J. TEISSIER, JG. ASENCIO, C. BONNEL Measurement volumetry of osteolysis after shoulder, hip and ankle prothesis**

The whole concept of bone grafting in revision surgery demands clearly thought out principles and methods.The bone loss measurement by Xray was insufficient.

Methods

Our study was based upon the analysis of 3D reconstructions CT scan data of 25 patients. The real volumetry measurement was performed by a new software (Myrian* Intrasense). For each patient a CT scan was necessary and the contours of the osteolysis were mapped with slices each millimeters. At the end we obtained automatically the volume.The time for one case was ten minutes.

Results

The results will be exposed for each joint. The use of computed tomography as well as 3D imaging in osteolysis after prothesis may contribute to enlarge the knowledge and enhance the previous surgical possibilities for treatment of revision prosthesis. This new approach could be used without invasive technic to obtain information at different time after prosthesis when pain was present ; The precision of the measurement could show the little movement at the implant bone interface.

Conclusions

On a general point of view this methodology allowed to define the surgical technic with real volume necessary for bone graft.

51 **8h 32 J. KAMOGAWA, S. SHIRAISH The 3D-MRI/CT fusion imaging of the spinal nerve root disorders** Department Spine & Sports medicine, Shiraishi Hospital

Objectives We combined 3D-CT images of bone construction with 3D-MRI of both neural architecture using Workstations (1). We present herein some cases (LSCS, CSA,) in which noteworthy finding were observed about spinal nerve roots using this technique. Methods We used 1.5-T MRI, 4 slice CT and VINCENT software (Japan). The method for producing images was as follows. First, DICOM data from CT and MRI were transmitted to the workstation. Next, the Multivolume application on the workstation was used to create a 3D architecture from the respective CT and MRI data in the same space by the volume-rendering method. The position and rotation tool was used for sagittal, axial, and coronal positions in the respective virtual images, and adjusted manually. Cervical or lumbar nerve roots were segmented, and color was applied for visualization. Results By using this technique, we could evaluated unambiguous, 3D confirmation of the pathological state and courses of nerve roots, both inside and outside the foraminal arch of the spine, as well as thickening of the yellow ligament and the locations with bony spurs.
Conclusions The 3D-MRI/CT fusion imaging is very useful for spinal surgery. Virtual images have thus enabled the visualization of previously inaccessible anatomical locations and depiction in detailed images at a glance.

References 1. Yamanaka Y, Kamogawa J, Skeletal Radiol 2010

52 **8h 40 Y. HOMMA, P. HERNIGOU Stem cells and allograft for acetabular bone reconstruction in revision arthroplasty** University Paris East Creteil 94000, Juntendo University

Deficiencies of acetabular bone stock at revision hip replacement are usually reconstructed with allograft using impaction bone grafting and a reinforcement metal device. We have used in 20 patients a standard frozen irradiated bone allograft vitalised with autologous marrow prepared with concentration by centrifugation and compared the results with those of 20 other patients who received standard frozen irradiated bone allograft without stem cells. We looked also the results of 20 patients operated with hip dysplasia and received an autograft associated to their total hip arthroplasty. With a follow-up of ten years hips that received allograft vitalised with autologous marrow showed evidence of trabeculation and incorporation of the allograft with no acetabular loosening, compared with 7 failures in the other group with allograft without stem cells and 4 failures (graft resorption) in the group of patients with autograft. These results suggest that the use of an acetabular reinforcement ring and a living composite of sterile allograft and autologous marrow concentrate appear to be a method of reconstructing acetabular deficiencies which gives better results than allograft alone or autograft of the femoral head, at least in our experience. The question is how to improve the preparation of such a bone allograft vitalised with stem cells.
Material and methods: Femoral heads were obtained from patients with hips fractures. The allograft head was prepared using bone marrow aspirated from the iliac crest. Marrow was aspirated from both anterior iliac crests, concentrated on a cell separator, and then injected into the femoral head. The marrow was injected into the allograft several times until the bone block was saturated. Several tests were done with 10 cc, 20 cc, 40 cc. The aim of this study was to evaluate how many stem cells can be charged in an allograft femoral head during surgery and to provide indications of the number of these stem cells according to the method of concentration used for the preparation of the bone marrow. The number of progenitors cells that was transplanted was estimated by counting the Fibroblast Colony-Forming Units (FCFUs).

Results: In a normal femoral head the mean number of FCFUs is 33.5 (SD 21.7) per 10^6 bone-marrow cells. The volume of a femoral head is average 60 cubic centimetres. The number of progenitor cells is average 50 FCFUs per cubic centimeter, and the total number of FCFUs is average 3000 FCFUs in an autograft femoral head. In an allograft there are no stem cells before injection of bone marrow. The average volume of bone marrow that we were able to load in the allograft was 6 cc (range 4 to 8), whatever the number of bone marrow we injected in the femoral head and whatever was the method of injection (closing or not the femoral neck cut). Because bone marrow obtained by aspiration without concentration only contains a mean of approximately 600 progenitors per cubic centimeters (range 12 to 1224 per cubic centimeter, injection of 6 cc of bone marrow in an allograft femoral head will give an allograft with average 3600 progenitor cells, so the same number as in an autograft femoral head (50 FCFUs per cubic centimetre). The gold standard for a graft is a piece of bone coming from the iliac crest (600 FCFUs per cubic centimeter); our best results were obtained with allograft with bone marrow concentrate, so femoral head allograft and perhaps also femoral head autograft should be loaded with bone marrow concentration than can increase the

number of stem cells 5 or 10 times according to the device system used for concentration.

Discussion and conclusion: Autograft has been shown to be better than allograft in restoring bone stock because of its osteoconductive, osteoinductive and osteogenic properties. However, because autograft is of poorer quality in elderly patients and postmenopausal women, allograft is used extensively not least because of its ready availability and lack of donor site morbidity. However, allograft does have a number of disadvantages (lack of osteogenic cells and reduced osteoinductive factors). This study has shown that a sterile allograft-autologous marrow composite gives an identical clinical and radiological outcome, and can content after preparation more or an identical number of stem cells as an autograft. The allograft used in impaction grafting is not vascularised; it is therefore unclear how successful incorporation is achieved. Bone ingrowth can be encouraged by osteoinduction, osteoconduction and mechanical loading;

53 **8h 48 K. AOKI, H. AKAZAWA, M. NISHIMOTO, K. ODA, C. HONDA, K. KINUGASA The orthopaedic surgical approach for the lower extremity contracture with spastic paralysis in patients with the prolonged consciousness distribance due to the brain damage caused by the traffic accident**1) Asahigawaryouikuen2) Okayama Ryogocenter

In Japan, 725773 traffic accidents happened and 4863 persons died, in 2010. The number of persons with very severe residual disability, including the prolonged consciousness disturbance, has increased, although the number of the dead has decreased. The rehabilitation for these patients is not enough. The National Agency for Automotive Safety & Victims' Aid (NASVA) provides the intensive medical care using 262 beds in six hospitals. These days, the dorsal column stimulation, although it is not covered by the health insurance, has enabled patients' consciousness to recover. But still, the contracture of extremities remains and that makes it difficult to sit and stand without support. Since Sep. 2008, we have performed surgeries for patients, referred from the Okayama Ryogocenter, which is the one of the NASVA's hospitals. The deformities, mainly the equinovarus and the knee contracture, in 10 patients were operated. The average age at the time of the surgery was 23 years and the average duration after the accident was two years and seven months. Patients' sitting and standing condition improved. The average one year and seven months after the surgery, the NASVA's score, which consists of 60 points and reflects the condition of the prolonged consciousness disturbance, improved from average 49 to 24 points.

54 **8h 56 A.WASEDA, Y.SUDA, N. USAMI, Y. TOYAMA Arthroscopic treatment for the posterior ankle impingement syndrome. Short term follow up** Department of Orthopaedic Surgery, Keio University School of Medicine, ** Shiseikai 2nd Hospital, The Institute of Shoes, Foot and Ankle Disorders

Purpose: Purpose of this study is to investigate the results that we performed the arthroscpic treatments for the patients diagnosed of the posterior impingement syndrome (PIS) of the ankle joint.
Materials and Methods: The materials were eight ankles in seven cases, three males and four females, diagnosed of the PIS of the ankle who were treated arthcoscopically from 2008 through 2011. The ages were 13 to 62 years old with an average of 39 years old. The cases were four ankles that had pain after sprain, one after ankle fracture, and three unknown. Synovectomy was performed arthroscopically in all cases, removal of talus postero-lateral process or os trigonum in five cases. We analyzed the JSSF score and VAS score before and after this procedure. An average of the follow-up period was nine months. Results and Conclusions: On average, the JSSF score was 61 pre-operatively and it increased to 92 post-operatively, and the VAS score was 75, it decreased to 18. We found the reduction of the pain in all cases. But one case still had pain on her ADL who had longitudinal tear of FHL. Although the arthroscopic treatment is less aggressive, if there is pathology, one should repair it.

55 **9h 04 Y.TANAKA, K.KADONO, A.TANIGUCHI, T. MATSUDA, S.KAMIJO, T.KUMAI, Y.TAKAKURA, H.OHGUSHI Total ankle arthroplasty with tissue engineer technique**

Department of Orthopaedic Surgery, Nara Medical University

Objectives: To enhance early bonding of an implant to bone, we devised a method of seeding the implant surface with bone marrow mesenchymal stem cells that differentiated to osteoblasts and bone matrix prior to implantation. A comparative study was made between results of tissue-engineered technique and those of conventional marrow mounding technique.

Materials and Methods**:** The arthroplasties using alumina ceramic prostheses were performed for 39 ankles in 38 patients with osteoarthritis. All the patients except one died patient could be investigated an average of 41 months postoperatively. Twenty-two ankles in 21 patients (4 male and 17 female, 54-78 years, mean 67 years; TE group) were operated using tissue engineered technique. Sixteen ankles in 16 patients were used marrow mounting technique (4 male and 12 female, 55-85 years, mean 67 years; M group).

Results: Mean values of the AOFAS hindfoot score were improved from 44 points to 87 points in the TE group and from 45 points to 78 points in the M group. The postoperative value in the TE group was significantly higher than that in the M group. The bone bonding rates were 56 % and 48 % in the TE and M groups.

Conclusions: This is the first series of a clinical use of mesenchymal stem cells for artificial joints. Tissue engineered total ankle arthroplasty could be performed safely and produced the satisfactory short-term results.

56 **9h 12 D. CHAUVEAUX, O.LAFFENETRE, V. DARCEL, N. POMMIER, A. ROUX**
Contribution of tendinoscopy in ankle tendon disease : premiminary analysis of 57 cases University Hospital Bordeaux, France

Aim : Endoscopy provides an attractive alternative to open surgery for diagnostic and therapeutic purposes in patients with ankle tendon disease. Early work was published by Van Dijk in 1994
Materials and methods : fifty two patients (mean age 40,8, range 14-74 years), 45 with post-traumatic lesions, underwent 57 tendinoscopy procedures using a slightly modified technique with a 4.5 optical The procedures, conducted under general anaesthesia, were performed to explore fibular (n = 37), posterior tibial (n = 17), anterior tibial (n = 3) tendons. Prospective follow-up was at least twelve months (12-84). Preoperatively, all patients presented more or less localised pain with signs of tendon suffering. Forty-eight had undergone prior explorations (ultrasound = 36, MRI = 33) which had not revealed any anomaly in seven..
Results : Peritendinous adherences were observed intra-operatively in 52 cases with inflammatory reactions requiring resection in 46. A lesion of the tendon itself was found in eighteen cases-fissure (n = 6), superficial dilacerations (n = 8), induration (n = 2), strangulation (n = 2) which required specific cure with forceps or motorised instrumentation. No explanation of the pain could be identified in two patients. Postoperatively, 45 patients achieved complete pain relief which persisted for at least one year. At last follow-up, three patients have not been reviewed, thirty were totally pain free and eight had developed associated symptoms (cracking, swelling). Overall, twenty patients were very satisfied, eighteen were satisfied, six were disappointed, and five were dissatisfied (no improvement). There were no signs of worsening and only one complications directly related to the method (sural nerve transitory lesion)

Conclusion : These results of early experience in France are less satisfactory than those reported by Van Dijk who had 80 % good results for 85 tendinoscopic procedures in 70 patients. They do however confirm the usefulness of this technique for the management of patients with tenosynovitis, adherences, and partial ruptures of the ankle tendons which cannot always be identified with classical imaging techniques. Definitive evaluation will require analysis of a larger series of well selected patient
.

57 **9h 20 T.INOUE, N.IKARI, T.TOIHATA, M.TODOROKI Distal lineal metatarsal osteotomy for hallux valgus** Department of Orthopaedic Surgery, Hakujyuji Hospital.

Purpose] Distal lineal metatarsal osteotomy (DLMO) is one of the minimum invasive surgeries for hallux valgus. To make this method of treatment better and safer, we investigated our results of DLMO.
[Materials and Methods] From 2008 to 2010, we performed DLMO for seven feet of 4 cases with hallux valgus. One case was male and three cases were female. The age at surgery was from 33 to 60 years of age. The follow-up period was from 8 months to 26 months. We investigated the factors for the poor results and the pitfalls of this osteotomy.
[Results] At final follow-up, four feet were excellent or good, but three other feet had some problems. One of the problems was the contracture of the first metatarsophalangeal joint. The cause of the contracture was prolonged external fixation for the delayed union of the osteotomy in one case, and pin tract infection in another case. The other problem was the bone necrosis of the first metatarsal head after the osteotomy.
[Conclusion] DLMO for hallux valgus is a good and minimum invasive method, but it is necessary to avoid complications.

58 **9h 28 O. LAFFENETRE, P.CARRET, V.DARCEL, D.CHAUVEAUX Treatment of moderate hallux valgus percutaneous chevron: a preliminary report of 56 feet with a one year follow up** Bordeaux - FRANCE

Introduction The goal of this study is to present the use of percutaneous chevron as a new approach in the treatment of moderate hallux valgus. Material and methods It was a continuous single-surgeon series concerning 56 feet (45 patients) with a mean age of 49, operated between May 2008 and June 2010. The mean clinical and radiological follow-up was 12.5 months. It concerned exclusively painful moderate deformations, triggering difficulties to put on shoes. All forefeet had metatarsal index plus or plus minus. The classical clinical and radiological assessments were conducted before and after the surgery : they included type of forefoot, range of mobility, functional Kitaoka forefoot scale, subjective rate (very satisfied, satisfied, disappointed, dissatisfied) and evaluation of IMA, DMAA, DM2AA, HVA, IPA and metatarsal index. Results43 patients were very satisfied with their result, 11 were satisfied, one was disappointed and one was dissatisfied. The functional Kitaoka score went from 63.5 pre-operatively to 96.9 post-operatively. Concerning the range of motion, the mean dorsiflexion went from 83.3° pre-operatively to 84.1° and the mean plantar flexion went from 16.8° to 16.6°. We also noted a statistically significant decrease of HVA from 26.5° to 9.5°, of IMA from 12.1° to 8.1°, from 12° from to 7.6° for IPA, and from 12.8° to 7.6° for the DMAA at the latest follow-up. A first phalanx osteosynthesis was performed in 24 cases when the lateral cortex was broken. We noted 15 removals of the screws and one case of delayed cicatrisation with a satisfying outcome. The real complication was a transfert metatarsalgia of the 2^{nd} shaft in 5 cases (9%). Discussion Thanks to a reproducible technique and after a short learning-curve, the clinical and radiological parameters were statistically improved. The main advantages are a better post-operative mobility very quickly without stiffness and the cosmetic aspect which is very aesthetic among the female population, conserving a natural relief of the metatarsal head. Furthermore, a majority of patients were operated in a day care surgery. Conclusion Despite a short follow-up, preliminary results of this new percutaneous approach are encouraging and this correction combines reliability and reproducibility. This technique, which is performed without tourniquet, most of the time in a day care procedure gives regularly an excellent mobility. The use of an appropriate osteosynthesis device will allow surgeons to free themselves from the difficulties of positioning the screws, which is the biggest challenge of this procedure.

