Free Paper Session IX: Rehabilitation, Oncology, Others

FP9.1

Giant Cell Tumour of the Extremity: 10-Year Follow-up to Determine the Risk Factors of Local Recurrence after Curettage and Adjuvant Bisphosphonates

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FP9.2

Rapidly Progressive Avascular Necrosis of the Hip Joint: Too Important to Miss!

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Introduction: Avascular necrosis (AVN) is the most common aetiology leading to total hip arthroplasty in Hong Kong. A subset of AVN patients exhibit alarmingly rapid disease progression with significant collapse of the femoral head or acetabular erosion. Our objectives were to identify the incidence of rapidly progressive AVN (RPAVN), radiologically characterise and define RPAVN, and evaluate if any of these patients had underlying septic arthritis.

Methods: This retrospective study evaluated 147 cases of AVN out of 572 patients who were on the waiting list for total hip arthroplasty in Hong Kong West Cluster between January 2014 and June 2019. Radiographs, investigation results, and clinical notes were reviewed. We defined RPAVN as a collapse of the femoral head of ≥25% or acetabular erosion within 6 months.

Results: In all, 23 hips in 20 patients met our radiological criteria for RPAVN (15.6%). Within the timeframe, 11 cases had complete collapse of the femoral head and 13 cases had acetabular erosion. Preoperative joint aspiration was performed in 13 hips and intra-operative tissue culture was performed in 12 hips, but all cultures were negative. Steroid and alcohol use were identified in 17.4% and 13.0% of these patients, respectively. Fifteen cases had total hip arthroplasty done, with five requiring acetabular reconstruction using either bone graft or metal augment.

Conclusion: Rapidly progressive avascular necrosis is a distinct hip pathology that requires early surgical intervention after exclusion of infection to prevent rapid functional deterioration and increasing surgical difficulty.

FP9.3

Positive Psychological Intervention for Osteoarthritis: Identifying Positive Traits Associated with Physical and Psychological Well-being

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FP9.4

Functional Analysis of Cell Sub-populations Found in Chondrosarcoma

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FP9.5

Raman Spectroscopy-based Classification Model to Discriminate Bone Tumours from Non-tumorous Tissue: A Pilot Study

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Introduction: Osteosarcoma (OS) is one of the most common cancers in adolescent patients. Diagnosis of OS is made by imaging studies including X-rays, magnetic resonance imaging, computed tomography, and positron emission tomography scans. The diagnosis can only be confirmed by histopathological examination of biopsy tissues, but this is subjective and depends on morphological changes in the specimens. Raman spectroscopy is based on the inelastic scattering property of photons to determine vibrational modes of molecules and can provide a structural fingerprint for specific functional groups of molecules. Therefore, biological molecules with distinct chemical and molecular features such as DNA, proteins and lipids can be identified. We have previously reported the use of Raman spectroscopy for grading of malignancy in OS cells (Stem Cell Res Ther 2015). This study aimed to further apply Raman spectroscopy for developing a classification model to discriminate bone tumours from non-tumorous tissues.

Methods: Raman spectra were acquired on formalin-fixed paraffin-preserved specimens including OS, giant cell tumour of bone (GCTB), and GCTB-paired normal tissues with a confocal Raman microscope using an excitation wavelength of 785 nm.

Results: Significant spectral differences were observed between OS and GCTB, and GCTB and paired normal tissues. Specific Raman shifts (cm-1) including 779 (uracil), 829 (DNA), 929 (amino acids), 962 (hydroxyapatite), 1309 (lipid/collagen), 1449 (proteins/lipids), 1554 (amide II), and 1608 (cytosine) were discovered in OS specimens, whereas 815 (nucleic acids), 920 (proline), 935 (valine), and 1450 (CH2 bending mode in malignant tissues) in GCTB specimens.

Conclusion: This pilot study demonstrates the potential application of Raman spectroscopy for histopathological diagnosis of bone tumours.

