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General Summary

Basic Research

Our studies on bone metabolism and osteogenesis have been highly acclaimed both in Japan and abroad. Our research on mobility at the intercuneiform joint has played a pioneering role in the field of foot surgery. Our clinical research focuses on the relationship between systemic disorders, such as life-style related diseases and aging, and bone disease.

Clinical Research

Our clinical practice has been divided into 10 subspecialties to treat a wide range of musculoskeletal disorders and is managed by different specialist teams: knee joint, hip joint, spine, shoulder joint, foot surgery, trauma, osteoporosis, rheumatic diseases and sports. All teams maintain a high level of expertise and are actively involved in scientific activities.

Research Activities

Long-term results of Modified Inferior Capsular Shift procedure (MICS) for recurrent dislocation of the shoulder

Long-term clinical results of modified inferior capsular shift (MICS) procedure for recurrent dislocation of the shoulder were reviewed. The study consisted of 17 patients with their average age at surgery of 30 years (follow-up ratio, 47%), and an average follow-up period of 12 years and 6 months. The recurrence was observed in one judo teenage player. The ratio of returning to previous sports activity was 94%. No recurrence was observed in patients who had a large Hill-Sachs lesion or general joint laxity. MICS procedure including capsular shift with 30 to 40 degrees of external rotation produced satisfactory long-term results with less limitation in range of motion.

Current developments and ongoing studies

Apart from Dupuytren's contractures, we treat many other diseases: from traumatic injuries such as fractures, tendon ruptures and neurovascular injuries to degenerative disorders and tumors. Additionally, we perform highly specialist surgical procedures including tendon suturing and microsurgery.

Sacroiliac joint (SIJ) degeneration in elderly patients who underwent surgical treatment for a lumbar lesion

We evaluated a degree of sacroiliac joint (SIJ) degeneration using CT images in elderly patients who had undergone surgical treatment for a lumbar lesion. In over 90% of patients, some degree of SIJ degeneration was observed. It was particularly strong in patients with hyperostotic changes in the thoracic vertebrae where SIJ degenerations were noticeable, and in some cases it included SIJ ankylosis.Our findings suggest that hereditary and/or biomechanical factors affect degeneration of the sacroiliac joint.

Two-stage treatment of chronic peri-prosthetic joint infection with retention of a well-fixed and well-functioning cement-less stem

The clinical course of 6 patients treated for chronic peri-prosthetic joint infections (PJI) without stem removal was examined. The first-stage surgery involved acetabular cup removal and reconstruction by filling the acetabular defect with antibiotic-loaded acrylic cement and creating a socket-like hemispherical dent. After confirming that infection had been eradicated, the second-stage acetabular reconstruction was performed. Results: Patients underwent active range-of-motion and ambulation exercises between two surgeries. One patient died of an unrelated non-infective cause 1 year postoperatively; 5 patients had good functional outcomes and radiographic findings with no PJI recurrence.

Accuracy of CT-Based Navigation-Assisted Total Knee Arthroplasty and Anterior Cruciate Ligament reconstruction with an originally designed retro-rectangle dilator

CT-based navigation system (CTNS) is one of the computer-assisted surgical systems available for total knee arthroplasty. We focused on the accuracy of component orientation and postoperative alignment with CTNS compared to a conventional technique using outliers data. Our results demonstrated that CTNS significantly improved both parameters.

We developed a new technique of making bone tunnels with a rectangular retro-dilator. Although only few patients have been followed-up for sufficient periods, our procedure provides safer and easier approach for anatomical rectangular anterior cruciate ligament reconstructions.

Evaluation of mobility at the articulation between medial and middle cuneiforms using a 3D analysis system and weightbearing CT in normal versus hallux valgus patients

We measured the three-dimensional displacement of the middle cuneiform relative to the medial cuneiform under weightbearing conditions and compared data between hallux valgus and control groups. Displacement by dorsiflexion and inversion was significantly greater in the hallux valgus group. It may be possible to further improve postoperative outcomes of the Lapidus procedure through arthrodesis of the intercuneiform 1-2 joint also in patients with severe hypermobility of this joint.

Bone metabolism team: current developments and ongoing studies

In our outpatient clinic specializing in bone metabolism, we provide personalized treatments using simultaneous estimation of bone quantity and bone quality. Our clinical

research focuses on the relationship between systemic disorders such as life-style related diseases and aging, and bone disease. In basic research, we examine hard tissue properties in mucopolysaccharidosis-model mice and analyze epigenetic modifications of giant cell tumors. In the giant cell tumor cells we found a novel mutation in the H3.3 histone.

Publications

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