

# Single- Versus Double-bundle Anterior Cruciate Ligament Reconstruction Using Multi-Stranded Hamstring Tendons

Nobuo Adachi, M.D., Mitsuio Ochi, M.D., Masataka Deie, M.D., Tomoyuki Nakasa, M.D.

*Department of Orthopaedic Surgery, Hiroshima University*

## Introduction

Recent progress in arthroscopic knee surgery and innovation of instruments has enabled us to reconstruct the two bundles separately to mimic the normal structure of the ACL using hamstring tendons.

## Material and Methods

A total of 108 patients with unilateral instability of the anterior cruciate ligament were prospectively randomized for arthroscopic single-bundle or double-bundle anterior cruciate ligament reconstruction using multi-stranded hamstring tendons. Patients were followed up for an average of 32 months (range 24 to 36 months). The same postoperative rehabilitation protocol was used for all patients. We measured the anterior laxity and joint position sense at different flexion angles of the knee to investigate whether the two bundles in the double-bundle anterior cruciate ligament reconstruction provide partial functional responsibility for joint stability and proprioceptive function.

## Result

No significant differences were observed between the two groups regarding the side-to-side differences of anterior laxity measured with the KT-2000 arthrometer with the knee at a 20° and 70° flexed position. The final inaccuracy of the joint position sense at shallow and deeper flexion angles of the knee after surgery was also not significantly different between the groups. Only the incidence of notchplasty was lower in the double-bundle anterior cruciate ligament reconstruction than in the single-bundle reconstruction.

## Conclusion

In conclusion, we could not find a definite advantage of functional partial responsibility in the double-bundle ACL reconstruction over the single-bundle ACL reconstruction in terms of joint stability and proprioceptive function. Therefore, we do not need to persist in performing double-bundle ACL reconstruction at the moment.

**Key word:** Anterior cruciate ligament, Reconstruction, Stability, Proprioception