59 **9h 36 J. AMEDEE VILAMITJANA Bone regeneration and tissue engineering: a challenge for clinical application** INSERM U1026, Université Bordeaux Segalen,Bx

Tissue engineering applies methods from materials engineering and life sciences to create artificial constructs for regeneration of new tissue. One common approach is to isolate specific cells from a patient to grow them on a specific matrix under controlled culture conditions including dynamic conditions. The response of host organism in macroscopic, cellular and protein levels to biomaterials is, in most cases, closely associated with the scaffold properties. Then, in tissue engineering, regenerative medicine and many other biomedical fields, considerable efforts have thus been focused on the development of bioactive scaffold with abilities to promote cell adhesion, proliferation and to maintain cell functions.
In addition, the use of autologous adult stem cell for building a tissue engineered construct offers now a great potential for increasing the biointegration of this construct in large bone defect. Clear characterization of the chemical compositions and physical structures of the biomaterial surface had profound scientific importance, leading to insight understandings of cell–biomaterial interactions.
Despite a highly documentated basic and preclinical research for tissue engineered construction and cues for 3D regeneration, the clinical studies of tissue enginereed constructs with autologous stem cells remain limited.
The human MSCs can fail to produce clinically relevant amounts of bone while MSCs from other species (animal sources) convincingly generate sufficient bone volume. However, identification of a donor having cells with good osteogenic potential still poses a major hurdle for clinical application with regards to the older populations. The development of an osteoinductive, osteoconductive material, without any living cells or growth factors should be another issue for regenerating bone that guaranties biosecurity and success for patients. The multidisciplinary research conducted by biologists, chemists, physicians, and clinicians progresses to both ways.

60 **9h 44 T. HOSHI, F. KOMATSU, H. NAKAJIMA, M.KOMATSU Arthroscopic management for localized pigmented villonodular synovitis of the knee joint: analysis of 6 cases** Komatsu Orthopaedic Clinic, 3245-1 Tsuda, Hitachinak Ibaraki

Objectives : Pigmented villonodular synovitis (PVNS) is an uncommon synovial proliferative disease. We report our experience of arthroscopic treatment in localized PVNS of the knee joint.
Methods : Based on the findings of the knee MRI, six patients (2 men and 4 women, mean age 42 yrs) were treated arthroscopically for localized PVNS of the knee joint in our clinic between 2004 and 2010. We reviewed patients' presenting symptoms and signs and also the feature and location of PVNS at surgery. We also evaluated clinical outcome and MRI evidence of recurrence. Mean follow-up period was 23 months.
Results : The presenting symptoms and signs were palpable mass (3 cases), intraarticular bleeding (3), pain (3) and foreign-body sensation (2). At surgery, the nodules (4 single, 2 multinodular) were found in the femoral notch arising from the anterior joint capsule (3), and at the suprapatellar pouch (3). The surface of the nodules showed purplish red (2) and yellowish brown (4). There were no complications, no recurrence after arthroscopic excisions.
Conclusion : Localized PVNS of the knee joint can be managed arthroscopically in selected patients based on the MRI findings. However, long-term follow-up is required despite the reported recurrence rates of 0 – 11%.

61 **9h 52 H. IHARA Postural control capability of ACL deficient knee after sudden tilting** Bone & Joint Center, Kyushu Rosai Hospital, Fukuoka, Japan

The loss of neurophysiological function in anterior cruciate ligament (ACL)-deficient knees leads to irregularities in neuromuscular coordination function, with any sudden change in circumstances believed to contribute to deterioration in postural control. The aim of this study is to investigate differences between ACL-deficient patients and healthy subjects through examination of postural control in response to perturbation. Twelve patients waiting for ACL reconstruction were compared with 12 healthy athletes. Subjects were instructed to stand in a bipedal stance on an unstable board which was then subject to sudden tilting from behind. Stepping power and reaction time of subjects to this perturbation were then measured through accelerometers attached to both the unstable board and the subjects' knees. From the results of the healthy athletes, stepping power was observed to be stronger on the tilted side than on the opposing side, while the athletes' step reaction, as part of anticipatory postural control, was found to be faster on the opposing side to the tilted side. In patients with ACL-deficient knees, however, the opposite was found to be true, with stepping power no stronger in the tilted side than the opposing side, while the step reaction was no faster in the opposing side than the tilted side. In postural control capability at the time of perturbation, both the affected and healthy knees of ACL-deficient patients were impaired as a result of the control patterns differing from the usual model.

10h30 session 6

Modérateurs 1 Pr P HERNIGOU (Creteil) 2. Pr Y. MATSUGUE (Shiga)

62 **10h 30 Y. MATSUSUE, M. KUBO, K. UENAKA, Y. NAKAGAWA Joint preservation for osteonecrosis of the knee by autogenous osteochondral graft transplantation. A new technique of eyeglass-plasty** Department of Orthopaedic Surgery, Shiga University of Medical Science, Otsu[1] Department of Orthopaedic Surgery, National Hospital Organization Kyoto Medical Center, Kyoto[2]

INTRODUCTION: We present a new technique (eyeglass-plasty) for large lesions and the middle-term clinical results of autogenous osteochondral grafting for osteonecrosis of the knee including steroid-induced osteonecrosis.
MATERIALS AND METHOD: Thirty-seven patients (40 knees) with at least 2-year follow-up periods were included in this study. The age ranged from 21 to 77 years of age, with a mean of 49. The follow-up period ranged from 24 to 165 months with a mean of 61. The cause of osteonecrosis was steroid-induced in 10 and idiopathic in 30. Correction osteotomy was performed in 23 knees at the same time of osteochondral grafting. The size of the osteochondral defect ranged from 180 to 1080 mm^2 with a mean of 462. The number of transplanted grafts ranged from 1 to 6 with a mean of 2.8. In steroid–induced osteonecrosis with unstable but intact articular cartilage on the necrotic lesion, the lesion is treated by multiple drilling and bone grafting through “cartilage windows” created OATS^{TM} instruments; then followed by two large osteochondral plugs transplantation into the “windows” (eyeplass-plasty).

RESULTS AND DISCUSSION: The clinical results by ICRS cartilage evaluation form were normal in 17, nearly normal in 22, and abnormal in 1 knee. The range of motion was normal except in three knees with a flexion of 135 degrees. Second-look arthroscopy revealed complete integration in two thirds of the cases and the others showed partially incomplete integration between the grafts. In cases with eyeglass-plasty for large steroid-induced osteonecrosis, osteointegration and remodeling of the necrotic lesion were obtained in MRI and the clinical results were nearly normal. Abnormal results were obtained in one patient with steroid-induced osteonecrosis who had avulsion of the remaining cartilage after transplantation.

CONCLUSION: Autogenous osteochondral grafting for the osteonecrosis of the knee gave a good knee function including full flexion and may avoid knee arthroplasty even in cases with steroid-induced osteonecrosis.

63 **10h 38 K. SATO, A. TSUCHIYA, I. KANISAWA, H. SHIRATSUCHI Patient education regarding anterior cruciate ligament reconstruction** Department of Rehabilitation, Funabashi Orthopedic Nishifuna Clinic Funabashi Orthopedic Hospital

Purpose Our hospital held educational lectures for patients before undergoing anterior cruciate ligament (ACL) reconstruction. The purpose of this study was twofold: to report the results of a questionnaire regarding the lecture, and to determine if the lectures were effective in reducing the rate of graft rupture. Methods Seven hundred fifty three patients underwent hamstring tendon ACL reconstruction in our hospital between 2005 and 2009, and participated in this study. Two hundred fifty six patients (127 men, 129 women) who attended the lecture were defined as the intervention group, of which 163 answered the questionnaire. Four hundred ninety seven patients (292 men, 205 women) who didn't attend the lectures were defined as the control group. Knee anatomy, operative procedure, and postoperative rehabilitation were explained in the two hour lecture. The rates of graft rupture were investigated and compared between the groups using the chi-square test. Results 98% of the patients that answered the questionnaire rated the lecture as useful or highly useful, and 95% were satisfied or highly satisfied. Graft rupture occurred in 9 patients (3.5%) in the intervention group, and 24 patients (4.8%) in the control group. No significant difference between the groups was observed. Conclusion The questionnaire showed the lectures useful and satisfactory for participants. However, whether the lectures were effective in reducing the rate of graft rupture was inconclusive.

64 **10h 46 T. MANABE, T. OHDERA, M. KATSUKI, A. KOBAYASHI Incidence and natural course of deep venous thrombosis after total knee arthroplasty** Fukuoka Orthopedic Hospital, Fukuoka

Patients indicated for primary total knee arthroplasty were prospectively evaluated with duplex ultrasonography to elucidate the incidence, timing, and evidence of expansion or reduction of deep venous thrombosis (DVT). Ultrasonographic screening was carried out for 59 consecutive patients on the first, third, seventh, fourteenth and twenty-first postoperative days. All patients were conducted prophylactic anticoagulant therapy using fondaparinux or enoxaparin for 14 days starting on the first postoperative day.

Over all, thirty-three patients (56%) were positive for fresh thrombi within 21 days, which were all asymptomatic. Fresh thrombi were found in twenty-eight of 33 (85%) patients on the first postoperative day, subsequently three on the third, six on the seventh, and one on the fourteenth. The incidences of DVT were 54% on the first postoperative day, 39% on the third, 42% on the seventh, 32% on the fourteenth, and 29% on the twenty-first, respectively. Expansion of DVT was found in one patient on the third postoperative day. In sixteen of 33 patients, DVT had disappeared within

21days, and had reduced or been unchanged in seventeen of 33 on the twenty-first postoperative day.Our study has shown that most of DVT formed within one day after surgery, and newly occurrence or expansion of thrombi was few afterward under anticoagulant therapy.

66 **10h 54 JY JENNY, FP. FIRMBACH, Y. DIESINGER, JY. SCHOENAHL Intra-operative analysis of the kinematic behavior of a total knee replacement by a navigation system. Initial experience and further development** Dep orthop surg University of Strasbourg

AIM OF THE STUDY: We developed a specific software derived from a clinically used navigation system to allow in vivo registration of the knee kinematics before and after total knee replacement. We wanted to test for the feasibility of the intra-operative registration of the knee kinematics during standard, navigated total knee replacement.

METHODS: The software measures the respective movement of the femur and the tibia, and specially antero-posterior translation and tibial rotation during passive knee flexion. Kinematic registration was performed twice during an usual procedure of navigated total knee replacement: 1) Before any bone resection or ligamentous balancing; 2) After fixation of the final implants. 200 cases of total knee replacement have been analyzed. Post-operative kinematic was classified as following: 1) Occurrence of a normal femoral roll-back during knee flexion, no roll-back or paradoxical femoral roll-forward. 2) Occurrence of a normal tibial internal rotation during knee flexion, no tibial rotation or paradoxical tibial external rotation.

RESULTS: 54% had a normal femoral roll-back during knee flexion after total knee replacement, 13% had no significant roll-back and 33% had a paradoxical femoral roll-forward. 65% had a normal tibial internal rotation during knee flexion, 16% had no significant tibial rotation and 19 had a paradoxical tibial external rotation.

CONCLUSION: It is possible to record the kinematic behavior of a knee intra-operatively during total knee replacement. This might help choosing the most appropriate type of reconstruction to get a closer to a normal kinematic.

67 **11h 02 M. ITOKAZU, M. MATSUURA, T. KURODA, T. SUZUKA, K. KAZUKI Effects of tranexamic acid and drain clamping method on post operative blood loss in bilateral total knee arthroplasty. A prospective, randomaised, controlled trial of use of tranexamic acid** Department of Orthopaedic Surgery, Osaka-City General Hospital,

Tranexamic acid and drain clamping method reduce blood loss in patients undergoing total knee arthroplasty(TKA) without systemic complications. But most of reports were in patients undergoing unilateral TKA. The objective of this study was to compare results in bilateral TKA.

Methods : We performed 30 TKAs(15 patients) between November 2009 and September 2010. After simultaneous bilateral TKA, we injectioned Tranexamic acid to the knee joint and drain clamping method the one joint(group T) , and injectioned only saline the other joint(group S) and drain clamping, and release the drain clamping at two hours post-operatively. We evaluated blood loss in drain at eight,twelve and forty-eight hours post-operatively.

Results : Blood loss at eight hours post-operatively was 98.2±83.9 ml in group T and 182.1±91.7ml in group S. Blood loss at twelve hours post-operatively was 131.3±95.9ml in group T and 209.3±108.1ml in group S. Blood loss at forty-eight hours post-operatively was 272.6±143.5ml in group T and 335.0±164.1lml in group S

Conclusion : Blood loss in group T was significantly lower than in group S at eight post-operatively. There was no difference in blood loss at twelve and forty-eight hours post-operatively. Because the half-life of Tranexamic acid in joint is three hours.

68 **11h10 M. ALAOUI "Personalized guides for standarts prosthesis"** Since the very beginning of orthopaedics, all manufacturers have actively participed in the evolution of the material an biomaterial related to joint prosthesis. However, yhanks to new technologies and more specifically to medical imaging, new possibilities are offered to day.

Indeed, we have developed a tool that enables a 3 D simulation of the knee. In order to optimize the positioning of the implant, to define its exact sizing and then to initiate the manufacture of personalized guides. The moulds adapt accurately to the patient's bones and offer the surgeon, the possibility of reducting the number of surgical steps. Therefore the instruments used and the surgery time are significantly reduced.

69 **11h 18 JY. JENNY, Y. DIESINGER, JY. SCHOENACH Navigated total knee prosthesis exchange. A comparative study with conventional technique** University of Strasbourg Dept Orthopedique Surgery

AIM OF THE STUDY: We hypothesized that the use of a navigation system will improve the accuracy of implantation of a revision total knee replacement (TKR).

METHODS: We used a standard TKR navigation system for 37 revision cases. The accuracy of implantation was assessed on post-operative long-leg radiographs, defining an accuracy note of 4 points. Prosthesis implantation was considered as satisfactory when the accuracy note was 4 (all fulfilled items). The rate of globally satisfactory implanted prostheses and the rate of prostheses implanted within the desired range for each criterion were recorded. The results of the 37 navigated revision TKR were compared to 26 cases of revision TKR performed with conventional intramedullary guiding systems.

RESULTS: We observed a significant improvement of all radiological items by navigated cases. Limb alignment was restored in 82% of the navigated cases and 74% of the conventional cases. 50% of the implants were oriented satisfactorily for the four criteria for navigated cases, and only 40% for conventional cases.

CONCLUSION: The navigation system enables reaching the implantation goals for implant position in the large majority of cases, with a rate similar to that obtained for primary TKA. The rate of optimally implanted prosthesis was significantly higher with navigation than with conventional technique. The navigation system is a useful aid for these often difficult operations, where the visual information is often misleading.

70 **11h 26 T. HIRANAKA, H. UEMOTO, Y. HIDA, M. DOITA, M. TSUJI Medial head border as a reliable target to identify the anatomical axis in uni compartimental knee arthroplasty** Department of Orthopaedic Surgery and Joint Surgery Center, Takatsuki General Hospital

To recognize the femoral mechanical axis (FMA) is known as a line passing through the femoral head center (HC) and the knee center (KC) and is significant in total knee arthroplasty (TKA). As to unicompartmental knee arthroplasty (UKA), although a femoral component should be inserted parallel to the FAA, it is not aiming the HC but more medial point, that might be the medial head border (MHB). The aim of this paper is to proof a hypothesis that the MHB is a reliable target for UKA. Twenty patients who have had UKA or TKA in our institution in 2010 were enrolled in this study. They are taken anteroposterior X-ray film of their both legs from the hip to the ankle. The HC, knee center (KC), MHB and the lowest point of the medial femoral condyle (LMC) were identified. A line passing through HC and KC was defined as FMA and s line passing through MHB and LMC was defined as medial mechanical axis (MMA), then an angle between FMA and MMA (mechanical divergence angle; MDA) were calculated. A mean MDA was 0.1 ± 0.2 °. There are no cases whose MDA was >2°. We concluded that the MHB is reliable aim to recognize the mechanical axis in UKA

71 **11h 32 Y. HOMMA, P. HERNIGOU Long term outcome (30 years) following TKA after HTO in young patients with varus deformity**

Knee replacement is a satisfactory pain relieving procedure in young patients, although survival may be poor. Isolated valgus osteotomy, with TKA at a later stage is one of the solutions for young patients. This two-step strategy would require either no overcorrection in the previous osteotomy to avoid jeopardizing later the arthroplasty, and subsequently poor pain relief unless the TKA has been performed; either overcorrection osteotomy that will improve pain relief to a better extent but will make the knee replacement hazardous because of the proximal tibial deformity. However, no result with a very long follow-up has been reported. This paper studies the results of these two operations with a follow up of more than 30 years after the osteotomy.

