31st JKCOS

The 31st Japanese-Korean Combined Orthopaedic Symposium

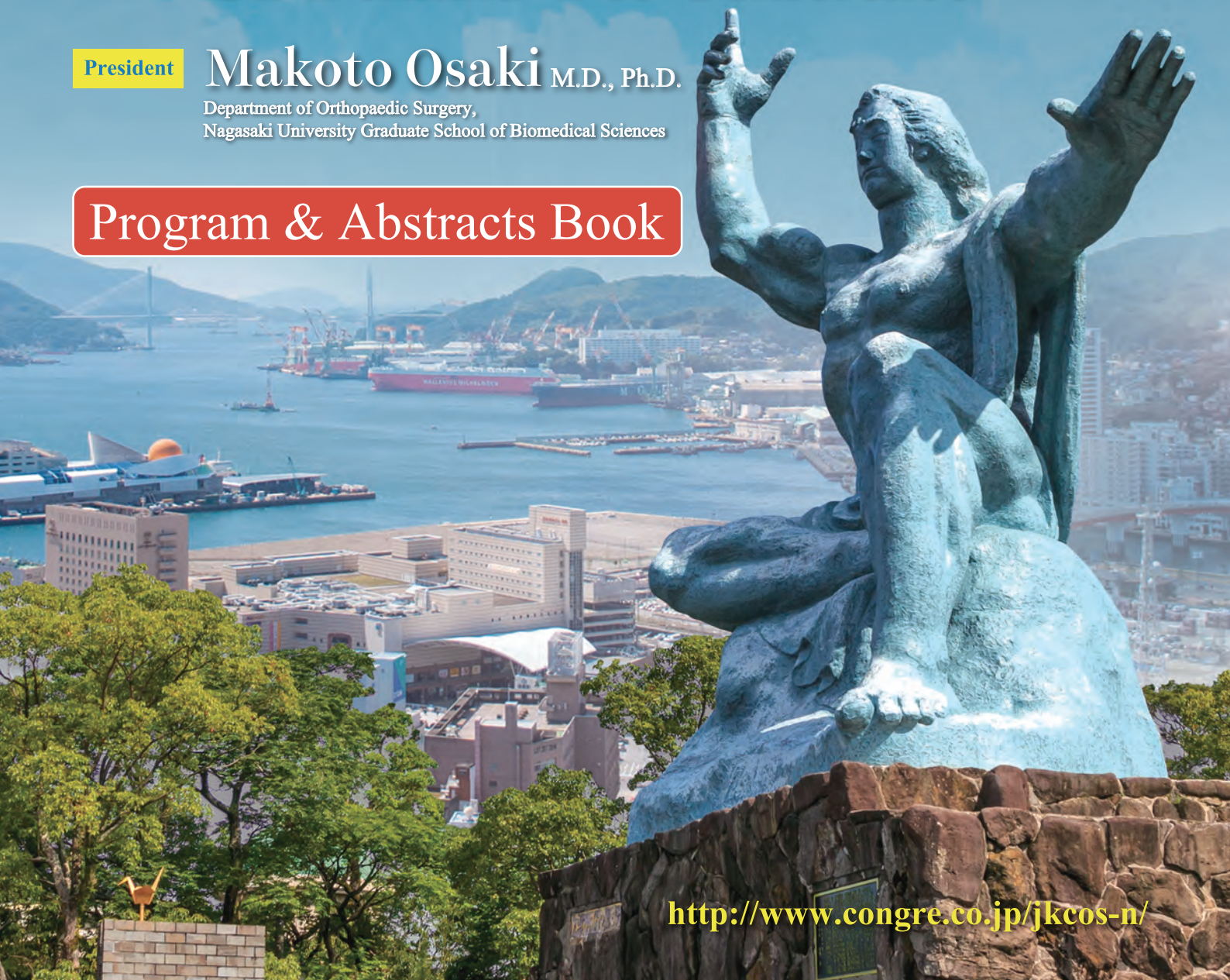
Dates September 1 (Thu) - 30 (Fri), 2022

Venue On-Demand Web Conference

President Makoto Osaki M.D., Ph.D.

Department of Orthopaedic Surgery,
Nagasaki University Graduate School of Biomedical Sciences

Program & Abstracts Book



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President: **Makoto Osaki, M.D., Ph.D.**

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Nagasaki University Graduate School of Biomedical Sciences

Contents

Greetings

Dear colleagues and friends,

The 31st Japanese-Korean Combined Orthopaedic Symposium (JKCOS) will be held from September 1 to 30, 2022 on the Web.

This symposium is very special for us because Emeritus Prof. Katsuro Iwasaki (4th president) and Emeritus Prof. Hiroyuki Shindo (18th president) have already hosted this meeting twice at Nagasaki.

The JKCOS(30th) was originally scheduled for April 2020 at Nagasaki. It had been postponed to September 2020 and canceled for the COVID-19 outbreak. Although the next 31st Combined Orthopaedic Symposium was scheduled to be held in Seoul in 2021, we had scheduled the 31st JKCOS at Nagasaki at the request of the Korean side. The 31st JKCOS was originally planned to be held in June 2021 and postponed to September 2022.

The first JKCOS/KJCOS annual meeting was held in 1990. For more than 30 years since then, the JKCOS/KJCOS played a significant role in providing venues for presentations and discussions on research achievements of orthopaedic surgery. All the members and attendees are “One Team”, not only for improving medical skills and research but also for deepening mutual understanding and friendship. This symposium is not just an academic meeting, but a meeting that has developed face-to-face communication between Japanese and Korean orthopedic surgeons. We also think that it would be better to avoid holding the event on the Web, for it might be difficult for doctors who are not accustomed to using the Web to participate. For those reasons, we have stuck to holding on-site events in Nagasaki.

On the other hand, this symposium is a very valuable opportunity for young orthopedic surgeons in South Korea and Japan to make presentations at international symposiums. Three years have already passed since the last KJCOS was held in 2019. There is still no prospect of the infection ending, and the restrictions on travel from South Korea to Japan have not been lifted. Now, we think that we should not stick to holding on-site events and should not postpone the symposium for another year or more.

The 31st JKCOS in Nagasaki will hold on the Web. We believe this is the best decision under the COVID-19 pandemic. We apologize for any inconvenience caused and appreciate your understanding and support.

We look forward to joining you on the 31st JKCOS.

Makoto Osaki, M.D.
President
The 31st Japanese-Korean Combined Orthopaedic Symposium

Department of Orthopaedic Surgery,
Nagasaki University Graduate School of Medical Sciences

Organizing Committee

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Myung Chul Yoo, M.D.

Secretariat Office

Department of Orthopaedic Surgery,
Nagasaki University Graduate School of Biomedical Sciences
1-7-1 Sakamoto, Nagasaki City, Nagasaki 852-8501, Japan
Phone: +81-95-819-7321

Symposium Secretariat

c/o Congress Corporation
1-9-17 Tenjin, Chuo-ku, Fukuoka 810-0001, Japan
Phone: +81-92-716-7116, FAX: +81-92-716-7143
E-mail: jkcos-n@congre.co.jp

