Department of Orthopaedic Surgery
Division of Sports Medicine

Keishi Marumo, *Professor* Hiroki Funasaki, *Associate Professor*

General Summary

Clinical Research
The ongoing research in our department concentrates on competitive athletes (including professionals), amateurs who include sports activities in their daily lives, and young athletes practicing sports in school sports clubs or dedicated to training within sports clubs. This outline focuses on the basic research performed in 2012.

Research Activities

Comparison of muscle potential silent periods between operated and nonoperated sides in patients after reconstruction of the anterior cruciate ligament
The purpose of this study was to compare motor unit functional variables — premotion time, premotion silent period, and switching silent period — between operated and nonoperated knees in patients following reconstruction of the anterior cruciate ligament. Six patients were enrolled. They were examined at postoperative follow-up, 8 to 12 months after the surgery. Electromyographic data of the rectus femoris and biceps femoris muscles were recorded during jumping: the patients were asked to jump on one leg as quickly as they could in response to a flashing light. Although there was no significant difference in premotion time between the operated and the nonoperated sides, the premotion silent period and the switching silent period were significantly longer on the operated side than on the nonoperated side. The results suggest that the nerve-muscle coordination on the operated side deteriorates 8 to 12 months after reconstruction of the anterior cruciate ligament. The silent period has been suggested to be a useful variable for assessing motor unit function in athletes undergoing rehabilitation and has been proposed as a tool for guiding the return to sports activity.

Three-dimensional gait analysis in patients with bilateral knee osteoarthritis before and after total knee arthroplasty
The purpose of this study was to compare the data of 3-dimensional gait analysis with a motion analysis system (Vicon Motion Systems, Ltd., Oxford, UK) in 12 patients with bilateral knee osteoarthritis who had undergone bilateral total knee arthroplasty.
Analyzed variables were: 1) step length, 2) walking speed, 3) percentage of single-leg support phase, 4) ground force during the single-leg support phase, 5) step width, and 6) range of motion of the hip, knee, and ankle joints. Step length, walking speed, percentage of single-leg support phase, ground force during the single-leg support phase, and range of motion improved significantly in patients who had preoperative Japanese Orthopaedic Association scores of 60 points or more. On the other hand, in patients with

scores of less than 60 points, significant improvements were not observed. We conclude that various gait variables improve after total knee arthroplasty, although patients with severe osteoarthritis (Japanese Orthopaedic Association score of less than 60 points) showed less improvement in walking ability.

The results of Bankart repair and the usefulness of a rehabilitation program we designed for the return of students to sports

We studied clinical characteristics and results of Bankart repair in 36 patients (students engaged in some sports activity) with recurrent dislocation of the shoulder and evaluated the usefulness of a rehabilitation program we developed for their return to sports after surgery. In most patients, the initial dislocation had occurred during sports activity. Patients underwent surgical treatment after dislocation had recurred 3 or 4 times. Many patients continued their sports activity after surgery, and their return to sports was facilitated by introduction of our rehabilitation program.

Pain of the anterior superior iliac spine in junior-high and high school soccer players

We reported on 3 patients who had pain in the anterior superior iliac spine (ASIS) area while playing soccer. Magnetic resonance showed high signal intensity in the bone marrow, apophysis, epiphyseal line, and the attaching muscles. We speculated that these high signal intensities were caused by chronic stress in the muscles attaching to the ASIS and that lesions might act as triggers leading to ASIS avulsion fracture.

Publications

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