Total knee arthroplasty (TKA) following high tibial osteotomy (HTO) for the treatment of arthritis have specific technical difficulties. The aim of this study was to compare function, and survival outcomes of TKA in patients who had a previous HTO (opening or closed wedge technique) with TKA performed for primary arthritis. All the patients operated in our institution between 1985 and 1985 for the first operation (HTO) and between 1985 and 2000 for the TKA arthroplasty (HTO TKA group) were included in this retrospective study and compared to a randomly chosen group of patients operated on for primary arthritis (PA group) during the same period. 143 patients (average age 45, range 34-58 at HTO) were included in the HTO TKA group (70 after opening wedge technique, 73 after closed wedge) and 150 in the PA group. All implants were the same and cemented (postero-stabilised arthroplasties). The preoperative and postoperative deformities were measured on weight-bearing radiographs of the whole limb (hip-knee-ankle angle) before and after each operation.

KS knee and function score improvement were significantly lower in the HTO group ($p<0.001$). Post-operative flexion improves from 83˚ to 108˚ in the HTO group versus 115˚ to 127˚ in the PA group. However fifteen-year survivorship after the arthroplasty comparison showed no significant difference between the two groups (HTO group: 93.8% vs PA group: 95.8%; $p=0.07$). The previous high tibial osteotomy had no deleterious effect on the outcome of the subsequent total knee replacement. Other factors other than the osteotomy itself, including the operative technique (opening or closed wedge), the location of the osteotomy, and the number of knees that were severely overcorrected after the high tibial osteotomy, explained significantly ($p<0.05$) the inferior clinical results seen in such patients with a previous osteotomy.

Our results confirmed the clinical impression that "no bridges are burned" by performing a high tibial osteotomy, despite significant lower functional, and QOL results. This two-step strategy (isolated valgus osteotomy, with TKA at a later stage) allowed obtaining good results with 94% survivorship 30 years after the first operation (HTO) and 15 years after the arthroplasty.

71 **11h 40 R. KANAYAMA A new surgical technique concept: combination of measured resection technique and gap technique in total knee arthroplasty** Funabashi Orthopedic Hospital

Introduction: Although, both anatomical landmarks and equality of extension-flexion gaps are important in total knee arthroplasty, measured resection technique (MRT) and gap technique (GT) are thought as different techniques each other. In this study, a new concept about combination of MRT and GT is discussed.

Materials and methods: One hundred and fifty knees were investigated. Extension gap was made by standard resection of distal femur and proximal tibia. Flexion gap was made 4 mm smaller than usual resection of MRT by pre-cut of the femoral posterior condyle. Posterior osteophytes could be removed through this small flexion gap space. Finally, it was possible to choose MRT or GT by final decision about amount and rotation of posterior femoral resection.

Results: Ligament balance in flexion was within 3˚ in 122 knees and over 3˚ in 28 knees after soft tissue release. Medial tightness remained in 21 knees (4˚~9˚) and lateral tightness in 7 knees (4˚~10˚). Femoral rotation was changed in 26 knees at the final step of the surgery. Parallel cut as GT was performed in 3 knees. In 23 knees, rotation of femoral component was positioned between MRT and GT.

Conclusion: MRT and GT can be combined in the same surgical procedure and the rotation of the femoral component can be decided freely at the end of the surgery.

72 **11h 48 P. MERLOZ, A. BODIN, J. TONETTI, A. EID, J. TROCCAZ, M. MILAIRE, N. MAISSE ROBOTIC semi active system for femoral cut in primary TKR. Preliminary results.** (1) University Department of Orthopaedic and Trauma Surgery, CHU A. Michallon, 38043 Grenoble cedex, France(2) Equipe GMCAO – Laboratoire TIMC/IMAG (Université Joseph Fourier – CNRS UMR 5525), Institut d'Ingénierie de l'Information de Santé, Faculté de Médecine, 38700 La Tronche Cedex, France

Computer-assisted navigation has demonstrated improved implant positioning and alignment in TKA, at the expense of increased operation time and cost. Miniature robotic cutting-guides may provide a highly accurate and cost-effective solution for speeding-up procedures and saving time, in comparison to freehand navigation of conventional cutting blocks. The purpose of this study is to describe the first clinical use of the new *iBlock system*™, (Praxim, Grenoble, France), a femoral robotized cutting**-**guide and to give some initial results.

Material and method:

The *iBlock system*™, is comprised of primarily 3 components: a bone fixation base including an attachment for the femoral reference array ; a 2 Degree of Freedom (DoF) motor unit whose orientation can be precisely fine-tuned with 2 adjustment screws ; a universal cutting-guide for making the 5 femoral cuts

The different steps of the procedure are the following:

Fixation: 2 cancellous bone screws are inserted into the medial femoral condyle using a specially designed drill-guide.

Data acquisition and BoneMorphing***:*** Intra-operative 3D reconstruction of the patient anatomy without requiring pre-op imaging or planning.

Ligament balance in extension & flexion

Four people (four female, mean age 72 yo) were operated on with this system in 2010. They suffered of a knee arthritis with a moderate genu varum (HKA between 172° and 177°). All knees were operated on by a single surgeon. One model of TKR implants was used (Endurance, Lepine Group, France). The locations of the distal and anterior femoral cuts were digitized intra-operatively with the navigation system and compared to the planned location of the cutting planes. Overall leg alignment was measured on standing long-leg x-rays at 6 weeks post-op. The operating time (skin to skin) was recorded.

Results Clinical results were good (IKS score) and the post-operative X-rays showed a mean HKA angle of 181.1° ± 1.62 (range: 178.6° to 185°). The operative time is a little bit more important than the one generally observed with conventional procedures (10 to 15 mn). There were no complications in this series.

Discussion and conclusions:

Our early results indicate that the *iBlock s*emi-active cutting-guide is safe to use and results in precise cuts that are within an accuracy range of approximately 1 degree and 1 mm. The operating times were comparable (within ~5mn) with our conventional TKR times.

The disadvantage of such a system compared to a conventional imageless navigation system is the higher initial cost However, this is counterbalanced by several advantages We obtained similar clinical results to those reported with other navigation systems but with an operating time closer to conventional surgery We obtained a total respect of the femoral planning:. .

There is a significant reduction in the number of instruments compared to a conventional procedure Miniature robotic devices have the potential to make TKR navigation more efficient, accurate and easier to use.

This may encourage a higher level of adoption among surgeons in the future.

73 **11h 56 K.ODA, I. KISHIMOTO, S. KOTO, H. KINDO Results of total knee arthroplasty using a Japonese original medially pivoting implant: fine CR Nakashima medical** Department of Orthopedic Surgery, Takatsuki Red Cross Hospital, Osaka

Between March 2009 and December 2011, 63 patients underwent 67 primary TKAs the medial-pivot implant design aimed to emulate physiologic knee kinematics. Suguro et al observed the shape of Japanese knees in cadavers. The anteropsoterior lengths and transverse diameters of the femoral condyle and tibial plateau were measured and the size variation was investigated to allow design of the basic contour of the TKA implant. Anatomical shape of femoral condyle is reproduced. Posterior condyle offset can be acquired on the medial condyle. The built –in asymmetry of the F-T joint surface in the TKA implant gives a design that allows reconstruction of the anatomic femoral condylar shaped using the current TKA surgical procedure. The tibial insert is designed to conform to the medial plateau. The lateral plateau is designed with posterior slope, so that I adopt the tibial internal rotation through medial pivot motion. The Japanese Orthopaedic Association (JOA) score improved from 60.2 to 83.7 in objective. The average range of motion was 114.4degrees. The medial-pivot TKA provided significant improvement in the postoperative range of motion, objective JOA score, ($P < .05$) statistically.

74 **12h 04 H. KANAZAWA, Y. MARUYAMA, A. OSAWA, Y. GONDA, K. SHITOTO, K. KANEKO Clinical results of total knee arthroplasty for elderly patients 80 years and older** Department of Orthopaedic Surgery, Juntendo Urayasu Hospital, Juntendo University School of Medicine Juntendo University School of Medicine

With greater quality of life expectancy, an increasing number of elderly patients will require Total knee arthroplasty (TKA) in Japan. The purpose of this study is to evaluate reliability, safety of primary TKA in elderly patients 80 years of age or older Fourty primary total knee arthroplasties were performed in 33 patients. Twenty-eight of the patients were women, and 5 men. The average age at the time of surgery was 82.8 years (range, 80-89 years). Eight patients had staged bilateral TKA done after 80 years of age. These arthroplasties were done for osteoarthritis in 37 knees, rheumatoid arthritis in three. The mean length of follow up in this study was 24.9 months.

The knee society knee and function score improved significantly from a preoperative mean of 44.5 and 33.6 points to the latest follow-up scores of 94.8 and 64.7 points, respectively. Japanese Orthopaedic Association (JOA) score improved from 48.1 points preoperatively to 81.4 points at the latest follow-up.

Five patients had postoperative complications occur : Transient confusion in one patient, deep venous thrombosis in one patient and partial wound dehiscence in two patients. And mobilization under ansthesia was performed in one patient.

64 % of these patients required the use of a cane for walking outdoors postoperatively compared with 76 % of the patients used a cane preoperatively. And 3 patients still required the use of walker. Nine patients could walk with no support at the last follow-up whereas two patients had walked with no support before surgery. Consequently, functional gains were modest, but the pain relief was excellent.

The results of this study indicate that TKA is a valuable procedure even in elderly patients for improvement of pain relief and the quality of the life.

75 **12H 12 M. FUJIWARA, N. IKEDA Management of infected total knee arthroplasty**)
Nishikobe Medical Center2) Tamatukuri-Kouseinennkinn Hospital

Background; Infection following knee replacement is a challenging complication. Our strategy is “Continuous Irrigation and Debridement and Prosthesis Retention for Treating Infected Total Knee Arthroplasty”

Purpose; We examined the efficacy of our Method.

Methods; We retrospectively reviewed the medical records of 600 cases of TKA performed in our hospital since 1994, of which 8 cases were infected. First step is a continuous irrigation and debridement. Second step is a removal of prosthesis with an antibiotic-laden cement. Third stage is a replantation with cemented revision components.

Results; We could retain prosthesis in 4cases.

Conclusion; Almost all the cases had some risk factors before infection. A continuous irrigation and debridement and prosthesis retention is an effective method in 4 of 8 cases.

12h 20 Closing remarks

SESSION POSTER

1.Two cases of Klinefelter`s syndrome with an intractable leg ulcers

Yukiko YOSHIDA、Shinichi SEZAKI*、Kanako MITSUDA、Noriko YASUDA、Atsuo NAKANO、Satsuki TANAKA、Kouji MAEDA、Mitsuyo SHINTANI、Haruo NISHIMURA

Department of Diabetes and Endocrinology, Osaka Saiseikai Nakatsu Hospital*Plastic surgery, Osaka Saiseikai Nakatsu Hospital

Klinefelter`s syndrome, also known as 47XXY syndrome is a condition in which human males have two or more X-chromosomes. It is the most commonly occurring abnormality of sex differentiation in males. When one has Klinefelter syndrome, a well-known symptom is the presence of recurrent venous leg ulcers, which are the result of a post-thrombotic syndrome. However, in some cases, ulcers may be present in the arteries of the legs as well. People with foot or leg ulcers are vulnerable to serious infections.

Here we will report the cases of two men, both of whom have the 47XXY karyotype. The first case is a 43-year-old man and the second case is a 69-year-old man.
Case 1: The patient was diagnosed with diabetes at the age of 30.His HbA1c test showed that his diabetic control was poor. At the age of 35 the patient was diagnosed with venous ulcers. Because of the presence of typical physical features for Klinefelter`s syndrome, he was tested for Klinefelter`s syndrome. Klinefelter`s syndrome was confirmed. Eight years later, he was admitted to the hospital because of a high fever and a festering wound. The patient had been neglecting his daily medication. He was given insulin therapy and androgen therapy. We found Clostridium boturium after testing the pus from the foot wound. His foot`s symptom did not improve. Thus it was necessary to amputate his toes control the infection.
Case 2: He was diagnosed with diabetes at the age of 40. At the age of 52 it was discovered that he had venous ulcers in both of his legs. He also had peripheral arterial disease (PAD) in one leg. The leg had necrosis, so it was necessary to amputate his lower leg from below the knee at the age of 68.

2. Evaluation of treatment effects in knee OA by bone marrow lesions(BML) on MRI

Masashi HONJO[1], Kanji SHICHIKAWA[2], Takashi MORIMOTO[2]

TANE Hospital YUKIOKA Hospital

Purpose: Evaluation of the effects of treatments of knee OA has been focused until now on the measurement of thickness of joint cartilage, but problems were such as precision, long term follow up period etc. We tried to use for evaluating treatment effects the grading of extent and thickness of the BML on MRI.
Method: For patients with knee OA high molecular hyaluronic acid product(®Suvenyl) were injected intraarticularly 6 times and MRI(T_1, T_2, FSE, STIR) examination were performed in fixed intervals.
The first group was consisted of 13 patients (injected 6; not injected 7)and the second 20 (injected 10; not injected 10). The observation period was 6 months. Results and Conclusion: The evaluation of the treatment effects of knee OA by BML on MRI was enough sensitive and practical, in addition making possible to visualize and keep the data for a longtime. These results suggest, moreover, the importance of bone marrow factors in considering the pathogenesis of knee OA.

3.Virtual anatomy of the spinal disorders by using 3-D MRI, 3-D CT and Work station

Junji KAMOGAWA, Sanshirou SHIRAISHI Department Spine & Sports medicine, Shiraishi Hospital

Objective We show two unique virtual images of the spinal disorders, both 1) The 3-D MRI/MRA/CT fusion imaging without the use of contrast media, and 2) The 3-D CT myelography with translucent bone construction.

Materials and Methods DICOM data from both CT and MRI/MRA were transmitted to the workstation. We used 1.5-T MRI unit (HITACHI), 4-row CT unit (TOSHIBA), and Workstation (TOSHIBA).

Results We have made 3-D images of the spinal disorders (Cervical nerve tumor, spinal bone tumor, Lumbar spinal canal stenosis on degenerative lumbar scoliosis, Failed back surgery syndrome) by using the softwear work station.

Use of these virtual imagines for the spinal disorders successfully revealed the relationship between bone construction (bones, intervertebral joints, and intervertebral disks) and neural architecture (spinal cord, cauda equina and nerve roots) on a single piece of film, three-dimensionally and in color. Such images will be useful in elucidating the clinical condition of complex neurological conditions such as spinal tumors or degenerative lumbar disorders.

Conclusion In this report, methods adopted in our hospitals corporation for imaging, analyzing and displaying CT and MRI 3-D clinically feasible virtual images are introduced, focusing on the applications in the field of spinal surgery.

4.Serial MR images of grafts after ACL reconstruction using hamstring tendons

Takeshi KOMATSU, Hideki SAKANAKA, Hiroyuki GOTANI, Hidetoshi TERAURA, Ryu ONISHI, Koji TAMAI, Takanori TERAOKA, Keisuke SUZUKI, Yoshiki YAMANO Department of Orthopaedic Surgery, Seikeikai Hospital

We examined MR images of grafts after ACL reconstruction using hamstring tendons in 20 knees (19 patients) for less than six months and more than one year, post-operation, while considering the causes affecting the difference in signals. Although fourteen knees showed inhomogeneous low signal intensity before six months on T1-weighted imaging (T1WI), they were divided into five knees of intermediate, three of low and six of inhomogeneous low signal intensity - after one year. As for the T2-weighted imaging (T2WI), although eleven knees showed inhomogeneous low signal intensity before six months, they were divided into five knees of low and six of inhomogeneous low signal intensity - again, after one year. One of the knees examined using the Pivot Shift Test was positive for intermediate signal intensity on T1WI and inhomogeneous low on T2WI at the time of our final research, while others resulted in various findings. Four grafts with the same signals from normal ACL all had good stability; cases with abnormal signal intensity at less than six months were fairly common, however, many of their abnormalities that were retained on T1WI were also reduced on T2WI at over one year. We interred that ACL insufficiency could not be evaluated when showing only on T1WI, and that there is a possibility of graft insufficiency to show abnormal signal intensity on T2WI.