History

Korean-Japanese/Japanese-Korean Combined Orthopaedic Symposium <KJCOS/JKCOS>

1st	1990	Nagoya	Ikuo NAGAYA	2nd	1991	Gwangju	Sung Man ROWE
3rd	1992	Sendai	Minoru SAKURAI	4th	1993	Nagasaki	Katsuro IWASAKI
5th	1994	Gyeongju	Joo-Chul MIN	6th	1995	Kanazawa	Katsuro TOMITA
7th	1996	Busan	Chong-Il YOO	8th	1997	Okayama	Hajime INOUE
9th	1998	Daejeon	Kwang-Jin RHEE	10th	1999	Wakayama	Tetsuya TAMAKI
11th	2000	Chuncheon	Seok-Hyun LEE	12th	2001	Nagoya	Nobuo MATSUI
13th	2002	Pyeongchang	Myung-Chul YOO	14th	2003	Asahikawa	Takeo MATSUNO
15th	2004	Jeju	Kwon-Ik HA	16th	2005	Gifu	Katsuji SHIMIZU
17th	2007	Seoul	Sang-Cheol SEONG	18th	2008	Nagasaki	Hiroyuki SHINDO
19th	2009	Jeju	Jae-Yoon CHUNG	20th	2010	Kagoshima	Setsuro KOMIYA
21st	2011	Daegu	Byung-Chul PARK	22nd	2012	Nikko	Yutaka NOHARA
23rd	2013	Buyeo	Joon-Kyu LEE	24th	2014	Hakone	Tomoyuki SAITO
25th	2015	Busan	Jeung-Tak SUH	26th	2016	Okayama	Toshifumi OZAKI
27th	2017	Incheon	Hae-Ryong SONG	28th	2018	Gifu	Haruhiko AKIYAMA
29th	2019	Pyeongchang	Yong-Girl RHEE	30th	2020	–	Cancelled
31st	2022	on Web (Nagasaki Univ.)	Makoto OSAKI				

Symposium Information

1. Venue

On-Demand Web Conference

2. Registration

All persons wishing to participate in the online symposium are requested to register online by September 30th, 2022. The registration will be completed upon receipt of the payment for the registration fee. Registered participants have access to all presentation whenever you want to view during the symposium period of September 1-30, 2022.

- Registration deadline: September 30th, 2022
- Registration fee: 10,000 JPY
- Payment: by Credit card only

■ URL to online registration

Please check the notes on this page before registering.

http://www.congre.co.jp/jkcos-n/registration/index.html

3. Viewing Presentations

Participants can view the presentations by following these steps for a month from Sep. 1st to Sep. 30th, 2022.

1. Access the WEB Symposium page from the URL below.

http://www.congre.co.jp/jkcos-n/participants/index.html

2. Login with your registration details
3. Select the presentation you wish to view from the list on the screen.
4. Press the Play button to watch the presentation.

Program at a Glance

September 1 (Thu) – 30 (Fri), 2022

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Sponsored Symposium 2	SS-2	Our strategy for treatment of rotator cuff repair	Noboru Taniguchi
Sponsored Symposium 3	SS-3	Fragility fracture treatment in Japan	Takashi Miyamoto
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	O1-2	Femoral lengthening over the nail in adolescents - Concern about the mechanical axis deviation	Kyeong-Hyeon Park
	O1-3	Higher incidence of aseptic loosening caused by lower canal filling ratio with a modified modular stem in total hip arthroplasty	Kyosuke Kobayashi
	O1-4	More accurate correction of lower extremity length is required during total hip arthroplasty in patients with ankylosing spondylitis	Chae-Jin Im
	O1-5	Revision THA using 3D printing technology in difficult cases	Taek-Rim Yoon
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	O2-3	Deep learning-based landmark recognition and angle measurement of full-leg plain radiograph for assessment of lower extremity malalignment	Changwung Jo
	O2-4	Long-term Outcomes of Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon–Patellar Bone Autograft	Do Weon Lee
	O2-5	Differences in the flexion and extension phases during kneeling investigated by kinematic and contact point analyses	Yusuke Nakazoe
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	O4-2	Surgical outcome of anterior cervical discectomy and fusion with uncinectomy for cervical spondylotic amyotrophy: A case-series	Eugene Park
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Scientific Program

Sponsored Symposium 1

SS-1 Longevity and exchangeability of cemented THA using Exeter stem in Japan

Hiroshi Fujita

Center for Hip arthroplasty, Senshunkai Hospital, Kyoto, Japan

Co-sponsor: Stryker Japan K.K.

Sponsored Symposium 2

SS-2 Our strategy for treatment of rotator cuff repair

Noboru Taniguchi

Department of Orthopaedic Surgery, Graduate School of Medical and Dental Sciences, Kagoshima University, Kagoshima, Japan

Co-sponsor: Zimmer Biomet G.K.

Sponsored Symposium 3

SS-3 Fragility fracture treatment in Japan

Takashi Miyamoto

Department of Orthopaedic Surgery, Nagasaki Medical Center, Nagasaki, Japan

Co-sponsor: Johnson & Johnson K.K.

Symposium 1: Hip and Pediatrics

O1-1 Trends in Developmental Dysplasia of the Hip at Nagasaki University

Shohei Matsubayashi, Hiroki Matsuzaki, Ritsu Tsujimoto, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O1-2 Femoral lengthening over the nail in adolescents - Concern about the mechanical axis deviation

Kyeong-Hyeon Park, Chang-wug Oh

Kyungpook National University Hospital, Daegu, South Korea

O1-3 Higher incidence of aseptic loosening caused by lower canal filling ratio with a modified modular stem in total hip arthroplasty

Kyosuke Kobayashi, Ko Chiba, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O1-4 More accurate correction of lower extremity length is required during total hip arthroplasty in patients with ankylosing spondylitis

Chae-Jin Im, Kyung Soon Park, Taek-Rim Yoon

Chonnam national university Hwasun Hospital, Hwasun-eup, Hwasun-gun, South Korea

O1-5 Revision THA using 3D printing technology in difficult cases

Taek-Rim Yoon, Kyung Soon Park, Chae Jin Im

Chonnam national university Hwasun Hospital, Hwasun-eup, Hwasun-gun, South Korea

Symposium 2: Knee

O2-1 Factors affecting postoperative clinical results of tibial condylar valgus osteotomy (TCVO)

Akihiko Yonekura[1], Narihiro Okazaki[1], Yusuke Nakazoe[1], Hiroyuki Takita[1], Ko Chiba[1], Hironobu Koseki[2], Makoto Osaki[1]

[1]Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan
[2]Department of Locomotive Rehabilitation Science, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O2-2 Subchondral bone microstructural analysis regarding the bone cut of total knee arthroplasty using high-resolution peripheral quantitative CT (HR-pQCT)

Kazuteru Shiraishi, Ko Chiba, Kyosuke Kobayashi, Saki Shiraishi, Naoji Tsurumoto, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O2-3 Deep learning-based landmark recognition and angle measurement of full-leg plain radiograph for assessment of lower extremity malalignment

Changwung Jo, Doohyun Hwang, Sunho Ko, Myung Ho Yang, Myung Chul Lee, Hyuk-Soo Han, Du Hyun Ro

Department of Orthopedic Surgery, Seoul National University College of Medicine, Seoul, South Korea

O2-4 Long-term Outcomes of Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon–Patellar Bone Autograft

Do Weon Lee[1], Du Hyun Ro[2], Myung Chul Lee[2], Hyuk-Soo Han[2]

[1]Korean Armed Forces Yangju Hospital, Yangju, South Korea
[2]Department of Orthopedic Surgery, Seoul National University Hospital, Seoul, South Korea

O2-5 Differences in the flexion and extension phases during kneeling investigated by kinematic and contact point analyses

Yusuke Nakazoe, Akihiko Yonekura, Hiroyuki Takita, Narihiro Okazaki, Ko Chiba, Masato Tomita, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O2-6 Comparison of in vivo kinematics for anterior cruciate ligament deficient knee before and after ACL reconstruction.