FP9.6

Effective and Sustainable Method to Decrease Pain and Improve Quality of Life for Symptomatic Adult Scoliosis

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Introduction: Spinal deformity has a significant impact on quality of life (QOL). Except for idiopathic scoliosis, 15% to 30% of normal adults also develop degenerative scoliosis. The prevalence of adult scoliosis (ADS) ranges from 8.3% to 68%. Among patients with ADS, 61% develop spinal pain. The Schroth method is a wide asymmetrical trunk exercise therapy originated proven effective for treating adolescent idiopathic scoliosis. However, few studies have investigated its effectiveness in treating ADS. This study aimed to evaluate the effectiveness of Schroth method for ADS in terms of pain, functional tolerance, and QOL.

Methods: Patients aged 19 to 65 years with scoliosis and spinal pain without operation were recruited and followed up for at least 12 months. Patients were treated in Tang Shiu Kin Hospital from October 2016 to June 2018 using the Schroth method, including specific postural exercise, breathing patterns, and home exercise. Wilcoxon signed rank test was used.

Results: A total of 32 patients (mean age 39.9 years, 81.3% female) were recruited. Three subjects dropped out (n=29). There was overall 69% improvement after nine sessions. Pain decreased from 4.8 to 2.0 (p=0.000). Functional tolerance in sitting or walking improved from 74 minutes to 129 minutes (p=0.000). Scoliosis Research Society–22 Patient Questionnaire improved including function (4.2/5 to 4.6/5; p=0.009), self-perceived image (3.2/5 to 3.6/5; p=0.000), and mental health (3.5/5 to 4.0/5; p=0.000). At 12-month follow-up, there was further improvement to 76.4% (p=0.025) and pain decreased to 1.2 (p=0.004). Functional tolerance further improved to 158 minutes (p=0.044).

Conclusion: The Schroth method was effective in decreasing pain, improving functional tolerance, and sustaining QOL for patients with ADS. It can be a new approach to rehabilitation for patients with ADS.

FP9.7

Continuous Perioperative Warming to Reduce Incidence of Inadvertent Perioperative Hypothermia in Joint Replacement Patients

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Introduction: Inadvertent perioperative hypothermia (IPH) with core temperature below 36°C is not uncommon because of the thermal redistribution during anaesthesia. It is associated with surgical site infection, bleeding, and postoperative pain. A recent survey showed the local incidence of IPH was 38.9%. Evidence from literature review suggested actively prewarming for 20 to 30 minutes before operations is an effective way to reduce the prevalence of IPH. The aim of the study was to identify if preoperative warming 20 to 30 minutes before anaesthesia could maintain a body temperature above 36°C upon arrival to post-anaesthesia care unit (PACU) for patients undergoing total joint replacement (TJR).

Methods: A retrospective analysis was performed to evaluate the effectiveness of prewarming on hypothermia in TJR patients. Patients were actively prewarmed by forced air device for at least 20 minutes before surgery. The on-arrival tympanic temperature in PACU was compared between two periods: before implementation (conventional group: March 2018-May 2018) and after implementation (prewarming group: June 2018-August 2018).

Results: A total of 114 patients undergoing TJR were included. A total of 61 patients were in the conventional group and 53 patients were in the prewarming group. There was statistically significant difference in the incidence of IPH (conventional group: 24.6%; prewarming group: 9.4%, p=0.034).

Conclusion: The above results suggested that preoperative warming reduces the incidence of IPH in joint replacement patients.

FP9.8

Three-dimensional Printing Technology in Preoperative Planning of Musculoskeletal Tumour Surgery

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FP9.9

Differences in Physical Performance among Unilateral Transtibial Amputees (Functional Level K2 versus K3): A Cross-sectional Study

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Introduction: Falls are common among lower limb amputees. An improved understanding and evaluations of stability among this population of high fall risk are therefore important. This pilot study evaluated the difference in static and dynamic balance with gait analysis in amputees between different functional levels using Brief Balance Evaluation Systems Test (Brief BESTest).

Methods: Participants performed Brief BESTest and walked on level ground with F-Scan™ gait analysis system. Test score, centre of pressure deviations in sagittal and mediolateral directions derived from F-Scan™ pressure-sensing insoles, walking speed, and symmetry ratio between prosthetic limb (PL) and sound limb (SL) were analysed.