5.Operative outcome of dual SC screw for femoral neck fracture with minimal displacement

Soya NAGAO, Sayaka MOTOJIMA*, Nobumasa KIYOTAKI, Masahiro NAGAOKA, Yasuaki TOKUHASHI* Department of Orthopaedic Surgery, Surugadai Hospital, Nihon University School of Medicine Department of Orthopaedic Surgery, Nihon University School of Medicine

[Introduction] The aim of this study was to describe the result using a new device for the treatment of femoral neck fractures that uses 2 cephalocervical screws allowing linear compression and rotational stability of the head/neck fragment.
[Methods] Twenty-three consecutive patients were treated with a new implants (Dual SC screw; Kisco, Kobe, Japan) for femoral neck fracture with minimal displacement (Garden stage 1 and 2). All living patients were followed up for a minimum of six months postoperatively.
[Results] The mean age of the patients was 74.1 years (47-92 yesrs). The average operative time was 39.1 minutes (13-80 minutes). All fractures healed and radiographic analysis at healing revealed no nonunions, no femoral shaft fractures, and no implant failures. However, collapse of the femoral head was seen in two cases and screw was cut through the femoral head caused by malposition of the screw in one case.
Conclusions] This implant appears to be a reliable implant for the treatment of femoral neck fractures with minimal displacement. The results were satisfactory and this implant is now the standard treatment at our institution.

6.Operative outcome of dual SC screw for femoral neck fracture with minimal displacement

Soya NAGAO, Sayaka MOTOJIMA*, Nobumasa KIYOTAKI, Masahiro NAGAOKA, Yasuaki TOKUHASHI* Department of Orthopaedic Surgery, Surugadai Hospital, Nihon University School of Medicine*Department of Orthopaedic Surgery, Nihon University School of Medicine

[Introduction] The aim of this study was to describe the result using a new device for the treatment of femoral neck fractures that uses 2 cephalocervical screws allowing linear compression and rotational stability of the head/neck fragment.
[Methods] Twenty-three consecutive patients were treated with a new implants (Dual SC screw; Kisco, Kobe, Japan) for femoral neck fracture with minimal displacement (Garden stage 1 and 2). All living patients were followed up for a minimum of six months postoperatively.
[Results] The mean age of the patients was 74.1 years (47-92 yesrs). The average operative time was 39.1 minutes (13-80 minutes). All fractures healed and radiographic analysis at healing revealed no nonunions, no femoral shaft fractures, and no implant failures. However, collapse of the femoral head was seen in two cases and screw was cut through the femoral head caused by malposition of the screw in one case.
[Conclusions] This implant appears to be a reliable implant for the treatment of femoral neck fractures with minimal displacement. The results were satisfactory and this implant is now the standard treatment at our institution.

7.Fatal pulmonary embolism after surgery for clavicle fracture: a case report

Shogo SOBUE[1], Takefumi KAKETA[1], Katsutoshi NOIKE[1], Toshihito ONDA[2], Yoshimasa TOMITA[3], Sung Gon KIM[4], Masahiko NOZAWA[4] Department of Orthopaedic Surgery, Mejiro Hospital Department of Cardiology, Mejiro Hospital 3 Institute of Sasaki Foundation, Department of Orthopaedic Surgery, Kyoundo Hospital 4 Department of Orthopaedic Surgery, Juntendo University Nerima Hospital

It is recognized that patients undergoing upper extremity surgery are at lower risk of developing pulmonary embolism. We encountered a rare case of fatal pulmonary embolism after the surgery for the clavicle fracture.

A 46-year old man fell down from a car roof and suffered fractures of left clavicle, temporal bone and ribs and contusion of the cerebral and lung. He was admitted to near clinic, and was transferred to our hospital for an operative treatment of the clavicle fracture 6 days after the injury. He had no dyspnea and was ambulant before the surgery. Seven days after the injury, an open reduction and internal fixation was performed using a plate and screws under general anesthesia. There were no troubles and abnormalities of his vital signs during the surgery. Bradycardia was showed after returning from the operating room. He developed cardiopulmonary arrest and was resuscitated and intubated. Spontaneous cardiac output was restored after 10 minutes, but the GCS score was E1V1M2. A pulmonary embolus was diagnosed on enhanced CT scan that revealed a 15 mm defect of contrast in the right pulmonary artery. Thrombolytic therapy was started immediately. Despite maximum therapy, general condition worsened and he died 20 days after the surgery.
The routine use of mechanical and chemical thromboprophylaxis may be recommended for clavicle surgery.

8.Minimally invasive arthroscopic-assisted surgery of calcaneal fractures

Takeshi OGAWA, Hiroshi AMANO, Takahide MIYAMA, Koji YAMAMOTO Department of Orthopaedic Surgery, Toyonaka Municipal Hospital

In the operative treatment of the intra-articular calcaneal fractures, wound complications were serious problems. Some surgeons attempt minimally invasive treatment. The purpose of this study was to clarify the clinical outcome of minimally invasive arthroscopic-assisted surgery of intra-articular calcaneal fractures.

(Materials and methods) The subjects were 8 fractures in 8 patients. They were treated operatively from January 2009 to August 2010. There were 4 men and 4 women (mean, 51 y/o). We performed arthroscopic-assisted reduction and percutaneous fixation with Kirschner wires. If the reduction of the depressed fragments was insufficient, we make the lateral mini-incision and elevate the fragments. The bone defect was filled with artificial bone grafts. We assessed the wound complications, Boehler's angle, step-off of the subtalar joint and the clinical score. For the clinical score, we used the American Orthopedic Foot and Ankle Society ankle-hindfoot score (AOFAS score) at the last follow-up (mean, 7 months).

(Results) Boehler's angle changed from 5.3° to 32.4° postoperatively. Step-off of the subtalar joint changed from 5.3mm to 1.0mm postoperatively. There were no wound complications. At the last follow-up, the average AOFAS score was 90.
(Conclusion) Intra-operative arthroscopy was useful for precise reduction of the subtalar joint. The short-term outcome of this surgery was satisfactory.

9.Clinical results and surgical complications of distal radius fractures

Katsutoshi NOIKE[1], Shogo SOBUE[1], Takafumi KAKETA[1] Yoshimasa TOMITA[2], Kouichi KUSUNOSE[3], Masahiko NOZAWA[4] Mejiro Hospital Orthopaedic Surgery Institute of Sasaki Foundation Orthopaedic Surgery Tokyo Rousai Hospital Orthopaedic Surgery Juntendo University Nerima Hospital Orthopaedic Surgery

137 surgical cases (the average age: 59.8 years old, 46 males, 91 females) of distal radius fractures were investigated. The operation was done from June 2005 to September 2010. 121 cases were dorsally displaced, and the other 16 cases were volarly displaced. 14 cases (10.2 %) had other fractures such as of ipsilateral upper limb or other. 129 cases (94%) were operated internal fixation by palmer locking plate alone, the other 8 cases were done by a combination of palmer locking plate and external fixator. The clinical results were evaluated according to the Mayo Wrist Score.

Postoperatively, infectious lesions, an implant failure and non-union were found in all cases. 4 cases (3 %) had tendon ruptures (2 cases: FPL, 1 case: EPL and 1 case: EIP). 3 cases (2.1%) had CRPS, out of 2 cases were done by the combination.

5 cases (3.6%) demonstrated poor outcome. Out of 4 cases were done by the combination, or had preoperative ipsilateral upper limb fracture. Tendon ruptures did not affect outcome. Palmer locking plate fixation contributed to the better outcome of distal radius fractures due to its less loss of correction resulted in early initiation of rehabilitation. Cases with external fixation or with ipsilateral upper limb fracture demonstrated rather worse outcome in spite of fixation by palmer locking plate. Improvement of operative method and/or postoperative therapy might be necessary for such cases.

10.Three cases of the hook of hamate fracture using a minimum invasive technique with Acutrack mini screw

Taisuke SATO, Toshiya KUDO, Kouichi KUSUNOSE, Kentaro ARITOMI, Yoshimasa TOMITA, Kazuo KANEKO Department of Orthopedics Surgery, Juntendo University Hospital

A hook of hamate fracture is one of rare fracture in the carpal bone. In spite of the early diagnosis, the resection of fragment was the conventional treatment, although the weakness of grip and the pain due to the spicule excision and a scar were reported.

We performed the operation for the hook of hamate fracture using a minimum invasive technique with Acutrack mini screw.

The guide wire was inserted into the hook of hamate from the palmar side to dorsal side with X-ray imaged control.

Acutrack mini screw was then retrogradely inserted from dorsal side to palmar side of the carpal.

Stable internal fixation can be done by this procedure, using intramedullary method for the hook of hamate fracture. By doing so, there is less tenderness and pain on palmar side,even after early stage of surgery.

At 3 to 5 months, X-ray and Computed tomography demonstrated the healing of hamate fracture, and the complication was not found.

11.Techniques and complications of endoscopic trigger finger release

Naohide TAKIGAWA, *Muneaki ABE, Hiromitsu MORIUCHI, Muneki ABE, Kenji YASUI Department of Orthopedics, Nishinomiya Kyoritsu Neurosurgical Hospital * Shiroyama Hospital

Complications of open trigger finger release have been reported to be rare but are related mostly to wound complications. The main patient complaint after open trigger finger release is discomfort at the incision site. The objective of this study was to retrospectively review the complications documented for a cohort of patients who received endoscopic trigger finger releases.

Patients and Methods Medical records of 60 patients (25 men, 35 women; average age 64 years) who underwent endoscopic trigger finger release (77 fingers: 9 index fingers, 42 middle fingers, 23 ring fingers and 3 little fingers) between March 2007 and November 2010 were retrospectively reviewed. Thumbs were treated by an open approach and excluded from the study. Preoperative PIP joint extension lag was 8.2°. The criteria for patient selection included failed nonsurgical treatment for three months. The operative time, range of motion of PIP joint, reoperation rate, and surgical complications were recorded.

Clinical Results Average operative time was 13.9 minutes and postoperative PIP joint extension lag was 3.1°. Reoperation was done in 2 fingers (2.6%) due to insufficient proximal tendon sheath release. Surgical complications included longitudinal distal wound lacerations with cannula insertion due to limitation of MP joint extension in 5 cases. Nerve injury, wound infection or problems with wound healing was not found in present series.

Conclusion In this study complication of endoscopic trigger finger release was only minor wound laceration, and this procedure gives excellent clinical result without discomfort at the incision site.

12.Reconstruction with Frozen Autograft Treated by Liquid Nitrogen after Excision of Malignant Giant Cell Tumor in the Distal Radius: A Case Report

Yoshimasa TOMITA[1], Katsutoshi NOIKE[2], Koichi KUSUNOSE[3], Katsuo SHITOTO[4], Kazuo KANEKO[5] Department of Orthopedic Surgery, Institute of SASAKI foundation, Kyoundo Hospital Department of Orthopedic Surgery, Mejiro Hospital) Department of Orthopedic Surgery, TokyoRosai Hospital) Department of Orthopedic Surgery, JuntendoUrayasu Hospital Department of Orthopedic Surgery, Juntendo University

BACKGROUND: Several reconstructive procedures have been described for malignant giant cell tumor of the distal radius. A case of giant cell tumor of the distal radius after reconstruction with frozen autografted bone treated by liquid nitrogen was reported. The wrist arthroplasty was reconstructed by a new method.

CASE REPORT: A nineteen-year-old woman presented with a painful swelling at the right wrist. X-ray showed an expanding osteolytic lesion in the distal radius. Computer tomography and Magnetic resonance imaging revealed an expansive and destructive lesion in the distal radius. Pathological diagnosis of the biopsy was a malignant giant cell tumor. The curettage of the affected radius was performed and the resection of soft tissue including the extensor mechanism in the wrist. The osteotomy in the middle part of the ulnar was performed and released the soft tissue around the affected distal radius, and then the ipsilateral hand with the

distal part after osteotomy of the ulnar was inverted to the elbow. Reconstruction with frozen autograft treated by liquid nitrogen for twenty minutes and the osteosynthesis of the ulnar was performed with the locking plate. The extensor mechanism was reconstructed by tendon transfer and tendon graft. One year after surgery, she has satisfactory results. ISOLS score is 87%.
CONCLUSION: Most of authors prefer to use the vascularized fibular head to reconstruct the wrist after a wide resection of giant-cell tumors because of its similarity in shape to the distal radius. The problems of reconstruction using the vascularized fibula graft were the instability of the wrist joint including the distal radioulnar joint and the vascularity of the fibula head. If this new reconstruction technique resolves these problems, the frozen autograft bone may be considered one of the most useful materials for biological reconstruction of distal radius.

13.Minimally invasive plate osteosynthesis for distal radius fractures with a volar locking plate - Comparison with conventional open reduction and internal fixation -

Kazushige GAMO, Ayako UESUGI, Keiichiro OURA, Kohji KURIYAMA, Masayuki HAMADA, Hideo KAWAI Department of Orthopaedic Surgery, Hoshigaokakouseinenkin Hospital, Osaka

Purpose: For cosmetic reason, we have performed minimally invasive plate osteosynthesis (MIPO) with the shortest skin incision in treating distal radius fractures. The purpose of this study was to compare the operative outcomes using the volar locking plating system for distal radius fractures between conventional open reduction and internal fixation (C-ORIF) and MIPO. Methods: From 2006 to 2009, 10 patients were treated using Smart Lock Plate. The patients who had been treated with C-ORIF (Group-C) included 3 men and 2 women (mean age, 45 years) and those treated with MIPO (Group-M) included 5 women (mean age, 38 years). The range of wrist and forearm motion, and Cooney wrist score and radiographic outcomes were assessed.
Surgical Technique:［Group-C］ The standard volar approach of 50mm longitudinal straight skin incision was used over the flexor carpi radialis tendon (FCR). The radial border of the pronator quadratus (PQ) was incised and, if possible, PQ was reattached after plating.［Group-M］Two mini, 15mm and 5mm, incisions were used over FCR. PQ was incised transversely, and the plate was inserted from the distal incisions under the PQ.
Results: At 6 weeks after the operation, the extension and supination arcs of motion in Group-M were significantly greater than that in Group-C.
Conclusion: MIPO for distal radius fractures offers not only cosmetic benefits but also better functional outcomes in early postoperative period.

14.The new method of the reduction technique for the phalanx fractures of children（Double Joy Stick Method）

Norio HAGIWARA, Fumio HASHIMOTO, Takuya NAKAMURA, Kennshaku HASHIBA, Tomoyuki AKAMARU, Kazuya SSHINMURA, Masaru IKENO Department of Orthopaedic Surgery, Toyama Prefectural Central Hospital

[Objective] Most phalanx fractures in children are commonly treated manual reduction and plaster fixation or percutaneous pinning. But, there are times when manual reduction is difficult with peri-artcular fracture of children. In that case, after open procedure, the reduction becomes necessary, but at that time it often is difficult to control the bone

fragments of the fracture. We insert smooth-pins in the each bone fragments, and control with two smooth-pins as the joy stick way. This method is designated as Double Joy Stick Method.

[Material & Method] The eight patients included 7males and 1females ranged in age from 3 to 15 years old(average 8.9 years old) to 2006 November - 2010 July. Follow-up period was for a mean of 38.2 months ranged 7 - 56 months. All patients were basal fractures of proximal phalanx (Salter-Harris type II), and three patients showed overlap of fingers.

[Results] All patients showed fusion in rentogengrams four weeks after surgery. The pins removal leaving did in 4 weeks after the operation. And all patients be achieved almost full range of motion, not be showed overlap.

[Conclusion] When manual reduction is difficult with peri-artcular fracture of children, specially basal fracture (Salter-Harris type II) of proximal phalanx, Double Joy Stick Method is a useful technique.

15.Clinical outcome of limb-salvage reconstruction using constrained total hip megaprosthesis after resection of periacetabular malignant tumors

T. UEDA[1], S. KAKUNAGA[1], S. TAKENAKA[2], N. NAKA[3], N. HASHIMOTO[2], K. HAMADA[3], S. JOYAMA[3], I. KUDAWARA[1], A. MYOUI[2], N. ARAKI[3], H. YOSHIKAWA[2] *Osaka University Orthopaedic Oncology Group:* Department of Orthopaedic Surgery, Osaka National Hospital, 2-1-14 Hoenzaka, Chuo-ku, Osaka 540-0006, Japan Department of Orthopaedics, Osaka University Graduate School of Medicine[3] Department of Orthopaedic Surgery, Osaka Medical Center for Cancer & Cardiovascular Diseases

INTRODUCTION: Limb-salvage surgery for periacetabular malignant tumors is one of the most challenging problems in orthopaedic oncology. We developed an original megaprosthesis system with constrained total hip joint mechanism (C-THA) for such cases, and investigated their clinical outcome.