Kotaro Nishi, Akihiko Yonekura, Hiroyuki Takita, Yusuke Nakazoe, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Symposium 3: Shoulder and Sports Medicine

O3-1 Comparison between Clinical Results of Patch Graft and Superior Capsular Reconstruction for Irreparable Large and Massive Rotator Cuff Tear

Shiro Kajiyama[1], Tatsunari Aoki[1], Kiyoshi Sada[2], Makoto Osaki[1]

[1]Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan
[2]Nagasaki Genbaku Hospital, Nagasaki, Japan

O3-2 Evaluation of the Effect of Biceps Augmentation on the Improvement of Clinical Outcome during Incomplete Repair of Large-to-Massive Rotator Cuff Tear

Jong Hun Park, Su Cheol Kim, Hyun Gon Kim, Jae Soo Kim, Bo Taek Kim, Jae Chul Yoo

Samsung Medical Center, Seoul, South Korea

O3-3 US-guided needle decompression and steroid injection for calcific tendinitis of the shoulder: risk factors for repeat procedures and outcome analysis

Su Cheol Kim, Bo Taek Kim, Sang Min Lee, Gun Tae Park, Min Chang Jang, Jae Chul Yoo

Samsung Medical Center, Seoul, South Korea

O3-4 Activities and significance of rehabilitation doctors at the Tokyo 2020 Paralympic in Athletes Village Poly Clinic

Takaaki Aoki[1], Sayaka Fujiwara[2], Kazuyoshi Yagisita[3], Takao Akama[4], Haruhiko Akiyama[1], Roichi Akamatsu[1], Yuka Tsukahara[5]

[1]Gifu University, Gifu, Japan
[2]Tokyo University, Tokyo, Japan
[3]Tokyo medical and Dental University, Tokyo, Japan
[4]Waseda University, Tokyo, Japan
[5]Tokyo Women's College, Tokyo, Japan

Symposium 4: Spine and Osteoporosis

O4-1 Bicortical laminar screws for posterior fixation of subaxial cervical spine : A radiologic analysis with computed tomography images

Eugene Park, Woo-Kie Min

Department of Orthopedic Surgery, Kyungpook National University Hospital, Daegu, South Korea

O4-2 Surgical outcome of anterior cervical discectomy and fusion with uncinectomy for cervical spondylotic amyotrophy: A case-series

Eugene Park, Woo-Kie Min

Department of Orthopedic Surgery, Kyungpook National University Hospital, Daegu, South Korea

O4-3 Characteristics of bone microarchitecture in postmenopausal women with fragility fractures

Ko Chiba, Narihiro Okazaki, Makoto Osaki

Department of Orthopedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Symposium 5: Tumor

O5-1 Clinical analysis of the musculoskeletal tumor cases made different diagnoses between biopsy and surgery

Masato Tomita, Kentaro Nomura, Makoto Osaki

Department of Orthopedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

O5-2 The utility of clinical genomic profiling in the diagnosis and treatment of sarcomas

Eiji Nakata, Tomohiro Fujiwara, Toshiyuki Kunisada, Toshifumi Ozaki

Department of Orthopedic Surgery, Okayama University Hospital, Okayama, Japan

O5-3 Efficacy and safety of de-escalation of denosumab for giant cell tumor of the bone

Takuto Itano, Eiji Nakata, Tomohiro Fujiwara, Toshiyuki Kunisada, Toshifumi Ozaki

Department of Orthopedic Surgery, Okayama University Hospital, Okayama, Japan

O5-4 Parosteal lipoma arising in paravertebral muscle: A case report

Saki Shiraishi, Masato Tomita, Kentaro Nomura, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Abstracts

Sponsored Symposium

SS-1

Longevity and exchangeability of cemented THA using Exeter stem in Japan

Hiroshi Fujita

Center for Hip arthroplasty, Senshunkai Hospital, Kyoto, Japan

The longevity of cemented total hip arthroplasties (THA) has been improved by the introduction of modern cementing techniques including cement pressurization. Also, the results matter with the selection of the stem. The collarless, cemented Exeter hip system have been introduced to Japanese market at 1996. And now it became a top share brand (31%) in the Japanese cemented stem market used more than 6700 stems per year. It allows recreation of hip biomechanics due to its versatility in establishing an accurate center of rotation and the parameters of offset, leg length and version - all independently from each other.

For the acetabular side, cemented cup has a strong point in reconstructing porotic acetabula. A possible drawback is an aseptic loosening after 20 years due to its bio-inert character. To further improve ultra-long-term results, interface bioactive bone cement (IBBC) technique which involves smearing of hydroxyapatite (HA) granules on the dry bony surface followed by ordinary modern cementing techniques has been used in all recent primary THA procedures in our institute.

Combination of cemented cup with IBBC technique and Exeter stem can be used for every size and anatomical variations. Without preparing other systems, the system can be applied to any situations including dysplasia, sclerotic and porotic bones, deformed or post-osteotomy, and narrow canals.

No reports exist which have proven 100% survival rate against revision. Well-fixed components must be driven out in case of infection, dislocation, and problem of the other component. Not only longevity but also exchangeability is required. All-polyethylene cup and Exeter stem can be removed easily with standard equipment and reconstructed with cement in cement technique.

In this sponsored lecture, history, operative technique, and an excellent result of the cemented THA using Exeter stem will be provided during a presentation.

SS-2

Our strategy for treatment of rotator cuff repair

Noboru Taniguchi

Department of Orthopaedic Surgery, Graduate School of Medical and Dental Sciences, Kagoshima University, Kagoshima, Japan

Arthroscopic rotator cuff repair provides satisfactory results; however, there is still a high rate of retear. Here we present an arthroscopic surface-holding (ASH) repair technique with medial suture and transosseous fixation, which promises strong tendon-to-bone fixation as well as dispersing stress pattern. We found that this procedure improved rotator cuff healing, and would be useful for both young patients and elderly patients with osteoporotic bones. In addition, we investigated the effect of bone marrow stimulation (BMS) on cuff repair integrity after an ASH repair, and found that applying BMS to the footprint during ASH repair results in improved cuff repair integrity, particularly in large to massive tears.

Next, we developed a new scale measuring translation of the humeral head as a prognostic factor for treating rotator cuff tears. Although superior translation of the humeral head has been used to assess the severity of rotator cuff tears, the relevance of anterior migration of the humeral head to clinical outcomes has yet to be established. In this study, we found that the preoperative translation of humeral head scale (T-scale) but not acromiohumeral interval (AHI) correlated significantly with postoperative forward elevation (FE) and clinical scores in patients with large to massive tears but not in those with small to medium tears. Postoperative FE and clinical scores were significantly higher in patients with positive T-scale values than in those with negative T-scale values. The relative risk of retear was 2.0 to 7.9 times greater in patients with negative T-scale values. We concluded that patients with large to massive tears including negative T-scale values had poorer clinical outcomes and higher retear rates, and suggest that a negative T-scale value may represent a useful prognostic factor for considering reverse shoulder arthroplasty.

Moreover, we demonstrated that the postoperative T-scale was well correlated with the clinical results and postoperative AHI after rotator cuff repair for large to massive tears, and the poor outcomes were associated with combined superior and anterolateral migration of the humeral head following retears. These findings indicate that early postoperative T-scale measurements could be an early marker of clinical outcomes, which might be useful to more closely follow up at-risk patients.

Key words: surface-holding repair, large to massive rotator cuff tear, translation of humeral head scale

SS-3

Fragility fracture treatment in Japan

Takashi Miyamoto

Department of Orthopaedic Surgery, Nagasaki Medical Center, Nagasaki, Japan

Japan has become a super aging society in 2007 which the percentage of aged population exceeded 21%, and this number has been still growing up to 28.9% in 2022. The two main reasons are the lifetime extension, and the declining of the birth rates. Unfortunately, Japan is ranked number one country in aging society with a declining birthrate, additionally Korea is also ranked number fourth and caching up Japan very rapidly. Thereby, the number of fragility fracture is growing and numerous efforts are taken for geriatric fracture treatment. The total number of hip fracture is expected to reach 300,000 in 2030. Despite the hard work of medical professionals, the outcome of hip fracture treatment is not favorable. The percentages of the independent living drop down to 50% year after injury, and the mortality rate is about 10-20% which is higher than same age survival rate. It is clear that the hip fractures will affect patients' activity of daily life and their lifetime seriously.

The time to operate hip fracture was always blamed for these unfavorable outcomes, and it was about four day of admission which has not decreased tremendously in decade. Main reason for the delay was the operation room availability and lack of human recourses. Japanese society for fracture repair worked major role in negotiating government for insurance listing about the accelerating early hip fracture treatment, which the idea came from UK's best practice tariff for fragility hip fracture care. This year in 2022 the government approved to pay bonus for those treated within 48hours of injury in approved hospital. The amount was 40000 JPY which was not much as majority of the surgeons expected, but was a great one step for every surgeon and the patient. The approved hospital must declare treatment result by registrations to the worldwide network of fragility fracture network, and the results can be easily accessed on homepage of each hospital. Also, the prevention of secondary fracture is essential, and approved hospital would receive extra 10000 JPY bonus for starting the osteoporosis medication or treatment according to the national guideline.

