

native ACL footprint while avoiding potential anteromedial portal complications.

Methods: Thirty-nine patients (24males, 15females; age 38.4 ± 9.9 years) that underwent single-bundle, TT ACLR by a single surgeon (1999-2015) were included. Radiographic evaluation ≥ 12 months following ACLR included radiographs, MRI, and CT scan. CT scan underwent 3D reconstruction to 0.625mm using the OsiriX program (Pixmeo, Geneva, Switzerland). The ratio of the posteroanterior and proximal-distal position for femoral footprints and medial-lateral and anteroposterior position for tibial tunnels were compared to normative cadaveric values using independent samples t-test ($p < 0.05$, corrected for multiple comparisons).

Results: Average femoral posteroanterior footprint position ($28.6 \pm 4.4\%$) was not statistically different from normative AM bundle footprint ($p = 0.0547$) but was from normative PL bundle footprint ($p = 0.0001$). Average femoral proximal-distal position ($39.8 \pm 9.0\%$) was statistically different from normative AM and PL bundle footprints ($p = 0.0044$, $p = 0.0001$). Average tibial medial-lateral footprint position ($47.3 \pm 2.0\%$) was not statistically different from normative AM or PL bundle footprints ($p = 0.4215$ and $p = 0.0909$). Average tibial proximal-distal position ($47.9 \pm 6.0\%$) was statistically different from normative AM bundle footprint ($p = 0.0001$) but not from normative PL bundle footprint ($p = 0.2041$).

Conclusion: The TT, single-bundle technique for ACLR yields a combined AM/PL bundle restoring anteroposterior and rotatory stability of the knee following ACL injury. These results suggest that the femoral footprint is similar to cadaveric values derived for the AM bundle on the femoral side and the PL bundle on the tibial side. This simple, easy to use program can aid all physicians in determining whether their anteromedial portal or TT technique successfully restores the anatomic ACL footprint.

The Relationship of Anterior Cruciate Ligament Insertion Sites to the Distal Femoral Growth Centers: an MRI study

SS-13

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Introduction: Anterior cruciate ligament (ACL) injury and reconstruction have become increasingly common in the pediatric and adolescent populations. The ACL is close to the distal femoral physis and posterior epiphysis, a growth center for the distal femur. We sought to explore the changes in the anatomic relationship of the two bundles of the ACL in order to provide guidelines for surgical reconstruction.

Methods: We reviewed knee MRIs in patients ages 6-18 (IRB approved), excluding patients with cruciate injury. Standardized measurements of anterior-medial (AM) and posterior-lateral (PL) bundle area, distance from physis

and posterior epiphysis to edge and center of each bundle were evaluated for each MRI.

Results: 154 studies were included. The footprints of each bundle increase predictably with age. The PL bundle footprint is larger than the AM bundle in both genders (16.2 ± 5.3 vs. 12.0 ± 4.1 mm², $p < 0.001$). The average distance across all groups from the center and edge of the AM bundle to the physis was 8.2 ± 1.9 mm and 7.0 ± 1.8 mm respectively (figure). The average distance of the PL bundle center and edge to the posterior epiphysis was 5.6 ± 1.9 mm and 4.4 ± 1.8 mm respectively. Patients had an increase in the average distance from the AM bundle to the physis with age, which was < 10 mm in skeletally immature patients. Males had consistent increase in distance of the PL bundle to the physis. Minimum distance increased gradually with age.

Conclusion: We demonstrated increase in area of each bundle footprint with age, with the PL bundle footprint being larger. We found that the AM bundle inserted < 10 mm from the distal femoral physis in patients under age 15, closer than previously recognized, while the PL bundle is adjacent to the posterior epiphysis. This should provide better guidelines for surgical reconstruction in the pediatric patient to avoid growth disturbance.

Thirty-year Experience with ACL reconstruction using Patellar Tendon: A Critical Evaluation of Revision and Reoperation

SS-14

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Introduction: To describe and analyze a single surgeon's experience with primary and revision single-bundle ACLR over a 30-year focusing on incidence and risk factors for revision and reoperation.

Methods: Patients who underwent ACLR from 1986 to 2016 were identified from a prospectively maintained database. Covariates of interest included age, sex, time, and graft selection. Outcomes of particular interests included reoperation rates after primary/revision ACLR, and rate of revision ACLR.

Results: A total of 2450 ACL reconstructions (mean age, 29 years; 58% male) were reviewed. Among primary ACL reconstructions performed ($n = 2225$), 68% had BTB autograft and 30% had a BTB allograft. Patients undergoing autograft and allograft ACLR had an average age of 22 and 37 years, respectively ($P < .05$). The rate of personal ACLR revision was 1.8% ($n = 40$) for primary cases and 3.5% ($n = 7$) for revision cases. There was a higher revision rate among female (2.6%) than male patients (1.2%), particularly in patients under 20 years of age. There was a higher revision rate among primary allograft (2.7%) than autograft (1.3%) reconstruction, with a greater difference in patients under 30. Low dose irradiation for sterilization did not affect allograft revision



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