Results: In all, 14 unilateral transtibial amputees, 6 K2 level, and 8 K3 level were recruited. Significant differences between PL and SL of all participants were found in single leg stance, double leg stance, and dynamic walking in sagittal direction. Significant differences between K2 and K3 groups were found for test score, walking speed, PL centre of pressure deviations in single leg stance and dynamic walking (in sagittal direction) and symmetry ratio in dynamic walking (in sagittal and mediolateral directions).

Conclusion: Differences in walking speed, static and dynamic stability, and gait symmetry between limbs in K2 and K3 unilateral transtibial amputees are highlighted. Gait responses to static and dynamic conditions of amputees are objectively reflected by Brief BESTest and F-Scan™ gait analysis. For clinical assessment of fall risk and balance ability, the Brief BESTest can be further modified specific for amputees.

FP9.10

Back to Community and Being Active Again: Exercise Training Programme for Patients with Knee Osteoarthritis

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Introduction: Since 2016, a Comprehensive Osteoarthritis ManagEment (COME) programme for patients with knee osteoarthritis (OA) was launched in our centre. The COME programme consists of a 3-hour education session, 12 physiotherapy exercise sessions, and six occupational therapy sessions of coping skills. This study reviews the results after 1 year.

Methods: Patients with radiological stages of Kellgren-Lawrence Grade I to III were recruited and assessed at baseline, 6 weeks, 3 months and 1 year with telephone follow-up evaluation. The following outcomes were assessed: physical performance with 1-minute chair-stand test and both quadriceps strength with dynamometer; pain on walking or stairs climbing; weekly time on physical activities and exercise training; functional status with Patient Specific Function Score (PSFS); self-efficacy with Self-Exercise Efficacy (SEE) score; and health with EuroQol visual analogue scale (EQ-VAS) score.

Results: A total of 100 patients completed the programme and 1-year follow-up evaluation. Significant outcome improvements were observed: the 1-minute chair-stand test increased by 13.2 ± 11.7 repetitions, quadriceps strength increased by 6.4 ± 8.7 kgf and 6.9 ± 8.2 kgf in right and left side, respectively, at 3 months ($p<0.001$). Pain was reduced by 1.3 ± 2.6 points, time spent on physical activities and training increased from 43.2 ± 45.0 to 85.3 ± 113.5 minutes, PSFS improved by 3.8 ± 2.7 points, SEE improved the greatest by 13.5 ± 19.0 points, and EQ-VAS improved by 8.8 ± 21.1 points at 1 year ($p<0.001$). Also, 80% of patients reported they would continue physiotherapy exercises at public fitness facilities.

Conclusion: The COME is effective to improve patients' physical performance, quality of life, and self-efficacy to maintain exercise habit.

FP9.11

Incidence of Rapid Destructive Osteoarthritis of Hip

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Introduction: Rapid destructive osteoarthritis (RDOA) of hip is a diagnosis by exclusion. It can mimic infection and Charcot joints. The present study aimed to review the incidence of RDOA among those patients scheduled for total hip arthroplasty (THA) for end-stage arthrosis.

Methods: A retrospective review of radiographs of all patients scheduled for THA from 2010 to 2018 were analysed by three orthopaedic specialists based on radiographic criteria. The clinical presentation, radiological findings, cultures, and pathology were reviewed.

Results: During the 9-year period from 2010 to 2018, 171 THAs were scheduled for 147 patients. Rapid destruction of hip occurred in 31 hips of 25 patients. Eight hips of four patients were excluded as RDOA: two patients had bilateral septic hip arthritis, one patient had systemic lupus erythematosus arthritis, and another patient had bilateral neuropathic hips. Twenty-two hips of 20 patients fulfilled the diagnostic criteria of RDOA. Another patient had unusual presentation and might well be RDOA as well.