It is unclear how many hospitals will continue to follow this accelerated hip fracture care followed by the osteoporosis treatment, but this should be the number one priority in Japan. This movement can be a game changer in our fragility fracture treatment, and hope to be the role model of Korea for near future.

Abstracts

Symposium

O1-1

Trends in Developmental Dysplasia of the Hip at Nagasaki University

Shohei Matsubayashi, Hiroki Matsuzaki, Ritsu Tsujimoto, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Objectives: To examine trends in developmental dysplasia of the hip (DDH) treated at the Nagasaki University Hospital.
Subjects and methods: We investigated all patients with DDH treated at Nagasaki University Hospital from 1956 to 2018, and all patients with DDH treated using a Pavlik harness.
Results: A total of 2746 patients with DDH were treated at Nagasaki University (446 male, 2300 female). The right hip was affected in 670 patients, the left hip in 949 patients, both hips in 426 patients, and unknown in 701 patients.
The Pavlik harness has been used since 1962. A total of 1129 DDH patients were treated with the Pavlik harness (158 male, 971 female). The right hip was treated in 285 patients, the left side in 433 patients, both hips in 105 patients, and unknown in 306 patients. The mean age of the infants with an indication for the Pavlik harness was 7.1 months at the time of initial examination.
Discussion: The number of DDH patients treated per year exceeded 100 in the 1960s. In the 1960s and 1970s, the Pavlik harness was used in 40–60 patients per year. Over the past decade, 2 or 3 patients per year are treated for DDH, and the number of Pavlik harnesses used is also 2 or 3 per year.

Keyword 1: DDH
Keyword 2: Pavlik harness
Keyword 3 :Nagasaki

O1-2

Femoral lengthening over the nail in adolescents - Concern about the mechanical axis deviation

Kyeong-Hyeon Park, Chang-wug Oh

Kyungpook National University Hospital, Daegu, South Korea

Femoral LON (lengthening over the nail) has a clear advantage to remove the external fixator early, to reduce complications. However, To our knowledge, the change of mechanical axis after LON is rarely known in adolescents. We aimed to determine whether femoral LON in adolescents has an inadvertent effect on lower limb alignment.

Between January 2001 and May 2020, we investigated 28 patients of femoral LON in this retrospective study. The mean age of the patients was 14.3 years (range, 9~18). The mean lengthening was 4.9 cm (range, 2.6 ~ 8.3). The mean duration for distraction was 82 days. Radiographic variables were compared in x-rays between pre-operatively and at the latest follow-up.

Pre-operative and post-lengthening m-LDFA was average 88.4° (range, 77.5~99.6) and 87.9° (range, 78.5~101) ($p=0.56$), respectively. Mechanical axis deviation (MAD) was changed from 0.6 mm lateral (range, 40 medial ~ 36 lateral) to 4.9 mm lateral (range, 39 medial ~ 55 lateral) in average ($p=0.03$). The mechanical axis shifted laterally by a mean of 1 mm/cm (range, -2.9 ~ 3.7) of lengthening. The anatomical axis angle between proximal and distal femur shaft was increased from varus 0.1° (range, varus 13 ~ valgus 6) to varus 3.3° (range, varus 25 ~ valgus 4.1) ($p<0.01$) in average.

In summary, femoral LON in adolescents did not significantly produce the lateral shift of the mechanical axis, which is thought to be due to the varus angulation during lengthening. Therefore, femoral LON is a safe procedure, with the minimal risk of potential arthritis of the knee.

Keyword 1: Femur
Keyword 2: Lengthening
Keyword 3: Nail

O1-3

Higher incidence of aseptic loosening caused by lower canal filling ratio with a modified modular stem in total hip arthroplasty

Kyosuke Kobayashi, Ko Chiba, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Purpose: Although a cementless modular prosthesis showed reliable results, we observed cases of unstable fixation and revision due to aseptic loosening in our institute. The purpose of this study was to clarify the causes of unstable fixation of the prosthesis.
Methods: A total of 97 patients (104 hips) who underwent total hip arthroplasty using the modular prosthesis were retrospectively investigated. The femoral component survival rate and sleeve fixation were assessed at a minimum follow-up of 5 years. Patients were divided into 2 groups, including stable and unstable fixation groups, by sleeve fixation. Clinical and radiographic outcomes were compared.
Results: The Kaplan-Meir survival rates at 9 years was 93% with revision for any reason as the endpoint. The reasons for revision were recurrent dislocation (1 hip) and aseptic loosening of the stem (5 hips). A total of 88 hips (84.6%) showed stable fixation, and 16 hips (15.4%) showed unstable fixation at the final follow-up. There was no significant difference in clinical outcome between the 2 groups at final follow-up. The canal flare index was significantly higher, and the canal filling ratio was significantly lower in the unstable fixation group.
Conclusion: Although the modified modular prosthesis was useful for treating anatomically difficult patients, we need to pay attention to both proximal/distal mismatch of the intramedullary canal and the canal filling ratio to achieve stable fixation and good long-term results.

Keyword 1: THA
Keyword 2: Modular prosthesis
Keyword 3: Aseptic loosening

O1-4

More accurate correction of lower extremity length is required during total hip arthroplasty in patients with ankylosing spondylitis

Chae-Jin Im, Kyung Soon Park, Taek-Rim Yoon

Chonnam national university Hwasun Hospital, Hwasun-eup, Hwasun-gun, South Korea

Ankylosing spondylitis is a chronic inflammatory disease that causes inflammation in multiple joints, more frequently in the spine and sacroiliac joints. Patients with ankylosing spondylitis have less flexibility in their vertebral joints. Spinal fusion often occurs in patients with advanced ankylosing spondylitis. Inflammation of the hip joint is known to occur in about 24 to 36% of cases, and total hip arthroplasty is the preferred surgical treatment for moderate-to-severe hip arthritis. The degree of discomfort has been reported to vary with differences in lower extremity length after hip arthroplasty of 5 mm to 10 mm. There were many cases of ankylosing spondylitis patients complaining of discomfort due to an imbalance of the lower extremities during walking or an imbalance of the whole body when standing after total hip arthroplasty. There has been no study on the extent to which the difference in the length of the lower extremities due to hip arthroplasty causes discomfort in patients with ankylosing spondylitis. The purpose of this study is to compare the difference in functional indicators after surgery in patients with ankylosing spondylitis by dividing the patient groups based on differences in the length of their lower extremities observed at follow-up after hip arthroplasty. Through this, we intend to present an acceptable range of differences in lower extremity length after hip arthroplasty in patients with ankylosing spondylitis.

Keyword 1: Ankylosing spondylitis
Keyword 2: total hip arthroplasty
Keyword 3: Leg length inequality

O1-5

Revision THA using 3D printing technology in difficult cases

Taek-Rim Yoon, Kyung Soon Park, Chae Jin Im

Chonnam national university Hwasun Hospital, Hwasun-eup, Hwasun-gun, South Korea

3D printing technology is widely used in the medical field. In the field of orthopedic surgery, it is used to use it for more precise diagnose the bony morphology and fir surgical simulation. It is also used to make the patient-specific surgical guides and patient-specific implants.
Total hip arthroplasty is used as the first treatment for advanced primary or secondary hip osteoarthritis and osteonecrosis of the femoral head. When revision surgery is required due to complications after arthroplasty, there are sometimes cases that are very difficult to operate with the conventional revision surgery using a reinforcement ring or Burch-Schneider cage, etc. Implant fixation may be difficult due to a severe deficiency of bone structure.
A patient-specific implant that fits exactly for the bone defect may be one of the best methods for extensive bone loss. Stable fixation of the implant is possible even though the surgical technique may not be so easy.
We would like to share our experiences with 15 patients with acetabular large bone defects, who were very difficult to treat with conventional methods, and they were treated using patient-specific 3D printing technology for the past two years.

