

Department of Orthopaedic Surgery

Division of Sports Medicine

Keishi Marumo, *Professor*

Hiroki Funasaki, *Assistant 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 engaged in school sports clubs or dedicated to training within sports clubs. Since 2010, we have also focused on issues related to sports injuries in elderly athletes.

Research Activities

Three-dimensional motion analysis of the pelvis during soccer kicks

We performed 3-dimensional motion analysis of the pelvis during soccer kicks using a 200-Hz motion analysis system (Vicon Motion Systems, Oxford, UK) to evaluate the mechanical stress around the pelvis. Mechanical stress to the hip adductor muscles during the infront kick was greater than that during the instep kick. In addition, during the infront kick, mechanical stresses to those muscles were greater if the kickers did not use their upper extremities. We speculate that the infront kick without the use of the upper extremities might contribute to injuries of the hip adductors.

Three-dimensional gait analysis in patients with bilateral knee osteoarthritis before and after unilateral 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) in 26 patients with bilateral knee osteoarthritis who had undergone unilateral total knee arthroplasty. Analyzed variables were: 1) step length, 2) walking speed, 3) percentage of the gait in the single-limb support (SLS) phase, 4) ground force during the SLS phase, 5) step width, and 6) range of motion of the hip, knee, and ankle joints. Step length, walking speed, percentage of the gait in the SLS phase, ground force during the SLS phase, and range of motion improved significantly in patients with a Japanese Orthopaedic Association score of 60 points or more for the side not operated on. On the other hand, patients with a score of less than 60 points showed no improvement in the aforementioned variables. We conclude that various gait variables improve after total knee arthroplasty, although patients with severe osteoarthritis (on the side not operated on) showed no improvement in their walking ability.

Comparison of core muscle strength between baseball players and soccer players

We compared core muscle strength between baseball players and soccer players. The subjects were 20 players of each sport, with an average age of 16 years. The lengths of time the subjects could maintain the lower limb in the “bench” and “sideways bench”

positions were measured. The times for both the bench and sideways bench positions were significantly longer for soccer players than for baseball players. We conclude that these differences were caused by the characteristics of these sports.

Treatment of elder athletes in our clinic

We evaluated 597 patients who were older than 40 years and had visited our clinic for the past 3 years. The majority of the patients suffered from osteoarthritis of the lumbar spine or knee joints. They were treated with injections of hyaluronic acid or medication or both. In addition, athletic rehabilitation, such as exercises to increase range of motion and balanced training, were also applied and were useful in this patient group. Rehabilitation should be continued even after the return to their sports activities.

Fracture dislocation of the Lisfranc joint in a young soccer player

We reported a rare case of fracture dislocation of the Lisfranc joint with the fracture of the first cuneiform. The mechanism of this injury was investigated.

A report of a cycle racer associated with myasthenia gravis who resumed professional racing

We reported on a cycle racer who had myasthenia gravis, was treated with muscle training during hospitalization, and finally returned to professional racing.

Publications

Funasaki H, Yoshida M, Kan I, Kato S, Morohashi M, Kasama K, Marumo K. Arthroscopic Bankart repair for recurrent shoulder dislocation in patients over 40 years of age (in Japanese). *Katakansetsu* 2010; **34**: 355-8.

Yoshida M, Funasaki Y, Kan I, Kato S, Kasama K, Marumo K. Gene expression analysis for thick subacromial bursae accompanied with rotator cuff tear (in Japanese). *JOSKAS* 2011; **36**:

22-3.

Reviews and Books

Funasaki H. Case presentation —my opinion— (in Japanese). In: Tamai K, editor. Proximal humeral fracture. Tokyo: Kanehara Shuppan; 2010. p. 166.