Concomitant Lateral Meniscus Injury Aggravates Rotational Laxity of the Anterior Cruciate Ligament Injured Knees.

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OBJECTIVES

There are still some cases which have residual rotational laxity after the anterior cruciate ligament (ACL) reconstruction. Not only the ACL but also the secondary restraint against the rotational laxity is suggested to cause this problem, but detection and treatment of the secondary restraint are difficult due to lack of meticulous evaluation systems. Recently several measurement systems for the rotational laxity have been developed to be available for clinical use, such as an electromagnetic system [1], an accelerometer [2], and an iPad app[3].

Several anatomic structures are suggested to be the secondary restraint for the rotational laxity of the knee. Although anterolateral ligamentous structures of the knee has increasingly been focused on, meniscus injury is frequently accompanied with the ACL injury and assumed to have significant impact on the rotational laxity based on previous studies. [4,5]

However, it is still unknown how much the concomitant meniscus injury affects the rotational laxity of the ACL-deficient knees in-vivo. As reported by Musahl et al [6] using the iPad system, our electromagnetic measurement of the pivot-shift test might be used to quantify the effect of the meniscus injury in clinical cases. The purpose of this study was to determine the effect of the meniscus tear on the rotational laxity in the ACL-deficient using the electromagnetic measurement system.

METHODS

Fifty-seven unilateral ACL-injured patients (26 males and 31 females, 24 ± 10 y.o.) were tested. The protocol of this study was approved by the Institutional Review Board in Kobe University, and the informed consent was obtained from all the patients.

The pivot-shift test was performed under general anesthesia during their ACL reconstruction. (Figure 1)

RESULTS

Concomitant meniscus tear was observed in 32 knees. There was a significant difference of clinical grading between the ACL-injured knees with and without meniscus tear (p<0.05).

Also, significant difference was observed for each medial and lateral meniscus torn knee, separately. (p=0.02 and 0.03, medial and lateral, respectively).

Tendency of increased pivot-shift measurements in the meniscus torn knees was demonstrated by the quantitative evaluation, but statistical significance was not achieved (p=0.09).

Subgroup analysis showed that the ACL-deficient knees with lateral meniscus tear had larger tibial acceleration than the meniscus-intact knees (p<0.05), whereas the medial meniscus torn knees did not show aggravated rotational laxity (p=0.33).

CONCLUSIONS

Although the meniscus injury is the most common in addition to the ACL injury, the impact of the meniscus injury on the knee rotational laxity has not been fully examined. Similar to the report by Musahl et al [6], this study demonstrated the significant impact of the meniscus injury, especially lateral meniscus injury, on the rotational laxity in the ACL-deficient knees, which was successfully detected in clinical cases by using the quantitative measurement device.

A careful inspection of the lateral meniscus tear should be required in the ACL-deficient knees with a substantial pivot-shift and, if there is any, it should be repaired as much as possible to avoid additional rotational laxity.

DISCLOSURE

All authors has no conflicts of interest for this study.

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