Keyword 1: 3D printing
Keyword 2: Joint Revision
Keyword 3: Custom 3D implant

O2-1

Factors affecting postoperative clinical results of tibial condylar valgus osteotomy (TCVO)

Akihiko Yonekura[1], Narihiro Okazaki[1], Yusuke Nakazoe[1], Hiroyuki Takita[1], Ko Chiba[1], Hironobu Koseki[2], Makoto Osaki[1]

[1]Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan, [2]Department of Locomotive Rehabilitation Science, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

[Objective] To investigate the factors affecting postoperative clinical results of tibial condylar valgus osteotomy (TCVO) for advanced medial osteoarthritis of the knee.
[Subjects] The subjects were 78 knees in 68 patients at least 2 years after TCVO surgery, 23 knees for male and 55 knees for female. The mean age at surgery was 60.9 years (47-77 years), and the postoperative observation period was 4.9 years on average (2-11 years).
[Methods] Knee injury and Osteoarthritis Outcome Score (KOOS) was used as a patient-based evaluation method. The results were evaluated before surgery, 3 months after surgery, 6 months, 1 year, and then every year thereafter. The improvement status of each KOOS subscale was investigated using the scores within 2 years after the operation. In addition, factors affecting KOOS Pain subscale at the time of final follow-up were examined.
[Results] All KOOS subscale score improved from preoperative to 2 years after operation, from 46 to 75 for Pain, from 54 to 72 for Symptom, from 60 to 82 for ADL, from 21 to 47 for Sport and recreation function, and from 29 to 59 for QOL. However, KOOS Pain score at the last follow-up was poor in most patients with poor post-operative % mechanical axis (% MA) of less than 40% or more than 80%. KOOS Pain score tended to be poor in long-term postoperative cases with poor alignment.

Keyword 1: tibial condylar valgus osteotomy
Keyword 2: high tibial osteotomy
Keyword 3: Knee injury and Osteoarthritis Outcome Score

O2-2

Subchondral bone microstructural analysis regarding the bone cut of total knee arthroplasty using high-resolution peripheral quantitative CT (HR-pQCT)

Kazuteru Shiraishi, Ko Chiba, Kyosuke Kobayashi, Saki Shiraishi, Naoji Tsurumoto, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

【Introduction】

High Resolution peripheral Quantitative CT (HR-pQCT) enables us an ex-vivo bone microstructural analysis of relatively large bone samples compared to micro-CT. The purpose of this study was to analyze the bone microstructure of the proximal tibia assuming the bone cut of total knee arthroplasty (TKA) and to elucidate how bone microstructural characteristics change with the height of the bone cut.

【Methods】

Subjects were 10 cadaveric knees (ages 63-95, average age 79.7). Using HR-pQCT (XtremeCT II, Scanco Medical), the proximal tibia was scanned with a voxel size of 61μm. Two subchondral trabecular bone volumes of 3mm height were extracted from 7 mm and 10 mm below continuously from the lateral articular surface considering the proximal tibial bone cut for TKA. In addition, each bone volume (upper and lower layer) was divided into 3 regions: medial, central, and lateral, respectively. Finally, the subchondral bone microstructure of each region was analyzed and compared among them.

【Results】

Between the upper and lower layers, average bone volume fraction (BV/TV) (%) were 18.5 and 13.1 in medial regions, 6.9 and 6.8 in central regions, and 9.0 and 8.3 in lateral regions, respectively. In addition, the average trabecular thickness (Tb. Th) (μm) was 208.4 and 181.3 in medial regions, 179.6 and 181.1 in central regions, and 170.3 and 174.1 in lateral regions, respectively. There were significant differences regarding the bone microstructure in the medial regions between the upper and lower layers.

【Conclusion】

These results indicate that bone fragility may increase significantly in the medial joint if the operative bone cut of the proximal tibia is distal at 3mm compared to preoperative planning.

Keyword 1: knee
Keyword 2: total knee arthroplasty
Keyword 3: bone microstructure

O2-3

Deep learning-based landmark recognition and angle measurement of full-leg plain radiograph for assessment of lower extremity malalignment

Changwung Jo, Doohyun Hwang, Sunho Ko, Myung Ho Yang, Myung Chul Lee, Hyuk-Soo Han, Du Hyun Ro

Department of Orthopedic Surgery, Seoul National University College of Medicine, Seoul, South Korea

Purpose: Evaluating lower extremity alignment using full-leg plain radiograph is an essential process for the diagnosis and treatment of patients with knee osteoarthritis. The objective of this study was to present a deep learning-based anatomical landmark recognition and angle measurement model using full-leg plain radiographs and validate its performance.

Methods: A total of 11,212 full-leg plain radiographs were used to create the model. To train the data, 15 anatomical landmarks were marked by two orthopaedic surgeons. Mechanical lateral distal femoral angle (mLDFA), medial proximal tibial angle (MPTA), joint line convergence angle (JLCA), and hip-knee-ankle angle (HKAA) were then measured. To determine inter-observer reliability, inter-observer intraclass correlation coefficient (ICC) was evaluated by comparing measurements by the model, surgeons, and students to ground truth measurements annotated by an orthopaedic specialist with 14 years of clinical experience. To evaluate test-retest reliability, all measurements were taken twice for each measurer. Intra-observer ICCs were then derived. Performance evaluation metrics used in previous studies were also derived for direct comparison of model performance.

Results: Inter-observer ICCs for all angles of the model were 0.98 or higher ($p < 0.001$). Intra-observer ICCs for all angles of the model were 1.00, which were higher than that of the orthopaedic specialist (0.97-1.00). Measurements made by the model showed no significant systemic variation. Except for JLCA, angles were precisely measured with absolute error averages under 0.52 degrees and proportion of outliers under 4.26%.

Conclusions: The deep learning model is capable of evaluating lower extremity alignment with performance as accurate as an orthopaedic specialist with 14 years of experience.

Keyword 1: Deep learning
Keyword 2: Angle measurement
Keyword 3: Landmark recognition

O2-4

Long-term Outcomes of Anterior Cruciate Ligament Reconstruction Using Quadriceps Tendon–Patellar Bone Autograft

Do Weon Lee[1], Du Hyun Ro[2], Myung Chul Lee[2], Hyuk-Soo Han[2]

[1]Korean Armed Forces Yangju Hospital, Yangju, South Korea, [2]Department of Orthopedic Surgery, Seoul National University Hospital, Seoul, South Korea

Background: To date, there have been few studies on the outcomes of anterior cruciate ligament reconstruction (ACLR) using quadriceps tendon–patellar bone (QTPB) autograft.

Purpose: To evaluate the long-term clinical outcomes of ACLR using QTPB autograft.

Study Design: Case series; Level of evidence, 4.

Methods: We retrospectively reviewed 139 patients who underwent primary ACLR with QTPB autografts and had at least 7 years of postoperative follow-up data. Instability, clinical scores, donor-site morbidity, radiographic progression of osteoarthritis, and any associated complications were assessed.

Results: The proportion of knees classified as grade >1 on the anterior drawer, Lachman, and pivot-shift tests decreased significantly postsurgically (from 47.4% to 5.0%, 48.9% to 4.3%, and 53.3% to 5.0%, respectively; $P < .001$ for all). The mean clinical scores at the final follow-up were 89.8, 81.0, and 4.4 for the Lysholm, International Knee Documentation Committee, and Tegner Activity Scale, respectively. The results of the Cybex II dynamometer isokinetic test showed decreases in flexion and
extension strength at both 60 and 180 per second, which persisted until the final follow-up visit. About one-fifth (19.4%) of the patients had osteoarthritis (Kellgren-Lawrence grade 1) before surgery, which increased to 33.8% at the final follow-up. The overall complication rate was 23.2%, and about one-third of the patients who experienced complications underwent revision surgery as a result of graft rupture and residual instability.

Conclusion: In the current study, ACLR using QTPB autograft provided satisfactory long-term clinical results, with acceptable rates of complication and donor-site morbidity.

