

ABSTRACT

Purpose of the study: The aim of the study is to present a comparison of two years result of double-bundle versus single-bundle anatomical reconstruction of the anterior cruciate ligament using hamstring tendons and their fixation with bioabsorbable interference screws.

Material and methods: A total of 110 patients with an isolated anterior cruciate ligament rupture and the healthy contralateral knee who met the indication criteria for double-bundle anterior cruciate ligament reconstruction were intra-operatively allocated at random to either double-bundle group (DB, n=55) or single-bundle group (SB, n=55). At two years after surgery, 82 patients (DB group, n=43; SB group, n=39), comprising 66 men and 16 women, were evaluated; the average age was 29 years and the injury-to-surgery interval was 81 days. Pre-operative and post-operative subjective criteria involved the subjective IKDC and Lysholm score were evaluated. Objectively, the occurrence of graft failure, range of motion deficit, return to pre-injury sports activity, side-to-side difference in anterior laxity of both knees in 20° flexion on a GNRB laximeter at an applied pressure of 124 N and 250 N, and pivot shift phenomenon were assessed.

Results: No statistically significant difference was found in pre-operative values between the two groups. Post-operatively, there were no significant differences in the occurrence of complete graft failure ($p=0.26$; DB group, n=1; SB group, n=3), range of motion deficit ($p=0.23-0.98$) or return to pre-operative sports activity ($p=0.23$). In the DB group, side-to-side anterior tibial laxity at a pressure of 124 N (medians=1.2 mm and 2.3 mm for DB and SB groups, respectively; $p<0.0001$) and at a pressure of 250 N (DB group=2.0 mm; SB group = 4.0 mm; $p<0.0001$) were significantly different from the corresponding values in the SB group. Positive results for the pivot shift test were significantly less frequent in the DB group than the SB group (Chi-square test=0.0009). The SB group patients had a 4.7-times (odds ratio=4.7) higher risk of positive postoperative pivot shift test results than the DB group patients. In both groups, a comparison in time of pre- and post-operative criteria showed significant improvement in both the subjective and the objective results.

Conclusions: The results of our study showed significantly better restoration of knee rotational and anterior laxity in the patients undergoing anatomical reconstruction of the anterior cruciate ligament by the double-bundle technique. The other evaluated criteria did not differ in relation to the technique used.

Key words: anatomical reconstruction, anterior cruciate ligament, double-bundle technique, single-bundle technique, anterior laxity, rotational laxity, knee, pivot shift test.