Conclusion: The RDOA of hip represents an uncommon subset of arthrosis with rapid progression. Differentiation of RDOA from septic arthritis and neuropathic joint is of paramount importance in the planning of THA. The exclusion of infection or neoplasm in a rapid destruction of hip may be difficult as illustrated by our cases. A dedicated balance between correct diagnosis and early operation should be exercised to prevent rapid loss of bone stock, which will make delayed THA technically difficult with possible compromised outcomes.

FP9.12

Prevalence of Chronic Injuries among Cantonese Opera Performers in Hong Kong: A Pilot Study

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Introduction: Cantonese opera performers (CoPs) are stage performers who engage in skills and martial arts that require a high level of body coordination and gymnastic movement. This study is to evaluate the prevalence of injury among CoPs.

Methods: Forty CoP subjects (28 males, 12 females) were recruited randomly from community and professional Cantonese opera groups based on their character roles of 'Mou (武)', 'Wei (文)', and 'Special role' ('Cau'丑生, 'Sou'鬚生)'. The Nordic Musculoskeletal Questionnaire, Oswestry Disability Index, and visual analogue scale (VAS) were used to evaluate their reported injury prevalence and pain intensity. Ethics approval and informed consent were obtained.

Results: Of all the subjects, 57.5% were professional CoP, 12.5% were freelance CoP, and 30% were amateur CoP. The mean number of years as a CoP was 10.05 ± 7.8 years. In all, 75% of CoPs reported lower trunk injuries due to intense legwork training; 87% of the 'Mou' CoPs reported lower back pain (VAS=5.0 ± 2.3). 36.4% of 'Wei' CoPs reported pain in shoulders, lower back and lower limbs (VAS=4.0 ± 3.5). 66.7% of 'Special role' CoPs reported past injuries in shoulders, lower limbs, and ankles (VAS=3.0 ± 1.5).

Conclusion: This pilot study indicated that lower trunk injuries were the most common injuries in CoP. Results show important implications for further investigation on prevention and/or alleviation of stage injuries.

FP9.13

Effectiveness of Osteoporosis Awareness in Hong Kong: Evaluation Using Digital Platforms

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Introduction: Owing to the ageing population in Hong Kong, osteoporosis is a common fracture-causing disease that affects quality of life and can lead to earlier death. This study aimed to evaluate the effectiveness of osteoporosis awareness in digital channels and identify the elements that may promote osteoporosis disease awareness in the internet.

Methods: Participants were recruited randomly from digital channels to complete an online survey to test their understanding of internet usage and osteoporosis knowledge on three areas including the osteoporosis risk factors, types of exercises, and calcium intake. Ten participants aged between 21 to 69 years were selected at random from the subjects' pool to receive an individual interview after the online survey period.

Results: In all, 552 participants aged ≥19 years were recruited. Overall median osteoporosis knowledge test (OKT) score was 53.8%. Subjects with higher education levels showed higher OKT scores. Women showed higher score than men, whereas there was no age-related difference in score. Online newspaper and magazine, WhatsApp, and Facebook were rated high in usage. Short videos or promotion during dramas or shows with interesting contents were effective in promoting osteoporosis awareness and prevention.

Conclusion: The perceived threat to the public is essential in raising osteoporosis awareness. Interventions derived from Health Belief Model could integrate digital platforms to increase perceived benefits and threats, so as to reduce barriers comparing traditional interventions. Different channels targeting different age groups are also identified.

FP9.14

Quality of Life and the Time Course of Physical Recovery of Two Rehabilitation Protocols (Extension Rehabilitation versus Traditional Rehabilitation) in Total Knee Arthroplasty for Patients with Preoperative Fixed Flexion Deformity: A Randomised Controlled Trial

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Introduction: This was the first study in Hong Kong Chinese population to evaluate the time course of recovery of impairments and function after unilateral total knee arthroplasty.

