Introduction

Revision anterior cruciate ligament reconstruction (ACLR) is becoming increasingly common as the number of primary ACLR cases continues to rise.

- Risk factors for primary ACLR failure broadly include incorrect tunnel placement, secondary trauma, undiagnosed concomitant knee pathology, failed graft healing, arthrofibrosis, and graft size or type.

Indications:

- Single-stage revision ACLR:
  - Initial femoral and tibial tunnels are correctly positioned
  - Have not undergone tunnel widening or osteolysis
  - Will not converge with the placement of the proposed new tunnels.

- Two-Stage revision ACLR:
  - Cases where previous malpositioned reconstruction tunnels cannot be bypassed
  - There is significant reconstruction tunnel widening (≥14 mm)

To date, revision ACL surgery literature has largely focused on comparing revision ACLR to primary ACLR outcomes.

Paucity of studies looking specifically at revision ACLR cohorts which compare the outcomes of single-stage versus two-stage revision surgeries.

Purpose: To compare the outcomes, patient satisfaction, and failure rates of single-stage versus two-stage revision ACLRs.

Hypothesis: there was no difference in failure rate between single-stage and two-stage ACL revision surgeries.

Study Design

Patients were included in this study if:

- At least 17 years of age
- Closed phases
- Single stage or two stage revision ACLR performed by a single surgeon
- Minimum 2-year follow-up

All patients with a failed ACLR underwent a detailed history, clinical exam and radiographic workup to determine the etiology of the ACL graft failure.

Patients were excluded from this study if:

- Skeletally immature
- Had a previous intraarticular infection or intra-articular fracture in the ipsilateral knee, or underwent a prior alignment correction procedure, cartilage repair or transplant procedure, or meniscal allograft transplantation.

Each patient obtained and had tunnel diameter measurements on MRI and CT scans.

If the reconstruction tunnel diameter was equal or larger than 14 mm, or there was overlap with a malpositioned previous tunnel, the patient was indicated for a two-stage revision procedure.

Methods

Objective outcomes and subjective scores and satisfaction were not significantly different between one-stage and two-stage ACLR revision surgeries.

We observed four failures in the one-stage procedure group (10.3%) and Three failures in the staged reconstruction group (6.1%).

- The difference in failure rate between the two groups was not significant (p=0.48).

Both procedures resulted in significantly improved outcomes without notable differences in failure rates.

Further longitudinal studies comparing single-stage and two-stage revision ACLR procedures over a longer time frame are recommended.

Results

Conclusions: In this study, objective outcomes and subjective patient scores and satisfaction were not significantly different between one-stage and two-stage ACL revision surgeries. Both procedures resulted in significantly improved outcomes and patient subjective outcomes without notable differences in ACLR failure rates.