

Department of Orthopaedic Surgery

Division of Sports Medicine

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General Summary

Clinical Research

The ongoing research in our department concentrates on competitive athletes (including professional athletes), amateur athletes who include sports activities in their daily lives and young athletes engaged in school sports clubs or dedicated to training within sports clubs. In 2017 we have been mostly focused on basic research.

Research Activities

Review of post-operative treatment protocol after reconstructive surgery of anterior cruciate ligament (ACL) — Insights based on nerve-muscle coordination —

Recovery of nerve-muscle coordination is one of the most important factors at the time of returning to sports activities after ACL reconstruction surgery. However, the methods to assess nerve-muscle coordination has not been established. We measured switching silent period (SSP) and pre-motor time (PMT) in patients who had received reconstructive surgery of ACL. Our findings indicated that PMT was not significantly different between operated and non-operated sides. In contrast, SSP on the operated side was significantly longer than that on the non-operated side. Our results suggest that SSP can be a useful indicator when evaluating the nerve-muscle coordination following ACL reconstruction. We conclude that SSP measurement should be incorporated into post-operative treatment protocols in patients after ACL reconstruction surgery.

Evaluation of nerve-muscle coordination with switching silent period (SSP) and its correlation with subjective symptoms in patients following anterior cruciate ligament (ACL) reconstructive surgery: Outcomes at one month after return to sports activities

Nerve-muscle coordination was evaluated using switching silent period in patients who had undergone reconstructive surgery of ACL at one month after returning to sport activity. Pre-motion time (PMT) did not show any significant differences between operated and non-operated sides, however switching silent period (SSP) on the operated side was significantly longer than that on the non-operated side. SSP was significantly and directly correlated with subjective anxiety experienced during sport activities. Our results suggest that nerve-muscle coordination on the operated side was decreased even after one month following return to sport activities and it was reflected by the subjective anxiety about the knee joint condition felt by patients during sport activity.

Arthroscopic surgery for fracture of the lateral process of the talus (LPT)

We discuss the effectiveness of arthroscopic surgery for LPT fractures in 2 patients: an

11-year-old boy (case 1) and a 22-year-old woman (case 2). According to the Hawkins classification, the fracture types were the old type II and type I, respectively. The surgery consisted of excision of bone fragments in case 1, and reduction and internal fixation (RIF) in case 2. In case 1, the patient could return to soccer training at 5 weeks after surgery. In case 2, a complete bone union was obtained at 8 weeks after surgery. The arthroscopic surgery for LPT fracture is a minimally invasive procedure, it allows additional observation of other possible fracture complications during surgery, and it is useful for bone fragment excision and RIF in dislocated type I fractures.

Arthroscopic resection of bone fragments after delayed union of posterior talar process fracture developed in a youth soccer player: A case report

We report a 14-year-old soccer player who had developed a delayed union of posterior talar process fracture and underwent arthroscopic resection of the bone fragment. The complete remodeling of the talus was obtained. He returned to soccer training at 4 months following surgery. A CT scan taken every one year after the operation revealed that remodeling of the talus occurred 2 years after surgery. The arthroscopic resection of bone fragments is useful for this type of fracture in young athletes.

Publications

Funasaki H, Saito M, Mizumura MK, Hayashi T, Marumo K. Bone quality in female ballet dancers:

A possible determinant of bone health. *Open Journal of Orthopedics*. 2017; **7**: 285-94.