Keyword 1: anterior cruciate ligament
Keyword 2: anterior cruciate ligament reconstruction
Keyword 3: quadriceps tendon–patellar bone autograft

O2-5

Differences in the flexion and extension phases during kneeling investigated by kinematic and contact point analyses

Yusuke Nakazoe, Akihiko Yonekura, Hiroyuki Takita, Narihiro Okazaki, Ko Chiba, Masato Tomita, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Background: Kneeling is necessary for certain religious and ceremonial occasions, crouching work, and gardening, which many people take part in worldwide. However, there have been few reports of kneeling activities. The purpose of this study was to clarify the kinematics of kneeling.
Methods: The subjects were 15 healthy young males. Kneeling activity was analysed within a knee flexion angle from 90° to maximum flexion (max flex, mean ± SD = 150.9 ± 3.5°). The kinematic and contact point (CP) analyses were performed using a 2D/3D registration method, in which a 3D bone model created from computed tomography images was matched to knee lateral fluoroscopic images and analysed on a personal computer.
Results: In the kinematic analysis, the femur translated 14.4 mm posteriorly and rotated 20.1° externally relative to the tibia during the knee flexion phase. During the knee extension phase, the femur translated 12.9 mm anteriorly, which was almost the same amount as in the knee flexion phase. However, the femur only rotated 8.2° internally during the knee extension phase. In the CP analysis, the amount of anterior translation of the CP in the knee extension phase was greater in the medial CP and smaller in the lateral CP than that of posterior translation in the knee flexion phase.
Conclusion: In kneeling, a large amount of anterior translation of the medial CP occurred in the extension phase. This result suggests the possibility that the extension phase of kneeling has negative effects on the medial meniscus and articular cartilage.

Keyword 1: kneeling
Keyword 2: kinematics
Keyword 3: deep knee flexion

O2-6

Comparison of in vivo kinematics for anterior cruciate ligament deficient knee before and after ACL reconstruction.

Kotaro Nishi, Akihiko Yonekura, Hiroyuki Takita, Yusuke Nakazoe, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Purpose: The purpose of this study was to compare the joint kinematics of knee extension movements before and after anterior cruciate ligament (ACL) reconstruction.

Subjects: The subjects were 7 male patients who underwent double-bundle ACL reconstruction (ACLR) for ACL deficient (ACLD) knees. The mean time from surgery to postoperative fluoroscopic imaging was 26 months.

Method: The 2D-3D registration technique was used, in which fluoroscopic images of the subject's knee extension movements during non-weight bearing were taken before and after ACLR, and the obtained fluoroscopic images were matched with a 3D bone model created from the subject's computed tomography knee joint images. The rotation angle and anterior-posterior position of the tibia relative to the femur were analyzed and statistically compared in the ACLD knees, ACLR knees, and contralateral knees.

Results: The tibia was externally rotated relative to the femur as the knee extended in ACLD knees, ACLR knees, and contralateral knees. In ACLR knees, the tibia was more external rotated in all flexion angles compared to the other knee groups, but there were no significant differences. There was no difference in the anteroposterior position of the tibia relative to the femur between the three groups. In full extension, the ACLD knees were positioned more anteriorly than the knees of the other groups, but there were no significant differences.

Conclusion: In the ACLR knee, compared to the ACLD knee, the rotation of the tibia relative to the femur was overstabilized and the anterior translation of the tibia in full extension position was stabilized as well as the contralateral knee, which was considered to be due to the effect of ACL reconstruction.

Keyword 1: Anterior cruciate ligament
Keyword 2: Knee kinematics
Keyword 3: 2D-3D registration technique

O3-1

Comparison between Clinical Results of Patch Graft and Superior Capsular Reconstruction for Irreparable Large and Massive Rotator Cuff Tear

Shiro Kajiyama[1], Tatsunari Aoki[1], Kiyoshi Sada[2], Makoto Osaki[1]

[1]Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan, [2]Nagasaki Genbaku Hospital, Nagasaki, Japan

Purpose: The purpose of this study was to compare between clinical results of patch graft (PG) and superior capsular reconstruction (SCR) for irreparable large and massive rotator cuff tear. Materials and Methods: We studied 16 shoulders of 16 patients who underwent mini-open PG (9 cases) or SCR (7 cases) for irreparable large and massive tears. The patients were 12 males and 4 females, and the mean age was 62.3 years old. According to the morphology of ISP and TM tears, the PG was performed when posterior tear could be repaired and the SCR was selected when irreparable. Pre- and 1-year post-operative JOA score, UCLA score, ASES score, ROM, and MMT of external rotation were examined. Post-operative cuff integrity with MRI were also evaluated. Results: Mean JOA score, UCLA score, and ASES score of the PG and the SCR cases were improved significantly and there were no statistical differences between two groups. Active elevation of the PG and the SCR cases also improved postoperatively but external rotation did not change. On the other hand, MMT of external rotation of the PG cases significantly improved from 3.5 to 4.7 and the strength of the PG cases recovered better than that of the SCR cases (from 3.1 to 3.7). Re-tear was not observed in both procedure cases. Conclusion: The PG for irreparable large and massive rotator cuff tears had the same clinical results and re-tear rate as the SCR. The external rotation strength of the PG cases recovered better than that of the SCR cases.

Keyword 1: Irreparable rotator cuff tear
Keyword 2: Patch graft
Keyword 3: Superior capsular reconstruction

O3-2

Evaluation of the Effect of Biceps Augmentation on the Improvement of Clinical Outcome during Incomplete Repair of Large-to-Massive Rotator Cuff Tear

Jong Hun Park, Su Cheol Kim, Hyun Gon Kim, Jae Soo Kim, Bo Taek Kim, Jae Chul Yoo

Samsung Medical Center, Seoul, South Korea

Purpose: This study, which compared patients with biceps augmentation and incomplete repair against patients with only incomplete repair, aimed to evaluate the additional effect on the improvement of clinical outcomes and lowering retear rate in large-to-massive rotator cuff tears (LMRCTs).

Methods: We retrospectively reviewed 1115 patients who underwent arthroscopic rotator cuff repair for full-thickness tears between October 2011 and May 2019. Clinical scores were checked preoperatively and at six months, one year and two years postoperatively. In preoperative MRI, we measured the tear size, the degree of fatty infiltration and the muscle volume ratio of the supraspinatus. In postoperative MRI, the integrity of the repaired rotator cuff tendon was assessed by Sugaya classification. Tendon thickness at the footprint was evaluated on T2-weighted oblique coronal view. Patients were classified into groups I (incomplete) and B (with biceps augmentation), and their variables were compared.

Results: This study enrolled 77 patients (group I: 47, group B: 30). There were no significant differences in the initial preoperative demographic characteristics. In both groups, there were significant improvement in postoperative clinical scores ($p < 0.001$). Most shoulder ROM measures (FE, ER, IR, and ABD) showed some improvement in postoperative measures in the two groups. Group B (30%) had more retears than group I (15%), but not significant ($p = 0.117$).

Conclusion: In LMRCTs, there was no significant superiority in biceps augmentation with the hybrid repair. Therefore, biceps augmentation is not recommended in the treatment of LMRCTs.

Keyword 1: Large-to-Massive Rotator Cuff Tear
Keyword 2: Incomplete Repair
Keyword 3: Biceps Augmentation

O3-3

US-guided needle decompression and steroid injection for calcific tendinitis of the shoulder: risk factors for repeat procedures and outcome analysis

Su Cheol Kim, Bo Taek Kim, Sang Min Lee, Gun Tae Park, Min Chang Jang, Jae Chul Yoo

Samsung Medical Center, Seoul, South Korea

Background: Although ultrasound-guided needle decompression (US-GND) can treat calcific tendinitis of the shoulder effectively, repeat procedures might be required for unresolved symptoms. We evaluated the overall clinical outcomes of US-GND with subacromial steroid injection and the final results and factors predisposing toward repeat procedures.

