

of this study was to assess the demographics, technique, and results of ACL revision in children and adolescents.

Methods: This was a retrospective case series and outcomes assessment of all pediatric/adolescent patients (<18 years) who underwent revision ACL surgery at a single institution. Charts were reviewed for patient demographics, injury characteristics, operative details, surgical complications, and patient outcome. Patient-oriented outcome measures were also sent to all patients and included the Pedi-IKDC, Tegner Activity Scale, Lysholm Knee Score, and a self-designed Physical Activity Survey to assess return to sport.

Results: Ninety revision ACL reconstructions were performed in 88 patients. Average patient age at the time of revision was 16.6 years (SD 1.69), and 28.8% were skeletally immature. Time to failure after primary ACL reconstruction was 1.28 years (SD 1.06), and the most common mechanism of failure was noncontact sports injuries. 74.4% had additional intraarticular injuries that required surgical intervention at the time of revision. Revision graft type included allograft (61.1%), patellar tendon (21.1%), hamstring (16.7%), and iliotibial band (1.1%). There was a 20% graft reinjury rate. Additional procedures after revision were required in 25.5% of knees, and 20% of revision reconstructions had contralateral ACL injuries. 50% of patients completed outcome measures with an average time since revision of 5.1 years. The mean outcome scores were: Pedi-IKDC 71.7 (SD 12.6), Lysholm 79 (SD 13.2), Tegner 6.6 (range 6-10). 69% of patients reported returning to sports at an average of 8.9 months (3-36), however, only 55.2% of these reported being able to return to the same level of play.

Conclusion: Revision ACL reconstruction in pediatric patients was associated with worse functional outcome, lower activity level, higher rates of graft re-tearing, and lower return to sports rates than primary ACL reconstruction.

Biomarker Changes in ACL Deficient Knees Compared with Contralaterals

SS-11

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Introduction: Though ACLR outcomes are overwhelmingly positive, patients' recovery processes are highly variable, and typically based off generalized time-tables derived from population data. In an attempt to individualize prognostic estimates, we sampled knee joint synovial enzyme concentrations in patients with ACL tears with, and without cartilage injury, and compared them with the contralateral non-injured knee.

Methods: 480 patients indicated for knee arthroscopy had samples drawn to form a database. If no pathological history existed in the contralateral knee, samples were drawn as well. For this study, only patients that had confirmed ACL injury on arthroscopy were included.

Samples were drawn 3-12 weeks after initial injury. Associated cartilage injury was noted. Samples were centrifuged, and concentrations were determined using an Elissa test. Concentrations were then compared between the three study groups (ACL tear with cartilage injury (without cartilage injury, and contralateral) using a Welch ANOVA test with pairwise comparisons.

Results: The study included samples from 132 knees which included: 34 ACL tears without cartilage damage (mean age 34.00 years); 28 ACL tears with cartilage damage (36.29 years), and 72 contralaterals (41.06 years). ANOVA testing demonstrated significant differences among groups for: MMP-3 ($p > .001$); TIMP-1 ($p = .001$); TIMP-2 ($p = .015$); FGF-2 ($p = .011$); IL-6 ($p = .001$); and MIP-1b ($p = .001$). Pairwise comparisons demonstrated no significant differences between ACL tears with, and without cartilage damage, but did show both types of ACL tears had significantly higher concentrations of MMP-3, TIMP-1, IL-6, and MIP-1b than contralaterals. ACL tears without cartilage damage had significantly lower concentrations of TIMP-2 and FGF-2 (13).

Conclusion: The course from repair to symptomatic relief is highly variable. Cytokine concentrations are shown here to be significantly different between ACL tears (+/- cartilage damage) and healthy knees. These validated differences can help establish these biomarkers as a method for injury stratification ultimately providing patient-specific prognostic data.

Transphyseal ACL Reconstruction in Skeletally Immature Patients: Does Independent Femoral Tunnel Drilling Place the Physis at Greater Risk Compared to Transtibial Drilling?

SS-12

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Introduction: The purpose of this study was to radiographically assess differences in physeal disruption between transtibial and independent tunnel drilling techniques following ACL reconstruction in skeletally immature patients.

Methods: A retrospective, matched comparative cohort study was performed of skeletally immature patients who underwent transphyseal ACL reconstruction between January 1, 2008 and March 31, 2011. All skeletally immature patients between 10 and 15 years old who underwent independent femoral tunnel drilling and had adequate baseline and post-operative radiographs were analyzed. These patients were matched with a transtibial technique cohort based on age and sex. Demographic characteristics and peri-operative metrics were collected. Radiographic measurements were recorded from pre-operative MRI and post-operative plain radiographs.

Results: Twenty patients were analyzed. Between groups, there were significant differences in the