PATIENTS & METHODS: Between 1985 and 2009, we surgically treated 24 patients with periacetabular primary malignant bone and soft-tissue tumors using C-THA. There were 17 male and 7 female patients with age from 16 to 72 years (median: 44), including 11 chondrosarcomas, 8 osteosarcomas (including one parosteal), 2 GCTs of bone (locally aggressive benign 1, malignant 1), and others in 3. MSTS surgical stage was 2 IB, 18 IIB, 3 III, and one benign. Postoperative follow-up periods ranged from 2 to 212 months (median: 100).

RESULTS: Oncological outcome was 8 CDF, 3 NED, 1 AWD and 12 DOD. Wide surgical margin was achieved in 17 patients, marginal in 5, and intralesional in 2. There were 7 local recurrences (29%), resulting in hemipelvectomy in one. Other postoperative complications included deep infection in 8 patients (33%), dislocation in 4, and aseptic loosening in 2, necessitating 3 revision surgery and 3 implant removal. C-THA finally survived in 17 out of 24(71%). 21 patients postoperatively acquired ambulatory activity.

CONCLUSION: The present study demonstrated that C-THA is a simple and useful reconstructive technique after wide resection of periacetabular malignant tumors, though serious numbers of postoperative complications.

16.A hybrid reconstruction using endoprosthesis and pedicle frozen auto-bone graft treated with liquid nitrogen for malignant bone tumor in the femur

Tomoaki TORIGOE, Yoshiyuki SUEHARA, Taketo OUKUBO, Tatsuya TAKAGI, Kazuo KANEKO Department of Orthopaedic Surgery, Juntendo University School of Medicine

Introduction: Recycle auto-bone graft treated with liquid nitrogen is used for the reconstruction after a wide resection of a malignant bone tumor in several institutions in Japan. However there is a risk of articular cartilage collapse after liquid nitrogen freezing in the epiphysis of long bone in the lower extremities. We report a new technique of hybrid skeletal reconstruction using endoprosthesis and pedicle frozen auto-bone graft for malignant bone tumor in the femur.

Methods: We indicated this method for two cases of chondrosarcoma in the femur. At the surgery, hip or knee joint was dislocated and femur was elevated for liquid nitrogen soaking. A pedicle freezing method was kept continuation between tumor lesion and normal bone in the femur and osteotomy was not needed. After freeing procedure, hip hemiarthroplasty(HHA) or total knee arthroplasty(TKA) using long stem implant was performed.

Result: Each one case of hybrid reconstruction with HHA and TKA was performed. The final status of the patients was evaluated as continuous disease free survival and the post operative function score was 90% (Enneking system) at more than one year after the surgery.

Conclusions: A hybrid reconstruction using endoprosthesis and pedicle frozen auto-bone graft treated with liquid nitrogen was considered to be beneficial in the treatment for malignant bone tumor in the femur.

17.High-grade surface osteosarcoma in the femur reconstructed with a liquid nitrogen-treated autograft

Shuichi MORIYA, Tomoaki TORIGOE, Tatsuya TAKAGI, Hideo KOBAYASHI, Akira SAKURAI, Samii BANNO, Ryo SADATSUKI, Kazuo KANEKO Department of Orthopedics, Juntendo University School of Medicine

Case report: A 38-year-old female noticed pain and swelling in her left thigh for few months prior to visit to our hospital. She was referred to our hospital and CT and MRI revealed a tumorous lesion which attached to femur surface and extend to around soft tissue at the first visit. MRI revealed no intra-medullary involvement.

Histopathological diagnosis was a high grade osteosarcoma and clinical diagnosis was a high-grade surface osteosarcoma. We administered preoperative chemotherapy and its effect was evaluated as a partial response. Surgery was carried out as a local control. Our method was pedicle freezing which was kept continuation between tumor lesion and normal bone. Only one side osteotomy in the proximal site at the femur, femur and vastus lateralis muscle which completely covered tumor was elevated to outside of the thigh, after that femur included tumor lesion was frozen by liquid nitrogen soaking. Femur was returned to the original position after defrosting and intramedullary fixation was performed. This patient could walk without crutches six months after the surgery and final status was evaluated as a continuous disease free survival.

Discussion: Skeletal reconstruction using liquid nitrogen-treated autograft has some advantage include osteoinduction, preservation of the cartilage matrix, perfect anatomical fit, easy attachment of muscle, tendon and ligament and low cost. We considered that it was beneficial in the treatment of malignant bone tumor.

18.An evaluation of “squeaking hips” in ceramic-on-ceramic THAs

Chiho SUZUKI, Satoshi IIDA, Satoshi MAKI Department of Orthopaedic Surgery, Matsudo City Hospital

Ceramic-on-ceramic (COC) THA was introduced in 1970s. The advantages are less wear and no allergy. Recently, squeaking is recognized as one of the problems in ceramic-on-ceramic THA. The purpose of this study is to investigate any noises in COC THA.

Materials and methods We have performed 263 COC THAs. 235 hips were in women. Mean age at surgery was 59.1 years. Mean follow-up period was 43.6 months. Biolox Forte was used for all hips.

We defined noises as follows: type 0; none, type1; noises like click, pop and clunk etc., type 2; squeaking, type 3; audible noises to other people. We classified frequency as follows: grade 1; transient, grade 2; sometimes, grade 3; permanent.

Clinical and radiological factors were examined, and evaluated statistically.

Results 227 (86.3%) of 263 hips had no noises. 22 hips were classified in type 1 and 15 hips in type 2. 22 (61.1%) of 36 hips were transient. No statistical difference was observed between the occurrence of noise and the radiological factors

Discussion and conclusions The incidence of all noises was reported from 10 to 30% and that of squeaking from 5 to 10%. In this study, the incidence of noise was similar to other reports. The cause of squeaking is still unknown, however, a careful follow-up is needed in the future.

19.Wear of highly cross-linked polyethylene in total hip arthroplasty with 32-mm femoral head

M. SAITO, K. UESHIMA, M. FUJIOKA, Y. NISHIKUBO, S. INOUE, T. KUBO Department of Orthopaedics, Graduate School of Medical Science, Kyoto Prefectural University of Medicine

We investigated the clinical results and linear wear of highly cross-linked polyethylene in the total hip arthroplasty (THA) with 32-mm femoral head. We retrospectively studied 33 patients (36 hips) who underwent cementless primary THA using 32-mm cobalt chrome head between 2003 and 2007 in our hospital. Durasul highly cross-linked polyethylene liners were used in all hips. The mean follow-up was 5.0 years (3 to 7). Clinical results were evaluated with the Japanese Orthopaedic Association (JOA) hip score. The femoral head penetration was measured on plain radiographs. The mean postoperative JOA hip score was 85.6 points. Dislocation did not occur in all hips. A focal osteolysis in stem zone 1 was observed in one hip. The mean bedding-in penetration was 0.08 ± 0.17 mm. The annual penetration was 0.00 ± 0.06 mm per year. The mean linear wear rates were 0.01 ± 0.05 mm per year and 0.00 ± 0.07 mm per year for 5-mm and 6-8 mm polyethylene thickness group, respectively. Large head THA is expected that reduce dislocation and increase range of motion. In our study, 32-mm head and highly cross-linked polyethylene were associated with excellent midterm clinical, radiographic and wear results.

20.Treatment of infected ingrown toe-nails with memory-shaped alloy wires

K. KADONO*, Y. TANAKA, A. KIDO**, A. TANIGUCHI**, T. MATSUDA****

Department of Orthopaedic Surgery, Uda City Hospital** Department of Orthopaedic Surgery, Nara Medical University

A cause of an ingrown toenail is that an edge of the nail-plate poking into the lateral nail fold. Soft tissue around the nail is red, swollen, and possibly infected. We treated the infected ingrown toe-nails conservatively with a memory-shaped alloy wire

Materials and Methods Two hundred and thirty-seven consecutive patients with ingrown toe-nail or curved nail were treated with memory-shaped alloy wires in our hospital. Twenty-four patients had infected toes at the initial visit. Under digital nerve block, each edge of the nail-plate was dug up from the swollen granuloma. Then, two small holes were made at both ends of the nail and a memory-shaped alloy wire which bended convex superior was inserted. If the wire bends, it strongly turns back a straight because of super elasticity. The wire continues to spread the nail and decrease the inflammation.
Results and Discussion All the patients get pain relief immediately after the procedure. Inflammatory granuloma decreased, dried-up and healed in 22 days on average (ranged 4-63 days). In our series, the wire method never exacerbated infection. Due to potential aggravation, placing wire at infected area remains controversial. We believe that a stimulation of the nail edge develops the infection, so the separation between the nail and the nail fold improves the condition.

21. Clinical outcome of limb-salvage reconstruction using constrained total hip megaprosthesis after resection of periacetabular malignant tumors

T. UEDA[1], S. KAKUNAGA[1], S. TAKENAKA[2], N. NAKA[3], N. HASHIMOTO[2], K. HAMADA[3], S. JOYAMA[3], I. KUDAWARA[1], A. MYOUI[2], N. ARAKI[3], H. YOSHIKAWA[2]
Department of Orthopaedic Surgery, Osaka National Hospital, Hoenzaka, Chuo-ku, Department of Orthopaedics, Osaka University Graduate School of Medicine Osaka 540-0006, Japan Department of Orthopaedic Surgery, Osaka Medical Center for Cancer & Cardiovascular Diseases

INTRODUCTION: Limb-salvage surgery for periacetabular malignant tumors is one of the most challenging problems in orthopaedic oncology. We developed an original megaprosthesis system with constrained total hip joint mechanism (C-THA) for such cases, and investigated their clinical outcome.
PATIENTS & METHODS: Between 1985 and 2009, we surgically treated 24 patients with periacetabular primary malignant bone and soft-tissue tumors using C-THA. There were 17 male and 7 female patients with age from 16 to 72 years (median: 44), including 11 chondrosarcomas, 8 osteosarcomas (including one parosteal), 2 GCTs of bone (locally aggressive benign 1, malignant 1), and others in 3. MSTS surgical stage was 2 IB, 18 IIB, 3 III, and one benign. Postoperative follow-up periods ranged from 2 to 212 months (median:100)
RESULTS: Oncological outcome was 8 CDF, 3 NED, 1 AWD and 12 DOD. Wide surgical margin was achieved in 17 patients, marginal in 5, and intralesional in 2. There were 7 local recurrences (29%), resulting in hemipelvectomy in one. Other postoperative complications included deep infection in 8 patients (33%), dislocation in 4, and aseptic loosening in 2, necessitating 3 revision surgery and 3 implant removal. C-THA finally survived in 17 out of 24(71%). 21 patients postoperatively acquired ambulatory activity.

CONCLUSION: The present study demonstrated that C-THA is a simple and useful reconstructive technique after wide resection of periacetabular malignant tumors, though serious numbers of postoperative complications

22.Mid-term results of the cementless CLS stem

Tomokazu YOSHIDA, **Yuji YASUNAGA, * Takuma YAMASAKI, *Mitsuo OCHI Department of Orthopaedic Surgery, Graduate School of Biomedical Sciences, Hiroshima University, JapanDepartment of Artificial Joint & Biomaterials, Graduate School of Biomedical Sciences, Hiroshima University, Japan

Introduction: The clinical results of total hip arthroplasty (THA) with cementless prosthesis have been improving due to progress of the stem design and surface finish. Cementless Spotorno stem (CLS stem; Zimmer, Warsaw, USA) is a double-tapered rectangular straight stem. The purpose of this study is to evaluate the process to achieve stability of CLS stem.

Patients and methods: 186 consecutive patients (194 hips) at more than 5 years after THA using CLS stem were evaluated. The mean follow-up period was 87 months. The radiographic stability of the femoral stem was determined by Engh's criteria. The ascertained period of spot welds was noted by Gruen zones on the femoral side. The presence of stress shielding, and subsidence was also evaluated.

Results: Stable stem by bony ongrowth was identified in all cases. The mean period of expression of spot welds was 10.8 months at zone 2, 9.9 months at zone 3, 8.5 months, at zone 5, 8.8 months at zone 6. Stress shielding more than grade 2 was observed in 3 hips, which was non-progressive after 1 year postoperatively. No subsidence more than 2mm was observed in all the hips.

Discussion and Conclusion: CLS stem is considered to achieve firstly mechanical stability at trochanteric and subtrochanteric lesion, and secondly bony fixation under physiological load distribution within 1 year after THA.

23.Contribution of EOS stereo radiographic system to acetabular navigation in total hip arthroplasty:a new approach for acquisition of the anterior pelvic plane

Anselme Billaud, Alain Durandeau, Thierry Fabre University Hospital Bordeaux

INTRODUCTION: Acetabular navigation in arthroplastic hip surgery most often requires palpation of the anterior pelvic plane (APP). APP is not easily accessible in the lateral position. The objective of this study is to navigate acetabular component implantation with an acquisition limited to 3 ipsilateral points: acetabulum center, ipsilateral anterior superior iliac spine (IASIS) and ipsilateral posterior superior iliac spine (IPSIS). For this purpose, we used EOS imaging radiographic system before navigation procedure.

MATERIAL AND METHODS: An EOS imaging was performed on a radio-opaque saw bone. Points constituting the ipsilateral iliac plane (IP): Center of the acetabulum, IASIS, and IPSIS, as well as APP were first identified. Coordinates of these points were then exported to the navigation station. The navigation software was adapted for acetabular navigation in the APP through the only acquisition of the IP plane. Two cups were implanted. Orientation of the cups were measured with two methods: standard navigation with palpation of the APP, and navigation via EOS with palpation of the PI. These measurements were compared to those obtained with CT-Scan.

RESULTS: On the right side, inclination and anteversion were measured respectively at 48° and 13° with navigation via EOS, 46° and 14° with standard navigation, and 45° and 14° on CT-Scan. On the left side, inclination and anteversion were measured at 51° and 13° with

navigation via EOS, 47° and 12° with standard navigation, and 47° and 12° on CT-Scan. DISCUSSION: We propose an original valid experimental approach for acetabular navigation in the lateral position based on EOS imaging. This technique requires only acquisition of ipsilateral points for acetabular navigation. It simplifies standard procedure where contralateral points are hardly reachable in the lateral position. It must now be adapted to common practice and clinically and statistically evaluated.

24.Clinical results of minimally invasive total hip arthroplasties using cementless modular neck stems

Yoshinari FUJITA, Takeshi NOMURA, Shinichi UCHIKAWA, Atsushi FUNAYAMA, Yoshiaki TOYAMA Department of Orthopaedic Surgery, School of medicine, Keio University

Objective: The objective of this study is to assess the usefulness of taper-lock stems with modular neck for the adjustment of leg-length discrepancy (LLD) and lateral offset of femoral neck.

Materials and Methods: Twenty patients underwent 23 primary total hip arthroplasties with taper-lock stems with modular neck (M/L Taper Kinectiv^{TM}, Zimmer), which can select one from sixty variations. The original diseases consisted of 16 secondary osteoarthritis due to hip dysplasia, 4 avascular necrosis of the femoral head, 4 of rheumatoid arthritis and one rapidly destructive coxopathy. The modified Watson-Jones approach, which was an approach in the decubitus position between gluteus medius muscle and tensor fascia lata, was used in all cases. The mean age at the surgery was 72 years old. The mean follow-up period was 6 months. The leg length discrepancy and the lateral offset of femoral neck were measured.

Results: Hip score of the Japanese Orthopaedic Surgery Association (JOA) improved from 47.2 points preoperatively to 84.9 points at the final follow-up. The complications contained one fissure fracture of proximal femur and one peroneal nerve palsy, but there was no postoperative dislocation. The mean preoperative LLD was 8.6±6.3mm but the postoperative LLD was adjusted to 4.0±2.7mm. The preoperative offset ratio of femoral neck to unaffected side was 0.95±0.12 but the postoperative offset ratio were adjusted to 1.025±0.05.

Conclusion: The short-time clinical results of total hip arthroplasties using taper-lock stems with modular neck were excellent. The adjustment of LLD and lateral offset of femoral neck was accurately obtained.

