

Comparison the results between Rectangular Tunnel Technique and conventional round tunnel technique in Revision ACL Reconstruction

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INTRODUCTION: Recent studies have shown that primary ACL reconstruction with a rectangular tunnel can restore the ACL footprint more anatomically, and produce better clinical outcomes than those achieved via a conventional round tunnel, but lack of studies in ACL revision surgeries. The purpose of this study is to compare the clinical outcomes of ACL revision surgery between rectangular tunnel and conventional round tunnel technique.

METHODS: This study included the one-stage revision ACL reconstructions using the rectangular tunnel technique and conventional round tunnel technique from 2011 to 2021. The exclusion criteria were combined fractures, osteotomy, more than 15mm of tunnel widening and multiligament injuries other than MCL injury. Intraoperative findings and postoperative knee laxity and clinical outcomes were assessed after minimum 2 years follow up. Cause of failure after primary ACL reconstruction was collected. Failure was defined as symptomatic rotatory knee laxity with a positive pivot shift test graded as 2 or 3, or anterior knee laxity with a positive lachman test graded as 2 or 3 or more than 5mm anterior translation on stress radiography.

RESULTS:

Thirty eight patients were included after ACL revision surgery using rectangular tunnel technique (group 1) (Figure 1) and 96 patients using conventional round tunnel technique (group 2). Causes of failure after primary ACL reconstruction were acute trauma in 58 knees, femoral tunnel malposition in 12 knees, and objective clinical failures in pivot shift or lachman test, as well as stress radiograph in 64 knees, and no difference between groups. The IKDC subjective scores were significantly improved from 42.6 ± 8.3 to 84.3 ± 7.1 in group 1, and 44.1 ± 10.3 to 82.8 ± 7.1 in group 2, but no difference between groups. ($p > 0.05$) The Tegner scores were improved from 2.7 ± 1.6 to 5.2 ± 1.5 in group 1, and 2.5 ± 1.7 to 4.9 ± 1.8 in group 2, but no difference between groups. ($p > 0.05$) The positive pivot shift on postoperative follow up period was 5/38 (13.2%) in group 1, and 20/96 (20.8%) in group 2, but no different in both groups ($p = 0.46$). There were no differences of amount of anterior translation between groups at preoperative and postoperative neither. ($p > 0.05$) There were no complications after surgery, as well as femoral condyle blow out. There were two patients who was converted to secondary ACL revision during conventional round tunnel surgery, but no patients during rectangular, although these patients were excluded in analysis.

DISCUSSION AND CONCLUSION:

Revision ACL reconstruction with a rectangular tunnel could be considered as a reliable, safe technique with comparable results of conventional round tunnel ACL revision surgeries.