Methods: This was a paired single-blind randomised controlled trial. Patients were randomised into intervention and control groups. The intervention group were treated with protocol of quadriceps strengthening in adjunct to usual rehabilitation. Patients were assessed preoperatively, postoperatively at 6 weeks, 3 months, and 6 months. Outcomes assessed included: pain at movement and walking, range of active and passive knee extension and flexion, and strength of knee extensors and flexors. Timed up-and-go test, 6-minute walk test, time of stairs management, Knee injury and Osteoarthritis Outcome Score, Knee Society Knee Score, and Knee Society Function Score were used.

Results: Twenty patients (mean age, 77.1 ± 6.2 years) were included. Their baseline data were comparable. For pain, there was a significant reduction at 6 weeks in both groups. For physical capacity, early differences were detected in only the control group at active and passive knee ranges but both groups improved at 3 months. Knee extensor strength improved in the intervention group at 3 months but there was no improvement in the knee flexors strength for both groups. For ambulation, the intervention group improved at 3 months but both groups improved at 6 months. For quality of life, both groups improved at 3 months.

Conclusion: The differences in recovery pattern of both groups may be related to multiple factors that need further evaluation.

FP9.15 *Indian Orthopaedic Association Ambassador Paper*

Triple Antibiotic–Loaded STIMULAN for Chronic Osteomyelitis in Rural Setting: A Prospective Multicentre Study of 38 Patients

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Introduction: The development of osteoarticular infection can represent a significant challenge to the surgeon and distress to the patient, often resulting in multiple surgical procedures.

Methods: This is a prospective study on 38 patients with established chronic osteomyelitis at three centres from 2016 to 2018. All patients underwent sequestrectomy, debridement, saucerisation, and STIMULAN (mixed with vancomycin, tobramycin, and gentamycin) in a single sitting. All patients received systemic antibiotics for 4 days and oral antibiotics for 4 to 6 weeks and were followed up for ≥12 months.

Results: Mean follow-up duration was 12 ± 3 months. In all, 36 patients became pus discharge–free after surgery. Significant improvement was noted in general and local wound condition (redness, warmth and tenderness, fever) at 2 weeks. Mean suture removal time was 18 days and STIMULAN absorption time 78 days. Also, 22 patients had serum discharge from wounds, reduced over time by 2 weeks in all patients; 14 patients required secondary skin closure; and 6% recurrence after surgery at 12 months was found.

Conclusion: Problems associated with chronic osteomyelitis patients include social unacceptability, financial burden from previous surgeries, antibiotic resistance, depression, and seeking guarantee for pus-free life. Successful outcome warrants aggressive dead bone removal, local tissue control with local antibiotic concentration maintenance. STIMULAN has promising results when mixed with triple antibiotics (vancomycin, tobramycin, and gentamycin). STIMULAN provides local antibiotic concentration over time with additional benefits of dead space management, auto-absorbable, thus allowing aggressive debridement and dead bone removal.

FP9.16 *British Orthopaedic Association Ambassador Paper*

Dupuytren's Disease above the Wrist

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Dupuytren's disease is a benign fibroproliferative disorder characterised by the development of nodules and cords in the palmar and digital fascia. We present the largest series of patients with Dupuytren's disease proximal to the wrist crease that has been reported and propose a classification based on our clinical findings in these patients. Hueston recognised that ectopic Dupuytren's deposits may occur above the wrist about the palmaris longus (type I) or the insertion of flexor carpi ulnaris (type II). Reports of Dupuytren's disease involving the volar wrist are extremely rare with only a handful of cases published. Between 2000 and 2019 we diagnosed 11 patients with Dupuytren's disease above the wrist, carefully logging their disease progression together with any association to disease at ectopic sites. Our series includes six men and five women, despite the classic association with male sex. Mean age at presentation was 58 years. Patients had either type I or type II disease. Seven patients had bilateral symmetrical disease. Six patients have undergone surgery to address the disease at the wrist, with histological evidence to support the diagnosis. Four patients with type II disease had a modest restriction of radial deviation. However, no patients demonstrated compressive neuropathies resulting from disease. We present the largest case series to date of patients with Dupuytren's disease above the wrist. We propose that type II disease is associated with more aggressive disease and suggest that Dupuytren's proximal to the wrist is not as rare as the literature would suggest.