Methods: Ninety-eight patients who underwent US-GND for calcific tendinitis of the supraspinatus/infraspinatus were analyzed between March 2017 and December 2018. The clinical outcomes (pain visual analog scale, functional visual analog scale [FVAS], and American Shoulder and Elbow Surgeons [ASES] score) and final subjective satisfaction were compared between groups A (single US-GND) and B (repeat US-GND). The factors predisposing toward repeated US-GNDs were analyzed.

Results: We found that 59.3% (58/98) of patients ASES scores were $\geq$80, and 73.5% of patients (72/98) were satisfied with the outcome. Group B (n=14) demonstrated a significantly higher rate of dominant-arm involvement compared to group A (78.6% vs. 48.8%, P=0.046). However, initial calcification size, shape, number, density, subscapularis involvement, lavage, and procedure time did not differ significantly between the groups. Group B showed poorer final FVAS (7 [interquartile range, 6-8] vs. 8 [interquartile range, 7-9], p=0.036) and subjective satisfaction compared to group A (satisfied: 5 [35.7%] vs. 67 [79.8%], p<0.001].

Conclusions: US-GND with subacromial steroid injection is a viable treatment option for calcific tendinitis of the shoulder. Dominant-arm involvement was the only independent factor for repeated US-GND. The final outcome of repeated US-GND for unimproved patients was promising; however, these outcomes were poor compared to those of the patients who improved after the first procedure.

Keywords: Calcification, physiologic; Decompression; Rotator cuff; Shoulder pain; Tendinopathy; Ultrasonography, Interventional.

Keyword 1: Calcification
Keyword 2: physiologic
Keyword 3: Decompression

O3-4

Activities and significance of rehabilitation doctors at the Tokyo 2020 Paralympic in Athletes Village Poly Clinic

Takaaki Aoki[1], Sayaka Fujiwara[2], Kazuyoshi Yagisita[3], Takao Akama[4], Haruhiko Akiyama[1], Roichi Akamatsu[1], Yuka Tsukahara[5]

[1]Gifu University, Gifu, Japan, [2]Tokyo University, Tokyo, Japan, [3]Tokyo medical and Dental University, Tokyo, Japan, [4]Waseda University, Tokyo, Japan, [5]Tokyo Women's College, Tokyo, Japan

The Tokyo 2020 Paralympics were held from August to September in 2021, during that time I had worked at the Polyclinic in the Olympic Village for 21 days. Medical conditions tailored to the actual conditions of various countries. Furthermore, in an unusual situation including infection control in COVID19, medical care was provided as the host country. Triage at the entrance of the polyclinic, checking the physical condition application program. The country and number of infected people were reported every day, but I was a little relieved because there were no close contacts or infected people in the polyclinic, but I think that the fever clinic was really difficult in the hot summer. increase. In the Paralympics, the cause of fever may be cystitis or pressure ulcer, so it may be necessary to immediately determine whether it is COVID19 or not and start the original treatment. The situation of each department is various, and there are a lot of ophthalmologists and dentistry patients, and there are many people who want to make eyeglasses in ophthalmology and treat all dentistry within the period. Was satisfied. The emergency service is available 24 hours a day, but due to COVID19, it was difficult to transfer from the polyclinic to the hospital. Transport communication with each affiliated hospital over the phone did not go well, and I sometimes spent several hours searching. Most of the countries that visited the Polyclinic this time were in the Middle East, and there were considerable problems in communication, such as using' Poketalk' for Arabic. Many players from countries that do not speak English sometimes questioned how well we understood the intentions of the patients. We will introduce valuable cases at the Poly Clinic, and report on the tendency of the patients.

Keyword 1: Tokyo2020
Keyword 2: Paralympic Games
Keyword 3: COVID19

O4-1

Bicortical laminar screws for posterior fixation of subaxial cervical spine : A radiologic analysis with computed tomography images

Eugene Park, Woo-Kie Min

Department of Orthopedic Surgery, Kyungpook National University Hospital, Daegu, South Kore

Study design: Retrospective radiological analysis.
Objectives: Translaminar screw (TLS) placement is one of the fixation techniques in the subaxial cervical spine. However, it can be difficult to use in the small diameter of the lamina. This study propose a novel bicortical laminar screw (BLS) and analyzed the related parameters using computed tomography (CT).
Methods: Cervical CT images taken at our institution from January 2013 to March 2017 were used for measurement. On the axial images, the maximum screw length (MSL) and trajectory angle (TA) of BLS and TLS were measured, together with the distance from the midline (DM) to the BLS entry point and the lamina width (LW). On the parasagittal images, the height of the lamina (LH) was measured.
Results: MSL of BLS and TLS were 21.00 and 20.97mm, 19.02 and 20.91mm, 18.45 and 21.01mm, and 20.00 and 21.01mm in C3, C4, C5, and C6, respectively. TA of the BLS and TLS were 21.24 and 34.90°, 19.05 and 34.22°, 18.65 and 33.61°, and 18.30 and 34.51° at C3, C4, C5, and C6, respectively. DM were 6.44mm, 5.77mm, 5.68mm, and 6.03mm at C3, C4, C5, and C6, respectively. LW and LH were 3.52 and 12.44mm, 2.87 and 12.49mm, 2.76 and 12.42mm, and 3.18 and 13.30mm at C3, C4, C5, and C6, respectively.
Conclusion: We suggest that BLS fixation is a feasible alternative option for posterior fixation to the lamina of the subaxial cervical spine. It may be especially useful when pedicle screw, lateral mass screw, and TLS are not appropriate.

Keyword 1: subaxial cervical spine
Keyword 2: bicortical laminar screw
Keyword 3: posterior instrumentation

O4-2

Surgical outcome of anterior cervical discectomy and fusion with uncinectomy for cervical spondylotic amyotrophy: A case-series

Eugene Park, Woo-Kie Min

Department of Orthopedic Surgery, Kyungpook National University Hospital, Daegu, South Korea

Study Design: Case series

Objectives: To retrospectively analyze the surgical outcome and related factors of cervical spondylotic amyotrophy (CSA).

Summary of Literature Review: CSA is a rare clinical symptom associated with cervical spondylotic myelopathy or radiculopathy. CSA is characterized by motor weakness accompanied by marked muscle atrophy of the upper limb, and there are no serious sensory deficits or convulsive paralysis. Surgical care is required in some patients with progressive or severe neurological exacerbation.

Materials and Methods: In total, 24 patients underwent operations for cervical degenerative diseases from 2014 to 2021 in our institute. There were 21 men and 4 women. CSA is divided into a proximal type (scapular, deltoid, and biceps), distal type (triceps, forearm, and hand), and combined type. Improvement of the muscle strength of the most atrophic and impaired muscles was divided into 4 grades: excellent, full recovery or recovery of 2 or more grades; good, recovery by one grade; fair, no improvement; and, poor, decreased muscle strength. The surgical results were defined as either favorable or unfavorable.

Results: The average age at the time of the operation was 61.1 years (range, 32–70 years). Proximal, distal, and combined type CSA was present in 17, 4, and 3 patients, respectively. Based on the radiological data, 18 cases of patients demonstrated uncinate process hypertrophy. Anterior cervical discectomy with fusion (ACDF) with at least partial uncinectomy was performed all 24 patients. At the postoperative neurological evaluation, 20 patients (83.3%) had a favorable outcome, and 4 patients had an unfavorable outcome.

Conclusions: Operative outcome of CSA showed was favorable after surgery. In cases with uncovertebral hypertrophy, we recommend performing uncinectomy during ACDF.

Keyword 1: cervical vertebrae
Keyword 2: spinal amyotrophy
Keyword 3: surgical decompression

O4-3

Characteristics of bone microarchitecture in postmenopausal women with fragility fractures

Ko Chiba, Narihiro Okazaki, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

(Purpose)
High-resolution peripheral quantitative CT (HR-pQCT) has enabled us to evaluate the bone microarchitecture of human bone tissue non-invasively. The purpose of this study is to investigate the characteristics of bone microarchitecture in postmenopausal women with a history of fragile fractures.