25.Six cases of the hip joint dislocation after total hip arthroplasty by posterolateral approach

Hiraku HOTTA, Ukei ANAZAWA, Tateru SHIRAISHI Department of Orthopaedic Surgery, Tokyo Dental College, Ichikawa General Hospital

We have six cases of the hip joint dislocation after total hip arthroplasty out of 128 primary operations during April 2005 and February 2011. All cases were performed under posterolateral approach. Mean incision length was around 11cm. Since 2007, after we had seen the first dislocation case, we have repaired the posterior soft tissues, the piriformis muscle and short rotator muscles, and posterior capsule. Out of the six dislocation cases, two cases were anterior dislocation and four were posterior dislocation. At earlier stage, we mainly used 28mm diameter head. At later stage, since 2008 we have used possibly larger size head for example 36mm diameter. Moreover we have selected the changeable neck or

some different offset stems if possible since 2010. After those improvements of the methods we had not seen the dislocation. But recently, in February 2011, we experienced the posterior dislocation case with 36mm diameter head and changeable neck.

I prefer posterolateral approach because it can be used in most of all cases even in any difficult cases of total hip arthroplasty. But we cannot avoid the problem of dislocation, especially of posterior dislocation. It might be the limitation of this approach.

26.Total hip arthroplasty with cemented proximal replacement stem for deep infection

Naofumi OKAMOTO, Hirokazu IIDA, Taketoshi KUSHIDA, Tomohisa NAKAMURA, Kenichi OE, Taku ASADA, Takahiko WADA, Hirohiko TOKUNAGA Department of Orthopaedic Surgery, Kansai Medical University

OBJECTIVE: The aim of this study was to determine the outcome of total hip arthroplasty (THA) with the cemented proximal replacement stem (cemented megaprosthesis) in patients with proximal femoral bone loss due to deep infection.

METHODS: There were 9 hips of 9 patients (4 men and 5 women) with mean age of 70.8 years (62 to 83) replaced the cemented megaprosthesis with ALAC (antibiotic-loaded acrylic cement) from Septenber 2000 to December 2007. The mean duration of clinical follow-up was 61.3 months (32 to 109).

RESULTS: The mean Japanese Orthopaedics Assosiation hip score improved 31.4 points (12 to 49) to 61.9 (43 to 85). There were 2 dislocation and 4 recurrent deep infection. One dislocation was managed succesfully by closed reduction, and the other was managed succesfully after revisoin of the femoral component. Three recurrent deep infection were treated succesfully by debridement, antibiotics and ALAC, however, one of the three was maintained on long-term suppressive antibiotics. The other recurrent deep infection had to undergo 2 stage revision. At last follow-up, the patients had no additional dislocation and deep infection.

CONCLUSIONS: Our short-term results suggest that THA with the cemented megaprosthesis is one of the alternative options to salvage deep infection with proximal femoral bone loss.

27.The concerning with sectional metal ions levels and histological changes in the patients diagnosed of adverse reactions to metal debris after metal-on-metal total hip arthroplasties

Toru YAMAKAWA
Department of Orthopedics, Yamada Redcross Hospital

Adverse reactions to metal debris after metal-on-metal total hip arthroplasties are emerging problems. But the mechanism is unclear.
The aim of this study is to analyze the concerning with metal ions levels and the histological changes in the sections around the prostheses obtained during revision surgical procedures in these patients have suggested ARMD.
We analyzed the Co and Cr ions levels in the sections of periprosthetic pseudocapsules, pseudotumors in the pelvises and normal-looking sections nearby. Blood and joint fluid were also sampled and analyzed about metal ions. Co and Cr levels of the pseudocapsules were markedly elevated (Cr>Co). The levels of the pseudotumors were relatively elevated. However, these of neighbors of pseudocapsules were normal. Characteristic histlogical

changes in pseudocapsules and pseudotumors were necrotic tissues without viable blood capillaries. On the other hand, histlogical findings of the neighbors of pseudocapsules were inflammatory changes with viable small capillaries.This phenomenon suggested that no capillary necrotic field accelerated increasing of metal concentration. And high metal concentration makes additional tissue disability.

28.Short-term results of revision THA using cementless cup

Yusaku OKAMOTO, Hiroshi KAGIYAMA, Masuhiro TOMITA Department of Orthopaedic Surgery, Izumi City Hospital

Reconstruction of bone defects in revision THA is challenging. We have reconstructed the acetabular bone defects by cementless cup without bone grafts. In this study, we investigated the clinical and radiological results of revision THA in our series.

Materials and Methods Between 2005 and 2010, 32 revision THA were performed in 30 patients. The average age at revision THA was 69.2 years old. The previous operations were 25 THA, 6 BHA and one cup arthroplasty. In AAOS classification, 2 hips were type I, 3 were type II, 24 were type III, and 3 were type IV. Cementless cup without bone grafts was used for acetabular reconstrucaion. The average follow-up periods were 36 months.
Clinical results were evaluated by JOA (Japanese Orthopaedic Association) score. In postoperative radiographs, the height of cup center from the inter-tear drop line was measured.
Results The JOA score was improved from 44 to 75 points. Loosening of the cup was not detected, while clear zone was observed in 7 hips. The average height of cup center was 30mm. In some cases, bone repair in the bone defects around the cup was observed.
Discussion and Conclusions Reported results of revision THA using cementless cup were encouraging. The use of bone grafts is controversial. We aimed the direct contact between cup and host bone at least 50% of cup surface in revision THA. While the follow-up periods were short, our short-term results were satisfactory.

29.A comparison of analogue vs digital templating for preoperative planning of primary total hip arthroplasty. : A prospective study of 44 hips

Toshie SASAKI Takao KODAMA Department of Orthopaedic Surgery, Saitama Social Insurance Hospital

The purposes of this study were to compare the accuracy of analogue and digital templating for primary total hip arthroplasty (THA) . Digital radiograhs and templating system were introduced into our hospital in April 2010. We assessed the plans of 41 consecutive patients (44hips) who had had THA between 2010 and 2012. There were 2 men and 39 women with a mean age at surgery of 63.4 (40 to 78). The original disease is 34 osteoarthritis, 4 rheumatoid arthritis, 1 osteonecrosis of femoral head, 1 rapidly destructive coxarthropaty and 1femoral neck fracture. Three patients had had previous pelvic osteotomies. Using digital templating, prediction of sizing to within 1size was 91% accurate for femoral sizing and 100% accurate for acetabular sizing. Using analogue templating, prediction of sizing to within 1size was 95% accurate for femoral sizing and 88% accurate for acetabular sizing. We conclude that the introduction of digital templating has significant benefit in preoperative planning for THA as analogue templating.

30.The discrepancy of preoperative templating and implant size in THA

Kazumi ITO, Shuji SOUMA, Kazuhiro OINUMA, Hideaki SHIRATSUCHI Funabashi Orthopedic Hospital

In Japan, over 80% of THSs are preformed for dysplastic hips, and because of the wide variation of deformities in hip joints, it is necessary to prepare the various kinds and sizes of implants. However, the space for storage of implants is not so enough that it is important to decide the type and size of implants preoperatively.

The aim of this study is to evaluate the discrepancy between the preoperative templating and actual implant size of acetabular and femoral components and examine the possibility of less stock of implants for each operation in THA.

[Method] In 267hip of 236 consecutive patients, the size of implants included acetabular and femoral components were compared the preoperative templating with actual size utilized in the operation. The hip joint X-rays used in preoperative templating are identical with regard to magnification
.[Results] In acetabular components, the actual implant size were the same as preoperative templating size at 74.0% (198/267 hips). Otherwise, 49.2% (132/267 hips), actual preoperative templating size were equal in femoral components.
The remainder of the cup sizes ranged from 0.3% 2 sizes smaller, 8.2% 1 size smaller, 15.7% 1 size larger, and 1.4% 2 sizes larger. The remainder of the stem sizes ranged from 1.4% 3 sizes smaller, 1.8% 2 sizes smaller, 17.2% 1 size smaller, 22.1% 1 size larger, 7.4% 2 sizes larger, and 0.3% 3 sizes larges
[Conclusion]
It was showed that the discrepancy of size was larger in femoral component than in acetabular component. In this study, it is demonstrated that the appropriate size range of acetabular component that should be prepared preoperatively is 2size below and above, otherwise that of femoral component is 3size below and above.

31.Pathogenesis of primary osteoarthritis of the hip: long term clinical follow up

Takeshi MORIMOTO, Yasunori SHIMAOKA, Masao YUKIOKA, Kanji SHICHIKAWA Yukioka Hospital

We report a case of primary hip osteoarthritis with a follow up period of more than 20 years and radiographs suggesting pathogenesis of biological origin. A review reference is provided here with this case report.
[Case Report]
An 80 year old housewife complained of left anterior femoral pain in 1989. Radiographic findings were no joint space narrowing, minimum articular surface irregularities, multiple cysts at the acetabulum and the femoral head, and a few osteophyte formation. In 1997, under the diagnosis of diagnosis of left hip osteoarthritis with radiographic progression, left THA was performed.
In 2010, progressive degeneration of the right hip joint was suggested by finding femoral head collapse likely due to the necrosis of subchondral bone, and right THA was performed. Intraoperative findings included very mild synovitis, preservation of acetabular and femoral head cartilage, and maintenance of joint congruency. Histologically, there was necrosis of the subchondral bone as well as bone marrow edema but not any bone sclerosis.
[Discussion]
The time course of hip osteoarthritis in this case suggests an entirely different biological origin than the often-described mechanical and anatomical causes of osteoarthritis. We propose that a biological origin from subchondral bone marrow is an important factor for the development of primary osteoarthritis of the hip in this case.

32.Three-dimensional gait analysis of patients who underwent total hip arthroplasties using transtrochanteric approach

Hiroyuki MAKITA [1)], Rika SHIGEEDA [1)], Makoto OKOCHI [1)], Takashi ISHIDA [1)], Tomoyuki SAITO [2)] Department of Orthopaedic Surgery, Sumitomo Heavy Industries Uraga Hospital, Department of Orthopaedic Surgery, Yokohama City University School of Medicine,

Walking ability is one of the important facts for the patients after hip surgery. The purpose of this study was to evaluate the progression of walking ability after total hip arthroplasties with transtrochanteric approach using three-dimensional gait analyzer.

(Material and Methods) Fifteen patients who underwent conventional total hip arthroplasty were analyzed. All patients were implanted cemented Charnley-Kerboull implant using transtrochanteric approach. The mean age of the patients at the time of surgery was 66.2 years (range, 53-78). All patients were evaluated clinically by using the Merle d'Aubigne and Postel hip score and subjected to gait analysis at four different time points; preoperatively, 3 months, 6 months and 12 months postoperatively. The gait analysis on each patient was calculated with three-dimensional gait analyzer VICON 612 (VICON PEAK) and 2 centrally located force plate (Advanced Mechanical Technology Industry). After placement of the markers, the data were obtained while the patients walked at their own chosen speed without crutches. Walking speed, stride length as a spatial data, the range of flexion and that of extension and flexion or extension moment of force in operative hip were assessed.
(Results) The average Merle d'Aubigne and Postel hip score was improved from 8.9 points (range, 5-12) to 17.5 points (range, 16-18) at the 12 months after surgery. The walking speed and stride length were recovered well as time passed. The flexion moment of force and the range of extension during a gait cycle was improved by 6 months after surgery, however, at 12 months, these factor were slightly deteriorated.
Conclusion) With regard to gait kinematics, the patients after total hip arthroplasties were getting better favorably except flexion moment of force and the range of extension.

33.Periprosthetic fracture of femur after total hip arthroplasty

Yuri YABUKI[1)], Shigeru YANAGIMOTO[2)] Department of Orthopedic Surgery, National Hospital Organization, Tokyo Medical Center Department of Orthopedic Surgery, Saiseikai Central Hospital

Periprosthetic fracture is a serious complication after total hip arthroplasty. Many methods have been described to stabilise periprosthetic fractures around a total hip arthroplasty. This report presents our results the use of various plate fixation for periprosthetic fractures after total hip arthroplasty.
Six cases underwent fixation of periprosthetic fractures with various plate.
There are 6 cases (Male: 2, Female: 4, age 56-87) we treated. Vancouver classification ; A:1, B1:1, B2:3, C:1. We treated these all cases by internal fixation and in the case of loosening implant, added changing implants. We used LCP plating systems, GTR plating system, Accord plating system and Periarticular plating system.
These six cases have been followed for a minimum of a year. Each case achieved a good or excellent clinical outcome while radiographs demonstrated fracture healing and osseointegration. Five patients returned to their previous level of mobility. One patient required the use of wheel chair.
Periprosthetic femoral fracture treatment is based on the site of fracture, implant stability, and bone stock. The Vancouver classification offers a reproducible description of these factors with the subsequently easy formation of a treatment plan.

34.Efficacy of total knee arthroplasty in patients with established rheumatoid arthritis

Yumiko NOBUHARA[1], Yoshiaki OKAJIMA[2], Megumi NAKATA[1], Kengo AKASHI[1] Hirotsugu OHASHI[2], Shunzo NAMIUCHI[1] 1) Department of Rheumatology, Saiseikai, Nakatsu Hospital2) Department of Orthopaedic Surgery, Saiseikai Nakatsu Hospital

Recently, excellent clinical results have been reported for total joint arthroplasty (TJA) in rheumatoid arthritis (RA) patients. We analyzed the effect of total knee arthroplasty (TKA) on RA disease activity.
Between 2009 and 2010, 29 TKAs in 21 RA patients were included in 568 TKAs performed in our hospital. The measurement of RA disease activity using the Disease Activity Score 28 (DAS28), before and after surgery, was possible in 15 RA patients.

In most of the patients (12 of 15) disease activity of RA was improved after surgery, and especially in 2 patients, whose knee joints were the mainly damaged lesion, DAS28 keep under 2.6, that it indicates RA remission, long after surgery.

Only in one patient, DAS28 increased, and in 2 patients, it had almost no change by surgery.

This operative treatment generally relieves pain, improves physical function, and has a high level of patient satisfaction, and moreover, it could improve disease activity itself in RA patients. However, its efficacy in disease activity was temporary in many cases, it is suggested that combination between surgery and medication is important for RA treatment.

35.Knee flexion and extension power -More than 3 years after anterior cruciate ligament reconstruction using hamstring grafts-

Hiroki SAKAI, Akihiro TSUCHIYA, Izumi KANISAWA, Kenji TAKAHASHI, Tomonori NAGAMINE , Tatsuya TAMAKI Funabashi Orthopaedic Sports Medicine

Few studies have reported long-term results regarding knee flexion and extension power after anterior cruciate ligament reconstruction (ACLR) using hamstring grafts. This study compared the knee strength of operated and nonoperated knees >3 years after ACLR using hamstring grafts.
Subjects and methods

Total 372 patients underwent primary ACLR (anatomical double bundle ACLR, using semitendinous tendon with/without gracilis tendon) at our hospital from 2002 to 2005. We could measure muscle strength >3 years after ACLR in sixty-two patients(mean, 4.4 years; range, 3–6 years; 31 men, 31 women, average age at surgery, 25.6 years). Lower extremity concentric isokinetic peak extension and flexion power were assessed at 60 °/s angular velocity and their outcomes were divided by body weight.
Results
Extension isokinetic peak torque/body weight was 80.0 and 75.3 where as flexion isokinetic peak torque/body weight was 42.1 and 40.2 on the nonoperated and operated sides, respectively. Statistically significant differences were found between the groups for both parameters.
Conclusion
No recovery of knee strength seen >3 years after ACLR using hamstring grafts. In conclusion, the flexion and extension power were affected by deficit of hamstring grafts.

36.Comparison of in vivo kinematics during deep knee bending between fixed bearing and mobile bearing posterior stabilized total knee arthroplasty

Masashi TAMAKI[1], Tetsuya TOMITA[2], Shigeyoshi TSUJI[3], Takaharu YAMAZAKI[4], Kazuma FUTAI[1], Yasuo KUMUGIZA[2], Kunihiko KAWASHIMA[1], Norimasa SHIMIZU[1], Hideki YOSHIKAWA[2], Kazuomi SUGAMOTO[1] Department of Orthopedics, Osaka National Hospital Department of Orthopedic Biomaterial Science, Osaka University Department of Orthopedics, Hoshigaoka Koseinenkin Hospital The Center for Advanced Medical Engineering and Informatics, Osaka University Department of Orthopedics, Osaka University

Recently mobile-bearing total knee arthroplasty (TKA) has become more popular. However, the advantages of mobile bearing (MB) PS TKA still remain unclear especially from a kinematic point of view. The objective of this study was to investigate the difference and advantage in kinematics of mobile baring PS TKA compared with fixed bearing (FB) PS TKA. Femorotibial nearest positions for 19 subjects (20 knees), 10 knees implanted with Legacy flex with mobile bearing PS TKA, and 10 knees implanted with Legacy flex with fixed bearing PS TKA were analyzed using the sagittal plane fluoroscopic images. All the knees were implanted by a single surgeon. All the subjects performed weight bearing deep knee bending motion. The average range of motion between femoral component and tibial component was 119±18 in MB and 122±10 in FB. The axial rotation of the femoral component was 11.8±6.2 in MB and 11.8±4.9 in FB. There was no significant difference both in range of motion and axial rotation between MB and FB. The kinematic pathway pattern was externally rotated due to a lateral pivot pattern in both MB and FB. The data in this study demonstrates that there was no significant difference in kinematics of weight bearing deep knee bending motion.

