

Department of Orthopaedic Surgery Division of Sports Medicine

Keishi Marumo, *Professor*

Hiroki Funasaki, *Associate Professor*

General Summary

Clinical Research

In our ongoing research we focus 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. We have incorporated basic research since 2013.

Research Activities

Bone quality in female ballet dancers

We investigated bone quality-related markers by measuring serum levels of homocysteine and pentosidine, bone metabolic markers, and bone mineral density (BMD) in 13 elite female ballet dancers (average age, 22 years) to evaluate a possible correlation between amenorrhea or fatigue fracture or both. Two dancers had a history of a fatigue fracture, and 3 had a history of secondary amenorrhea. Although none had abnormal BMD, serum levels of bone alkaline phosphatase, tartrate-resistant acid phosphatase 5b, and homocysteine, in 2 of the 3 dancers with a history of secondary amenorrhea had abnormally high levels of serum pentosidine. We speculated that oxidative stress related to an increased mechanical load might lead to impaired estrogen secretion, which eventually affects bone quality. We speculated that latent bone quality deterioration might develop in female athletes with secondary amenorrhea but otherwise normal BMD values.

The silent period in patients who had conservative therapy for anterior cruciate ligament injury: Comparison between the affected and unaffected knees

The purpose of this study was to compare pre-motion time, the pre-motion silent period, and the switching silent period, motor unit functional parameters, between affected and unaffected knees in patients who had received conservative treatment for anterior cruciate ligament (ACL) tear. Seven patients were enrolled. They were examined at an average of 6 months after the injury. There were no significant differences in the pre-motion time, the pre-motion silent period, and the switching silent period between the affected and the unaffected sides. A previous study demonstrated that the pre-motion silent period and the switching silent period on the operated side were longer than those on the unoperated side in patients after reconstruction surgery for the ACL tear. Our results suggest that the nerve-muscle coordination in conservatively treated patients might recover more quickly than in patients treated with surgery.

Muscle strength after reconstructive surgery for ACL tear

Muscle strength of the quadriceps and hamstring muscles in 60 patients was measured 4 and 8 months after reconstructive surgery for an ACL tear. Muscle strength on the operated side increased significantly between 4 and 8 months after surgery with a constant quadriceps:hamstrings ratio. However, patients with marked muscle weakness at 4 months did not acquire sufficient muscle strength by 8 months. More exercises during rehabilitation or a delay in sports activities or both are necessary in these patients.

Rotational range of motion of the shoulder joint in patients with throwing pain

We used ultrasonography to measure the 2nd rotational range of motion of the shoulder after exclusion of the humeral head retroversion angle (the true rotational range of motion) in 27 patients with throwing pain. These patients showed significantly increased true external rotational range and significantly decreased true internal rotational range. The total rotational range of motion was significantly decreased. Retroversion of the humeral head, tightness of the posterior soft tissues, and eccentric contraction of the anterior soft tissues might influence the true rotational range of motion of the shoulder joint.

Arthroscopic excision of bone fragments in a neglected fracture of the lateral process of the talus in a junior soccer player

We reported on an 11-year-old male soccer player who had sustained a fracture of the lateral process of the talus 6 months earlier and then underwent arthroscopic excision of fragments of the talar lateral process. The osseous overgrowth was resected piece by piece, and the loose body was removed en bloc. The patient resumed playing soccer 5 weeks after the operation. This case exemplifies 2 important points: 1) this type of fracture can develop even in children and not only in snowboarders; 2) the arthroscopic excision of fragments of the talar lateral process can be accomplished easily and facilitates an early return to activity.

Bone quality in neurofibromatosis type I

We examined BMD and markers related to bone quality in 17 patients with neurofibromatosis type I. Three patients had osteoporosis, and 4 patients had high serum levels of pentosidine. Although these increased pentosidine levels were not correlated with bone manifestations, further longitudinal investigations of bone metabolism in patients with neurofibromatosis type I are needed.

Publications

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Reviews and Books

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