(Methods)
The subjects were 100 females with a history of fragility fractures (71.0 ± 6.2 years, 60-83 years old) and 100 healthy females with no history of fragility fractures (70.2 ± 6.4 years old, 60-83 years old).
Distal radius and tibia were scanned with HR-pQCT (XtremeCT II, SCANCO Medical AG, Brüttisellen, Switzerland). A total of 31 bone microstructural parameters were measured and compared between the two groups (TRI/3D-BON, Ratoc System Engineering Co., Ltd., Tokyo).

(Results)
Bone microstructural parameters with clear significant differences ($P < 0.01$) in both the radius and tibia were total bone mineral density (Tt.BMD), total bone volume fraction (Tt.BV/TV), trabecular BMD (Tb.BMD), trabecular BV/TV (Tb.BV/TV), connectivity density (Conn.D), structural model index (SMI), degree of anisotropy (DA), inhomogeneity of trabecular network (Tb.1/N.SD), star volume marrow space (V*ms), trabecular skeletal length (TSL/TV).

(Conclusions)
Postmenopausal women with a history of fragility fractures showed deterioration in various bone microarchitectures, especially characterized by decreased trabecular BMD, loss of trabecular connectivity, and cavity formation in trabecular bone.
It is considered that there was a clear difference in trabecular bone because cortical bone tends to be preserved until old age to maintain bone strength, suggesting that trabecular bone might be an image marker for fracture prediction.

Keyword 1: bone microarchitecture
Keyword 2: HR-pQCT
Keyword 3: osteoporosis

O5-1

Clinical analysis of the musculoskeletal tumor cases made different diagnoses between biopsy and surgery

Masato Tomita, Kentaro Nomura, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

[Introduction]
Histopathological diagnosis is thought to be essential for making treatment strategies for malignant tumors. However, we have experienced some cases that could not be diagnosed from biopsy or made different diagnoses between biopsy and surgery clinically.
In this study, we analyzed the cases made different diagnoses between biopsy and surgery focused on clinical results.
[Cases]
From January 2014 to December 2018, we performed 182 cases of biopsy (open biopsy and needle biopsy) in our department.
In this study, we analyzed 92 cases that have taken operation after biopsy focused on operative margins and clinical results.
[Results]
30 cases had discrepancies of diagnoses between biopsy and surgery. We classified those cases, 11 could not make a diagnosis from biopsy, and made diagnosis after surgery, seven could not sample the tumor tissue correctly, six made different diagnoses histologically between biopsy and surgery, five made different diagnoses about benign or malignant between biopsy and surgery, five made different diagnoses about subtypes or gradings between biopsy and surgery. We analyzed the cases who made different diagnoses about benign or malignant, and made different diagnoses about subtypes or gradings about surgical margins and clinical results, because those differences might affect the prognoses of cases.
We performed adequate margins for each case, and there were no adverse effects on the cases, who made different diagnoses between biopsy and surgery.
[Discussions and Conclusions]
From these results, we have to make correct sampling in biopsy based on imaging (ie. MRI, PET/CT) in order to histopathological diagnose. And we have to make treatment strategies based on not only biopsy but also clinical features. We recognized the importance of “Jaffe’s triangle” in order to make correct treatment strategies for malignant tumors from this study.

Keyword 1: musculoskeletal tumor
Keyword 2: biopsy
Keyword 3: pathological diagnosis

O5-2

The utility of clinical genomic profiling in the diagnosis and treatment of sarcomas

Eiji Nakata, Tomohiro Fujiwara, Toshiyuki Kunisada, Toshifumi Ozaki

Department of Orthopedic Surgery, Okayama University Hospital, Okayama, Japan

Purpose: The utility of the comprehensive genomic profiling (CGP) test was not fully analyzed in patients with sarcoma. We examined the detection rate of actionable mutations and the corresponding treatments in patients who underwent comprehensive genomic profiling tests at our hospital.
Patients and methods: From 2019 to 2022, 84 patients with sarcoma underwent CGP at our hospital. We investigated the detection rate of actionable gene mutations, corresponding clinical trials/treatments for insurance coverage, and germline findings associated with hereditary diseases in these patients.
Results: The histological types included leiomyosarcoma in 19 patients, dedifferentiated liposarcoma in 13, and osteosarcoma in 8. Actionable gene mutations were found in 38 (46%) patients, among which domestic clinical trials were available in 27 cases (33%). In 2 patients with inflammatory myofibroblastic tumor, a fusion mutation of *ALK* gene was identified and tumor shrinkage was observed with the ALK inhibitor. Microsatellite instability was detected in one patient with leiomyosarcoma, and tumor shrinkage was observed with an immune checkpoint inhibitor. Although histological diagnosis of extraskeletal myxoid chondrosarcoma was difficult, the *NR4A3-EWSR*1 fusion gene, found in the comprehensive genomic profiling tests, contributed to the final diagnosis. Germline findings were found in 8 patients (10%); one patient with leiomyosarcoma, in whom *BRCA1* pathogenic variants were detected, was found to have breast cancer and pancreatic cancer in the patient's family, and further genetic testing revealed the germline *BRCA1* pathogenic variants.
Discussion: The actionable gene mutations were found in approximately half of the patients with sarcoma by the CGP. These tests also contributed to the identification of the suspected germline findings. The comprehensive genomic profiling test appears to be an important tool in the diagnosis and treatment of sarcomas.

Keyword 1: clinical genomic profiling
Keyword 2: sarcomas
Keyword 3: treatment

O5-3

Efficacy and safety of de-escalation of denosumab for giant cell tumor of the bone

Takuto Itano, Eiji Nakata, Tomohiro Fujiwara, Toshiyuki Kunisada, Toshifumi Ozaki

Department of Orthopedic Surgery, Okayama University Hospital, Okayama, Japan

We aimed to investigate the efficacy and safety of denosumab de-escalation for giant cell tumors of the bone (GCTB). We retrospectively reviewed the medical records of nine patients with GCTB that were either unresectable or resectable, but not those of candidates for resection, who received de-escalated denosumab treatment at our institution between 2014 and 2021. The denosumab treatment interval was gradually extended to every 8 weeks, 12 weeks, and 24 weeks. We assessed the radiographic changes and clinical symptoms during the course of standard and de-escalated denosumab therapy. Denosumab interval was de-escalated after a median of 12 months of a standard 4-weekly treatment. Imaging showed that a good therapeutic response obtained with the 4-weekly treatment was sustained until the 8-weekly and 12-weekly treatment. According to the MD Anderson criteria, GCTB treated with de-escalated denosumab therapy resulted in a complete response in one patient and a partial response in eight patients, which were obtained with standard treatment. During the 24-weekly treatment, two patients remained stable, while one patient developed local recurrence. The extraskeletal mass reduced significantly with standard treatment, while tumor reduction was sustained during de-escalated treatment. The clinical symptoms significantly improved with standard treatment and remained improved during de-escalated treatment. In conclusion, de-escalated treatment of denosumab has clinical benefits as a maintenance treatment in patients with unresectable GCTB.

Keyword 1: giant cell tumors of the bone
Keyword 2: denosumab
Keyword 3: de-escalation

O5-4

Parosteal lipoma arising in paravertebral muscle: A case report

Saki Shiraishi, Masato Tomita, Kentaro Nomura, Makoto Osaki

Department of Orthopaedic Surgery, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Introduction: Parosteal lipoma is very rare benign tumor, accounting for less than 0.3% of all lipomas.
Case presentation: A 69-year-old healthy man had a painless mass in his back. Magnetic resonance imaging (MRI) showed a well-marginated soft tissue tumor with a diameter almost 8cm, mainly a fat intensity lesion with a small part of necrosis inside in paravertebral muscle. ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography-computed tomography (PET-CT) scans showed calcification, but no significant FDG uptake was seen. Marginal excision was undergone for diagnosis and treatment. The pathological diagnosis was parosteal lipoma without malignancy. He didn't have any recurrence 12 months after surgery.
Conclusion: We presented a rare case of parosteal ossifying lipoma in paravertebral muscle, along with a review of the related literatures.