37.Minimally invasive total knee arthroplasty using trivector retaining approach

Takashi MIYAMOTO, Masashi TAMAKI, Takafumi UEDA Department of Orthopedic Surgery, Osaka National Hospital

Introduction: The most important thing in the minimally invasive total knee arthroplasty (MI-TKA) is to maintain the quadriceps function. Among some different approaches for the MI-TKA, we are mainly using the trivector retaining approach. This approach makes us easier to access into the knee joint and to keep better visualization especially in the postero-lateral corner compared with the mid-vastus and the sub-vastus approach. It also provides better patellar tracking compared with conventional para-patellar medial approach.
Subjects and Methods: We performed MI-TKA for 63 patients with osteoarthritis (16 males, 43 females). The average patient's age was 71.6±6.8 years. We evaluated the clinical results after MI-TKA using trivector retaining approach.
Results: The average operation time was 99.7±7.8 minutes and the average length of skin incision was 9.5±0.7 cm. The lateral release rate was 6.3%. About the ability of straight leg raising, 47 patients (74.6%) were able to do in the operation day, 12 patients (19.0%) were in the next day, and 4 patients (6.4%) were two days after the operation. The day of start walking was average 2.4±0.5 days after surgery. The average flexion angle was improved from 116.4±12.7 to 120.3±7.3 degrees, and the average Japan Orthopedic Association knee score was also improved from 51.6±7.5 to 80.5±7.3 points. There was no complication related to the MI procedure.
Conclusion: Trivector retaining approach was one of the useful and safe methods for the MI-TKA.

38.Hemangioma of the patella: A case report of pathological fracture

Shunsuke NISHIMOTO, Hiroshi AMANO, Takahide MIYAMA, Koji YAMAMOTO, Nobuyuki HASHIMOTO Toyonaka Municipal Hospital

Hemangioma involves bone with low incidence, accounting for 1-6% of all bone tumors. It is most commonly found in the vertebral column and skull, but hemangioma involving a patella is extremely rare. We herein report a case of a capillary hemangioma arising in the patella complicated with pathological fracture.

A 76-year old woman suddenly felt a knee pain during walk and got unable to walk. Physical examination revealed massive joint effusion, and plain radiographs and computed tomography (CT) showed a transverse fracture of the patella. On magnetic resonance imaging, a mass like lesion measuring 16×12×15mm was also observed. It showed low and low/iso intensity on T1 and T2-weighted image, respectively. We performed open reduction and internal fixation by tension band wiring. Macroscopically, we could not identify tumor more than hematoma of fracture site. But microscopically, multiple large, thin-walled, dilated, blood-filled vascular spaces lined by endothelial cells were observed, resulting in a histological diagnosis of capillary hemangioma. At the latest follow up of 3 months after surgery, the union of fracture is almost completed and she recovered her former activities of daily life without symptom.

This study presents a rare case of patellar hemangioma with pathological fracture. This case report adds to the clinical experience on a serious complication of this rare disease.

39.The relation between maximum pelvic tilt angle in frontal plane and maximum knee extension moment during one leg squat

Kouichi MORIGUCHI Department of Rehabilitation, Saiseikai Yahata Hospital

We evaluate the physical function to pay attention to pelvic tilt in frontal plane during one leg squat to patients that anterior cruciate ligament(ACL) reconstruction have done. The purpose of this study is to investigate the validity of the evaluation that we do. Ten female healthy college students were recruited as the subjects for this study. The method calculated pelvic tilt angle in frontal plane (difference between maximum pelvic tilt angle and minimum pelvic tilt angle in frontal plane) and maximum knee extension moment during one leg squat by using three-dimensional motion analysis system and force plate, and examined the correlation. As a result, pelvic tilt angle in frontal plane and maximum knee extension moment during one leg squat admitted a positive correlation. This result corresponds to our clinical impression. So the validity of our clinical evaluation was shown.

40.Clinical and radiographic results of minimally invasive total knee arthroplasty

Hideo KOBAYASHI[1)], Naoto MITSUGI[1)], Naoya TAKI[1)], Yasushi AKAMATSU[1)], Hirohiko OTA[1)], Kenichiro TANAKA[1)], Tomoyuki SAITO[2)]) Yokohama City University Medical Center 2) Yokohama City University

There has been recent attention concerning minimally invasive total knee arthroplasty (MIS-TKA). The purpose of the current study was to compare 23 TKAs done through a minimally invasive midvastus approach (MIS group) with 9 standard TKAs (control group).

Methods: From October 1, 2007 to March 31, 2009, 30 female patients and two male patients were included the study. The underlying diagnosis was osteoarthritis in 25 patients, rheumatoid arthritis in 2 patients, and osteonecrosis in 5 patients. Skin incision length, operative time, length of hospital stay, and radiographic alignment including FTA and the Knee Society radiographic evaluation were investigated.
Result: Incision length was 8.8cm± 0.9cm in the MIS group, and 12.4cm±1.0cm in the control group ($p<0.0001$). There were no differences in operative time and length of hospital stay in two groups. Post operative radiographs reveal 5.6° of tibiofemoral valgus angle in the MIS group and 7.7° in the control group. The Knee Society radiographic evaluation (α/ β/ γ/ δ) were 97.3°/ 88.2°/ 3.3°/ 89.1°in the MIS group, and 98.4°/ 88.8°/ 4.6°/ 90.1° in the control group.
Discussion: Operative time and length of hospital stay were indistinguishable in two groups. The radiographic alignment and position of all the components was acceptable in all patients in both groups. MIS- TKA is a safe and efficient technique as well as a standard TKA.

41.Clinical results of MIS-TKA with Flexible Nichidai Knee- Comparison with conventional and MIS TKA -

Nobumasa KIYOTAKI, Shu SAITO*, Gen SUZUKI, Soya NAGAO, Yasuaki TOKUHASHI* Department of Orthopaedic Surgery, Surugadai Nihon University Hospital*Department of Orthopaedic Surgery, Nihon University School of Medicine

Objective: To examine the clinical results of minimally invasive total knee arthroplasty (MIS-TKA) through a mini mid-vastus approach.

Method: TKA procedures were performed on 387 OA knees in 285 patients, MIS-TKA in 150 of the knees and conventional TKA in 140 of the knees. The conventional group used a mid-vastus approach, and MIS group used a mini mid-vastus approach with MIS device. Treatment was by cemented TKA with FNK in OA patients over a year period. Evaluation was performed by means of the JOA score for clinical results and radiographic analysis.

Results: In the both groups the JOA score significantly improved by the time of the final evaluation. And there was no significant difference between the both groups for the operating time, ROM, complication and radiographic analysis. However MIS group is earlier on the first day of straight leg raising and shorter in hospital stay.

Conclusion: Some surgeons have reported that MIS-TKA has many advantages, so no difference of the clinical results between the conventional and MIS-TKA in long term. From this study, the clinical results of MIS-TKA are satisfactory on the short term.

42.Postoperative Evaluation of PCL in CR-TKA

Shinichi FUKUOKA[1)], Toshiaki MASADA[1)], Kei TANIURA[2)], Hiroyuki TANAKA[2)], Takeharu SASAKI[2)], Kunio TAKAOKA[1)] 1 Nishinomiya Joint Reconstruction Center 2 Nishinomiya Watanabe Hospital

Main roles of posterior cruciate ligament (PCL) are to promote femoral roll-back(FRB) and maintain the stability in flexion of the knee.
The purpose of this study was to evaluate the function of PCL after the cruciate-retaining(CR)-TKA.
(Materials and Methods) Between July 2009 and August 2010, 42 primary CR-TKAs were performed. All patients underwent Vanguard CR (Biomet, Warsaw, USA). First, we measured FRB during surgery, and we also measured with lateral sag view at 6 months after surgery.

Secondly, we measured medial and lateral gaps between femoral component and insert with axial radiography of the distal femur with 1.5 kg distraction force 6 months after surgery. (Results) At 6 months their mean American Knee Society Objective Score was 93.2, mean Functional Score 80.6 and mean maximum flexion 124°. Mean medial and lateral gap was 0.9mm (-0.1~3.7) and 1.6mm (0~7.7), respectively. Mean FRB was 59% (50.2~66.5) during surgery and 52.2% (41.8-66.7) 6months after surgery. There was a significant correlation between during surgery and 6 months after surgery about FRB ($p<0.0001$). (Discussion) Function of PCL in CR-TKA was unclear. This study reports the PCL was playing a role in promoting FRB and maintaining the stability 6 months after surgery in CR-TKA.

43.Patellar resurfacing compared with nonresurfacing in total knee arthroplasty for patients with rheumatoid arthritis

Shinichi MIZUKI, Fumihiko KONISHI, Kazuo KAMADA The Centre for Rheumatic Diseases, Matsuyama Red Cross Hospital

Whether to resurface the patella during total knee arthroplasty remains controversial. Before 2008, we have routinely resurfaced the patella and we have occasionally observed patellar fractures. Since then, we performed total knee athroplasty without resurfacing the patella. We have examined the differences in clinical outcomes of total knee arthroplasty with or without patellar resurfacing in a retrospective study of 32 knees in 30 patients with rheumatoid arthritis. A mean follow-up was 2.6 years. Knee pain, function and quality of life were evaluated using questionnaire and radiographic evaluation was performed. Disease activity of rheumatoid arthritis were evaluated using CRP and MMP-3. There were no significant differences for pain, function, quality of life, radiographic parameters and disease activity of arthritis between the two treatment groups. Neither revision surgery of implanted patellar components nor any later resurfacing of an unreplaced patella were done during the follow-up period. Although the follow-up was too short period, we do not recommend routine patellar resurfacing in patients with rheumatoid arthritis undergoing total knee arthroplasty.

44.Strength and postural stability after anterior cruciate ligament reconstruction

Ryoko NOMIYA[1)], Kenji SATO[1)], Izumi KANISAWA[2)], Akihiro TSUCHIYA[2)], Hideaki SHIRATSUCHI[2)] 1) Department of Rehabilitation, Funabashi Orthopedic Nishifuna Clinic 2) Funabashi Orthopedic Hospital

Purpose: Little is known about postural stability after anterior cruciate ligament (ACL) reconstruction. The purpose of this study was to examine isokinetic strength measurements and postural stability.

Methods: Eighteen hamstring tendons ACL- reconstructed patients (9 men, 9 women, mean age=25.9 years, 6 months after surgery) and 9 matched healthy controls (4 men, 5 women, mean age=24.3years) participated in this study. Concentric peak torque measurements of the knee extensors and flexors at 60 deg/s on an isokinetic dynamometer were taken. Unilateral dynamic postural stability was measured as a stability index in the anterior-posterior and medial-lateral planes with the Biodex Stability System. Peak torques and stability indexes in involved limb were compared with those in uninvolved limb and controls.
Results: The peak torque of the knee extensors was significantly lower in the involved limb than in the uninvolved limb and controls, while no significant difference was shown in the knee flexors. No significant difference for stability index was observed.

Conclusions: 6 months After ACL reconstruction, quadriceps strength was not within normal range compared with the contralateral limb and controls. Our results suggest that single-limb postural stability in the involved limb was not significantly different than the uninvolved limb or the controls.

45.Muscle strength recovery after MIS-TKA through Midvastus approach or Trivector Retaining approach

Takao KODAMA, Yuto OGAWA, Toshie SASAKI, Yukihiko OBARA Department of Orthopaedic Surgery, Saitama Social Insurance Hospital

The purpose of this study was to investigate differences in recovery of knee extensor muscle strength after MIS-TKA using a midvastus approach (MV) or a trivector retaining approach (TR). The peak torque values during isokinetic exercise at an angular velocity of 60 degrees/sec were measured using a Cybex machine before and two weeks after the operation. We calculated the differences in recovery rate of knee extensor muscle strength between two different approaches using unilateral TKA and simultaneous bilateral TKA.

Unilateral TKA showed an obvious difference in the postoperative recovery between the two approaches (p=0.0141). The recovery rates of peak torque values at two weeks postoperatively were MV 63.2 ± 34.6% and TR 83.2 ± 44.5%. On the other hand, simultaneous bilateral TKA showed no difference in the postoperative recovery of knee muscle strength between the approaches. The recovery rates at two weeks postoperatively were MV 80.8 ± 30.0& and TR 83.2 ± 48.9%.

Suturing the backside fascia tightly in TR, could be one of the reasons for giving better recovery rate in unilateral TKA. In bilateral TKA, placing burden on both lower extremities cannot be avoided, and this was considered to be one of the factors for good recovery of knee muscle strength independent of the approaches.

46.Simultaneous MCL Reconstruction using Autogenous Hamstring Graft with ACL Reconstruction for Combined Grade III MCL and ACL Injury

Tomohiro TOMIHARA, Gen YOSHIDA, Masatoshi TANIUCHI, Yoshinobu MATSUDA, Nagakazu SSHIMADA Department of Orthopedic Surgery, Shimada Hospital

Treatment for combined grade III MCL and ACL injury still remains controversial. The purpose of this study is to evaluate the clinical outcomes of simultaneous MCL reconstruction using autogenous hamstring graft with ACL reconstruction for combined grade III MCL and ACL injury (Group M), and compare to those of ACL double bundle reconstruction for isolated ACL injury (Group A).
Methods: There were 12 patients in Group M and 173 patients in Group A. An average age at operation was 30.3 years in Group M and 27.2 years in Group A, and an average follow-up period was 19.2 months in Group M and 21.6 months in Group A. In Group M, medial joint space opening (MJO) by valgus stress X-ray at 30 degrees of flexion was measured.
Results: KT measurement was 1.0 mm in Group M and 1.0 mm in Group A. IKDC subjective assessment was 88.8 points in Group A and 91.1 points in Group B. However, Lysholm score in Group M (84.8 points) was lower than that in Group A (89.5 points). One patient in Group M (8.3%) and 2 patients (1.2%) in Group A had limitation of knee extension. In group M, MJO was decreased postoperatively (3.8mm in pre-operation and 0.6mm in post-operation).

Conclusion: Simultaneous MCL reconstruction with ACL reconstruction provided good knee stability for combined grade III MCL and ACL injury and similar or slightly inferior clinical outcomes to those in ACL double bundle reconstruction for isolated ACL injury.

47.Two cases report of arthroscopic excision for painful bipartite patella; -Confirmation of early recovery by measuring the muscle strength-

Mitsuhuko KUBO, Kazuhiro UENAKA, Yoshitaka MATSUSUE Department of orthopaedic Surgey, Shiga University of Medical Science

[Objective] Bipartite patellar is usually asymptomatic or do not need any treatment even if symptomatic. However many kind of operation have been performed for unsolved bipartite patellar. Recently arthroscopic excision of separated fragment was reported and its less invasiveness has attracted attention. We examined its less invasiveness by measuring the muscle strength recovery of knee extension.
[Patients and Methods] Patients were two men, average age 25 years (15-35). Arthroscopic en-block excision of separated fragment was performed. We avoided unnecessary soft tissue release. Isokinetic muscle strength of knee extension was measured every month until 6 months after operation using ISOFORCE GT-360® (OG-giken).
[Result] Both patients had prompt relief of the pain and returned to full activity, including sports. The post-operative value of the peak torque of extension recovered to the same level as the pre-operative value at 2.5 months after the operation and improved to the same level as the contralateral value at the same time at 5 months after the operation.
[Discussion] The symptom of bipartite patella is usually during sports activity. Patient's hope is early recovery to sports activity and early recovery of muscle strength is important for it. Arthroscopic excision is less invasive especially for extensor mechanism and has an advantage for early recovery of muscle strength.
[Conclusion] Arthroscopic excision of separated fragment for bipartite patella is effective less invasive operation.

