

ACL Revision Surgery with Autografts and Allografts: A Comparative Study

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Introduction

Anterior cruciate ligament (ACL) reconstruction is one of the most common surgical procedures in orthopedics [1], and the number of ACL revision surgeries is increasing concomitantly [2]. ACL revision surgery is more technically demanding and final results are less satisfactory than primary surgeries [2]. In the ACL revision surgery both autografts or allograft can be used [3]. The choice is related to the surgeon's experience and donor site morbidity. The autografts more commonly used are bone-patellar tendon-bone (BPTB) or hamstrings. Considering the primary ACL reconstruction, they have shown satisfactory strength and incorporation [4], and better results compared to the allograft, but there is insufficient data about the results of revision ACL surgery with the use of allografts. However, in ACL revision cases, donor site morbidity may be a problem, mainly in second or third revisions. The purpose of this study is to evaluate the results of ACL surgery comparing the results of cases in which autografts or allografts have been used.

Methods

Patients submitted to ACL revision surgery were retrospectively evaluated. All patients had the diagnosis of ACL reconstruction failure confirmed by clinical examination and MRI assessment. The protocol was approved by the institutional IRB. The autografts were frozen, non-irradiated, following the standards of the American Association of Tissue Banks. The final outcome was the presence or absence of the pivot-shift test. We compared the results using the Fisher exact test.

Results

Fourteen patients were included, with average follow-up of 19.7 months. Nine patients were male (six in the autograft group and three in the allograft group). Autografts were used in eight cases and allografts were used in six cases. Average age was 24.8 years old (19.3y.o. in the autografts group and 29y.o. in the allograft group). Considering the six cases in which allograft have been used, BPTB allograft was used in five cases and anterior tibialis in one case. Considering the eight cases in which autografts have been used, BPTB autografts were used in five cases and hamstrings in

three cases. Pivot-shift test was positive in one case and absent in seven cases of autografts group. Pivot-shift test was present in five cases and absent in one case of allograft group (Fisher exact test, $p = .026$).

Discussion

Allografts are more commonly used in ACL revision surgeries than in the primary surgery [5]. Potential advantages are no donor site morbidity, less pain, and faster recovery. However, there is a concern regarding their healing potential and mechanical properties. A meta-analysis has shown a 3 fold rate of failure in primary ACL cases with allografts compared to autografts [6,7]. Gorchewsky et al observed a failure rate in six years of 5.9% with autografts and 44.7% with allograft [8], and Singhal reported a reoperation rate of 38% in patients with less than 25 years old with the use of allograft [9]. The results of revision ACL tend to be poorer than the results of primary ACL surgeries, with failure rates up to 24% [10]. Pivot-shift test is considered the most specific to ACL insufficiency diagnosis [11-13]. Pivot-shift test results are related to patient's satisfaction, symptoms and sports participation [14,15]. It is more associated with clinical results than the Lachman test [15-17]. The correlation between pivot-shift and functional scores has been reported as 85% [14].

The pivot-shift is a subjective test, and, although it has been divided accordingly to its severity, the classification in present or absent is more reproducible and trustworthy [11,13,16]. In this study, we observed a positive pivot-shift in the majority of patients operated with allograft and in only one case operated with autografts. All surgeries were performed by the same surgeons; therefore, the possibility of differences in technical errors is low, and much of the results can be attributed to the graft used. The average age of patients in the allograft group was 19 years old. Therefore, in the young, active patient, autografts would be a better choice for ACL revision surgery.

Conclusion

Post-operative results of ACL revision surgery with autografts were better in terms of knee stability than the results with



allograft. In the active, young patient, allograft showed a high rate of persistent instability. The use of autografts showed to be a better option in these cases.

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