48.A comparison between over-the-top laminoplasty and laminotomy to lumbar canal stenosis by VAS score of JOA BPEQ at our hospital.

Hidehisa TORIKAI, Masatoshi INOUE, Hirotaka MURAKAMI
Department of Orthopedic Surgery, Chibaken Saiseikai Narashino Hospital

Recently less invasive surgery is one trend at lumabar canal stenosis. Evaluation of less invasion is various. The aim of this study is to investigate a degree of invasion from patient's view point. We evaluated the operative results of ipsilateral approach and bilateral decompression laminotomy (LM group) and over-the-top laminoplasty (LMP group) to lumbar canal stenosis by VAS score(visual analogue scale) of JOA BPEQ and our original ADL grading scale. LM group was 20 patients and 70.1 years old. LMP group was 10 patients and 73.3 years old. In LM group JOA score was 12.7 points before operation and 25.0 points after operation and recovery rate was 75.6 %. In LMP group JOA score was 13.0 points before operation and 23.0 points after operation and recovery rate was 64.8 %. After surgery both pain and numbness of lower extremity decreased rapidly in two groups. There was no change in low back pain between both groups. Pain in VAS score and ADL grading scale of LMP group was consistently better than those of LM group postoperatively. Hospitalization period was 14.2 days in LM group and 11.1 days in LMP group. At follow up period there was no difference of JOA score in both groups. Conclusion: In LMP group, wound pain ceased

more rapidly and bedridden period was shorter and it was considered that LMP was less invasive from the patient's standpoint during hospital stay. Preservation of the base spinous process plays some role in patients early pain relief.

49.Experience of using "Karayahesive" as hydrocoloid wound dressing following spine surgery

Makoto URUSHIBARA Funabashi Orthopedic Hospital

The subjects of this study were 50 patients who underwent spine surgery and received the treatment with Karayahesive and whose postoperative courses could be followed up for more than three months.
Subcutaneous suture was done and Karayahesive was used to close the wound. In this treatment, epidermal suture was not carried out. The drain was removed on the second day, and Karayahesive was removed on the third day after surgery. Taking a shower was permitted since the same day. In this manner, the treatment of the wound with Karayahesive was completed. Satisfactory wound healing was achieved in all cases. The patients suffered no complications such as ruptured suture, infection, allergic reaction or keloid/hyperplastic scar.
The primary uninfected suture wound is closed 6 to 24 hours after surgery and the wound surface is covered with epithelium. Accordingly, there is no value in covering the wound from 48 hours after surgery at most in order to prevent infection. It has been said that disinfection with povidone-iodine is unnecessary because such treatment destroys the fibroblasts and epithelial cells that play an important role in wound healing. For these reasons, the selection of dressing materials used immediately after surgery is an important part of postoperative wound management.
Karayahesive can be indicated for the treatment of acute wounds (suture wounds, abrasions, traumatic skin defects). It absorbs and retains the exudate from the wound, thus maintaining the moist environment needed to promote wound healing.

50.Clinical output and life prognosis of the patients with rheumatoid arthritis with mutilating-type joint involvement managed by surgical or non-surgical treatment for their grave cervical lesions

Kanji MORI, Shinji IMAI, Yasuo SARUHASHI, Kazuya NISHIZAWA, Yoshitaka MATSUSUE Department of Orthopaedic Surgery, Shiga University of Medical Science

There is little study that reports the clinical output and life prognosis of the patients with rheumatoid arthritis (RA) with mutilating -type joint involvement (mutilating-type RA) who were managed by occipitocervicothoracic fusion by complete follow-up.
Seventeen seropositive mutilating-type RA were extracted as the most deteriorating patients out of 504 conventional RA in foregoing our study.
We extended the follow-up period of these patients until their end of life and evaluated clinical parameters such as neurological symptoms, activity of daily living (ADL), cause of death and survival time.
Among these 17 patients, 11 patients underwent surgical treatments, whereas 6 patients did not. All surgically treated patients have received occipitocervical/occipitocervicothoracic fusion. The six non- operated patients worsened ADL and resulted in either complete bedridden or death within 3 years. Contrary, 11 operated patients either improved or maintained ADL until their death. Mean survival time after their major cervical involvements was 38 months in non-operated group and 66 months in operated group, respectively. The cause of death related to the cervical operation was not recognized.
Once seropositive mutilating-type RA develop major spinal involvement(s) that may lead to

neurological compromise, they are likely to undergo a life-threatening stage of the disease during the next 5-10 years.
Surgical intervention is beneficial not only to treat the neurological compromise but also to sustain their ADL levels during this stage of disease.

51.Clinical outcomes of surgical treatments for postoperative deep wound infection after spinal instrumentation surgery

Taketoshi KUSHIDA, Takanori SAITO, Atsushi IKEURA, Naofumi OKAMOTO, Masayuki UMEDA, Hirokazu IIDA Department of Orthopaedic Surgery, Kansai Medical University, 2-3-1 Shinmachi, Hirakata City, Osaka

Objective: The purpose of this study was to examine the frequency and outcomes of deep wound infection complicated by spinal instrumentation surgery.
Patients: Between July 2007 and June 2010, 446 patients underwent posterior cervical, thoracic or lumbar spinal instrumentation surgery.
Results: Deep wound infection occurred in 10 of 446 patients (infection rate, 2.2%), and Methicillin-resistant *Staphylococus aureus* (MRSA) was identified in 4 patients. All patients required the additional surgery, including wide debridement and continuous irrigation. Seven patients (6 patients with non-MRSA and 1 patient with MRSA) treated with the additional surgery could be completely recovered. However, 3 patients with MRSA infection could not be eradicated by the additional and finally required removal of the implant. The parameters such as CRP and ESR in the non-MRSA groups and MRSA group were normalized 44.1 days and 149.2 days after the first additional surgery, respectively. In all patients including 3 patients required the implant removal, JOA score at the final follow-up was improved compared with preoperative JOA score.
Conclusion: When deep wound infection occurs after spinal instrumentation surgery, initially surgical wide debridement and continuous irrigation should be performed. Furthermore, when such treatments are not effective, removal of the implant should be performed.

52.Outcome of radiotherapy for metastatic spinal tumors

Atsushi IKEURA, Taketoshi KUSHIDA, Masayuki UMEDA, Takanori SAITO, Naofumi OKAMOTO, Hirokazu IIDA Department of Orthopaedic Surgery, Kansai Medical University, 2-3-1 Shinmachi, Hirakata City, Osaka

<Objective> The purpose of this study was to evaluate our clinical outcome of radiotherapy for metastatic spinal tumors.
<Methods> Sixty-three patients (33 men and 30 women, aged 24-87; mean 67.7years) with metastatic spinal tumors underwent radiotherapy from February 2006 to December 2009. The primary lesion located was located in the lung in 14 patients, breast in 12,liver in 11, kidney in 4, prostate in 3, malignant melanoma in 2, stomach in 2, colon in 2, and others in 13.The pain relief was graded into 4 categories: severe, moderate, mild and non. Paralysis was accessed by Frankel classification. And ADL was graded into 4 categories: bedridden, wheelchair, walk with aid and walk.
<Results> After radiotherapy, 77.8% have pain relief, 22.2% have no change. As for the improvement of paralysis according to Frankel classification, 4.8% have improvement, 85.7% have no change, and 7.9% was worsened. ADL were improved in 11.1%, maintained in 85.7%, and worsened in 3.2%.

<Conclusion> These results suggest that radiotherapy was not able to obtain sufficient recovery of neurological function. However, this therapy was effective for pain relief and was able to maintain patient's ADL.

53.Thoracic spine fracture dislocation Technical notes and a case report

Masao OKAMOTO, Masahiro OKADA, Hisashi OHTSUKA Osaka Mishima Emergency Critical Care Center

The fracture dislocation of thoracic spine is usually associated with high-energy trauma. Therefore, it is important to achieve early spinal stabilization and prevent general complications. We design a new procedure to easily achieve good alignment using a half pin external fixator and report surgical procedure.
Surgical procedure We insert 2 pairs of pedicle screws above and 2 below the fracture dislocation followed by one pair of half-pins above and below the pedicle screws. Traction is applied across the fracture dislocation using manipulation forceps and good reduction may be easily achieved. Then we complete rigid fixation by setting pre-contoured rods with the cross-link. Finally, bone grafting and fusion are performed.
Case report An 18-year-old man, who was injured in a traffic accident, demonstrated complete paraplegia on transfer to our institute and presented with T7 fracture dislocation. It was completely displaced laterally and shortened by one vertebra. The fracture dislocation was reduced by our procedure and fixed with a pedicle screw system 8 days after the injury. He was transferred to another hospital for rehabilitation 24 days postoperatively
Discussion Although our procedure involves a more extensive approach just for inserting the half-pins, it can provide a simple maneuver and achieve good alignment. We consider that the mechanism consists of two factors: the flexibility of the ball joint of the pin clamp which works three dimensionally and traction force based on the cantilever theory, which reduces the displacement naturally.

54.A selective release of cervical muscles for cervical spondylotic myelopathy in patients with athetoid celebral palsy

Atsushi MATSUO, Tetsuo KANNO, Takashi MATSUO Department of Orthopaedic Surgery, Hifumi Foundation Minamitama Orthopaedic Hospital

Object; Cervical spondylotic radiculopathy or myelopathy complicated by athetotic involuntary movement is one of the most disabling problems observed in cerebral palsy. Although several surgical procedures have been described for cervical spondylotic myelopathy in adults with athetoid cerebral palsy, none has had satisfying long-term results. The purpose of this study was to evaluate the effectiveness of the selective release of cervical muscles and its influence on the stability of other spinal segments.
Methods; Between 2002 and 2005, 33 patients with cervical spondylotic myelopathy were treated with selective muscle release of multiarticular longissimus capitis, longissimus cervicis and sternocleidomastoideus. Twenty-two patients with more than a 3 year follow-up period in our hospital were examined. The mean age at the operation was 45 years (range; 27 years to 57 years).The mean follow-up period was 5 years and 5 months (range; 3 years to 8 years).
Results; We evaluated the clinical and radiographic results of 22 selective muscle release surgeries. On 9 patients, with continuing symptoms, anterior–posterior fusion was combined. Of the 22 patients, improvement of neck and upper extremity pain, sensory loss in the trunk and extremities, grip strength and elaborate finger motion was obtained in 21 patients. No

instability was observed at the adjacent levels to the fixed segment and additional cervical spinal fusion was not required.
Conclusions; Our surgical technique can effectively improve neurological symptom, decrease athetotic movement and minimize degenerative change of the cervical spine.

55.Anomaly of great vessels in the anterior aspect of lumbar region -A case report-

Kiyoshi SUGIMOTO Department of Orthopedics, Fukushima Seikyo Hopital

A woman aged 60 was carried into our hospital, suffering severe low back pain. It was then revealed that what she was suffering from was an infectious disease in the low back region. Methicillin Resistant Staphylococcus Aureus (MRSA) was responsible for the disease. After failure of conserative treatment, I decided on an operation to be carried out, in which the vertebral lesion was to be resected anteriorly and to be stabilized with autograft bone without any instrument. During the operation, I encountered a great vein just adjacent to the left side of aorta, which I was unable to identify at that time. Thanks to this great vein, the exploration of the anterior aspect of the vertebral body was found to be very difficult and dangerous. I was forced to go on with meticulous care. Somehow I did get it finished without any damage of great vessels. After the operation, the identification of this anomalous vein was pursued. It was a highly bifurcated common iliac vein.

56.Patients with malignancy who visited to a hospital with an initial complaint of a back pain

Hideto OBATA Department of Orthopedic Surgery, Yukoukai General Hospital

There are many patients who visit a hospital with a complaint of a back pain. Although the cause of a back pain varies, a very few patients have a back pain caused by a malignant bone tumor, and which is sometimes hidden and overlooked initially. We retrospectively reviewed 11 patients (10 males and one female with a mean age of 65.8 (48 to 84) years old) who visited us between 2003 and 2010 with an initial complaint of a back pain and were finally diagnosed as having malignancy. Four patients were initially diagnosed as a malignant bone tumor (metastasis), but the other seven were not. The initial diagnoses of the latter were lumbar spondylosis for four, and a vertebral compression fracture due to osteoporosis for three. They led to the final diagnoses of multiple myeloma for three, and a metastasis from a visceral cancer or unknown origin for four. The mean delay in diagnosis was 2.3 (1 to 3) months. In these cases, follow-up roentgenography (appearance of osteolytic change), CT (findings of bone destruction), MRI (findings of mass lesion), and laboratory examinations (detection of monoclonal protein) contributed to correcting the diagnoses. The importance of repeated and additional examinations for patients with a persistent back pain was emphasized.

57.Diagnosis of pyogenic spondylodiscitis without typical features on magnetic resonance imaging

Risako YAMAMOTO, Shozui TAKEMOTO, Shigeo JOJI, Naoki SUGITA, Mitsuru MOTOYAMA Department of Orthopedic Surgery, Yoshida General Hospital

The diagnosis of infectious spondylodiscitis has recently been facilitated by the introduction of magnetic resonance imaging (MRI). With the availability of MRI it has been reported that the sensitivity is 93 ~ 96% and the specificity is 92.5 ~ 97% (Khan IA, et al. 1999, Varma R, et al. 2001). We experienced a rare case in whom early detection of pyogenic spondylodiscitis could not be made due to negative findings on MRI.

The case is a 59 year-old male who visited our department with complaint of low back pain which had developed one week earlier. Lumbar MRI was conducted. C-reacted protein (CRP) studied on the same day was 25.49 mg/dl. Though MRI was reviewed by an expert radiologist and two orthopedic surgeons, there were no signs of spondylodiscitis on MRI including gadolinium enhanced study. As low back pain continued for one month, MRI was repeated, which led to the detection of spondylodiscitis and epidural abscess at L 3/4. At the early stage of infectious spondylodiscitis, there are rare cases, which lack typical findings on MRI. Even though the MRI may be normal, we should not only exclude infection in cases of continuous low back pain and of elevated CRP but also should consider the need for follow-up MRI.

58.Staged Scoliosis Surgery without blood transfusion in Jehovah's Witnesses A two-cases report

Kenta FUJIWARA[1], Akihiro KIN[1], Ichiro Baba[1], Atsushi Nakano[1], Futoshi MURAKOSHI[1], Mitsuhiro YOMODA[1], Yoshitaka KUROKAWA[1], Mitsuo KINOSHITA[1], Yoshihiro SEMOTO[2] 1 Department of Orthopaedic Surgery , Osaka Medical College 2) Imazu Hospital

The purpose of this study was to review two cases of Jehovah's Witnesses who underwent scoliosis surgery without blood transfusion.

Case 1: A 13-years-old boy presented with severe scoliosis associated with neurofibromatosis. Preoperative Cobb angle was 87 degrees in T4-T9. He and his mother were Jehovah's Witnesses. They refused any types of blood transfusions. We attempted a two-stage scoliosis surgery. Firstly, posterior correction and fusion T4-T9 was performed (blood loss was 400ml). 40days later after first operation, additional posterior fusion at T2-T10 was performed(blood loss was 220ml). Postoperative Cobb angle was 54 degrees. Blood transfusions were successfully avoided.
Case 2: A 14-years-old girl presented with idiopathic scoliosis. Major curve of this scoliosis was 79 degrees from T6-T12. She and her parents accepted autologous blood transfusion using a cell saver. We planned a three-stage operation. Firstly ,thoracoscopic anterior release at T5-T9 was performed(blood loss was 25ml). At a second stage of surgery, setting of pedicle screws, partial laminecomy for pedicle hocks were performed(blood loss was 230ml). Finally, posterior correction with fusion surgery was done at T4-L4(blood loss was 430ml). The scoliosis was corrected to 38 degrees.
Discussion: Usually, scoliosis surgery is very difficult without blood transfusion. In Jehovah's Witnesses, the staged surgery is a good method to correct scoliosis safely.

The POSTER Presentation take place in Salon ROYAT (3 computers opened from 8 am till 6 pm (Friday) and from 8 am till 12 am (Saturday)

Every poster should contain 10 to 12 slides under shape Power point.

Le comité d'organisation remercie les Sociétés :

CERAVER DEPUY France SA Pierre FABRE Médicaments
Groupe LEPINE LEO- PHARMA TORNIER
BIOM'UP KISKO BIOMET France ATF

pour leur participation financière ce qui a permis le succès de ce congrès.