without evidence of increased re-rupture rate or any signs of infection. Modified harvest and closure techniques reduce anterior knee pain after autograft BPTB.

Two Year Follow-up Comparing 2-Incision vs Anteromedial Portal Techniques for Femoral Drilling During Primary ACL Reconstruction
SS-15

April 14, 11:55 AM

Tyler Carllee, M.D., Presenting Author
Zachary Ries, M.D.
Brian Wolf, M.D.
Annunziato Amendola, M.D.
Carolyn Hettrich, M.D.
Matthew Bollier, M.D.

Introduction: Anteromedial (AM) and 2-incision are two commonly used techniques for drilling the femoral tunnel during ACL reconstruction. The purpose of this study was to compare clinical and radiographic outcomes of patients undergoing primary ACL reconstruction using either AM or 2-incision technique with minimum 2-year follow-up.
Methods: 138 prospectively enrolled patients undergoing primary ACL reconstruction were divided into two groups based on femoral drilling technique and were evaluated pre-operatively, 6 weeks and 2 years post-operatively. Outcomes scores were collected at each visit using SF-36 PCS and MCS components, KOOS, and the Knee Activity Rating Scale.
Results: 48 patients underwent AM technique and 90 patients underwent 2-incision. Univariate analysis revealed no difference in pre-operative outcomes with the exception of AM group having higher KOOS Knee Pain ($p=0.023$) and Womac Pain ($p=0.036$). Following surgery, 2-incision femoral tunnels had a higher radiographic coronal angle ($68.8°\pm8.6°$ vs $51.4°\pm11.3°$; $p<0.001$) and clinical extension ($1.2°\pm2.7$ vs $2.9°\pm4.0°$; $p=0.010$). There were no differences in knee flexion, complications, or re-rupture. There were also no differences clinical outcome scores with the exception of AM group having a higher 6-week and 2-year post-op KOOS ADL ($p=0.030$ and 0.050, respectively) and KOOS Womac ($p=0.030$ and 0.050, respectively), although likely not clinically relevant given the pre-operative differences. Multivariate analysis showed no clinical or outcome differences between AM and 2-incision techniques.
Conclusion: ACL reconstruction using the AM technique yielded lower radiographic coronal tunnel angle and slightly decreased knee extension. The theoretical risk of graft failure secondary to higher coronal angle leading to a "sawing" of the graft as it passes around a sharper femoral corner was not observed. Additionally, differences in pre-operative KOOS likely made post-operative differences irrelevant. We conclude there are no clinically relevant differences at 2 years in patients undergoing primary ACL reconstruction using either the AM or 2-incision femoral drilling techniques.

Fibrin Clot Prevents Bone Tunnel Widening after ACL Reconstruction with Allograft
SS-16

April 14, 1:45 PM

Carola van Eck, M.D., Ph.D., Presenting Author
Levent Surer, M.D.
Can Yapici, M.D.
Claudia Guglielmino, M.D.
James Irrgang, P.T., Ph.D., A.T.C., F.A.P.T.A.
Freddie Fu, M.D, D.Sc

Introduction: Bone tunnel widening is a potential complication after ACL reconstruction. The aim of this study was to evaluate if adding a fibrin clot to the allograft for anatomic single-bundle ACL reconstruction would reduce tunnel widening.
Methods: Fifty patients who underwent anatomic single-bundle ACL reconstruction were included. Twenty-five patients received an allograft alone and 25 patients received an allograft with fibrin clot. All patients underwent standard plain anterior-posterior and lateral radiographs of the operated knee immediately after surgery and at 1 year follow-up. The size of the tunnels was measured at both time points to calculate tunnel widening. A t-test was used to compare tunnel widening between the allograft and the allograft + fibrin clot group.
Results: There was significantly less tunnel widening in the allograft + fibrin clot group for the femoral tunnel width in the middle and distal portion of the tunnel and for the tibial tunnel width in the proximal and distal portions, as compared to the allograft only group.
Conclusion: Adding a fibrin clot to the allograft in anatomic single-bundle ACL reconstruction reduces the amount of tunnel widening at one year follow-up.

Increased Lateral Tibial Plateau Slope Predisposes Male College Football Players to ACL Injury
SS-17

April 14, 1:50 PM

Carola van Eck, M.D., Ph.D., Presenting Author
Amir Azar, M.D.
Zaneb Yaseen, M.D.
James Irrgang, P.T., Ph.D., A.T.C., F.A.P.T.A.
Freddie Fu, M.D, D.Sc
Volker Musahl, M.D.

Introduction: There are conflicting reports regarding the role of bony morphology characteristics such as an increased tibial slope as a risk factor of anterior cruciate ligament (ACL) injury. The purpose of this study was to determine if there is a correlation between bony morphology characteristics and ACL injury risk in male college football players.
Methods: Ninety male college football players who underwent magnetic resonance imaging (MRI) for a knee injury between 2005 and 2014 were included. Subjects with an ACL injury (ACL injury group) were matched for age, height, weight and BMI to subjects without ACL

injury (control group). Several bony morphology characteristics including medial and lateral condyle width, medial and lateral plateau width, notch width, bicondylar width, notch width index, and medial and lateral tibial slope were measured and compared between groups. Conditional logistic regression was used to analyse the data. Significance level was set at $p<0.05$.

Results: According to univariate analysis, a narrower lateral femoral condyle (OR, 0.82; CI, 0.68-0.97), increased medial tibial plateau slope (OR, 0.1.42; CI, 1.85) and increased lateral tibial plateau slope (OR, 1.43; CI, 1.15-1.78) were associated with an increased risk for ACL injury. Multivariate analysis revealed that increased lateral tibial slope (OR, 1.32; CI, 1.03-1.70) was the sole independent risk of ACL injury.

Conclusion: A narrower lateral femoral condyle width and an increased medial and lateral tibial slope predispose male college football players to ACL injury. It is suggested to enroll these high-risk subjects in prevention programs to reduce the incidence of injury.

Septic Arthritis After ACL Reconstruction: Does Graft Retention Portend Increased Risk of Surgical Revision?

SS-18

April 14, 1:55 PM

William Arroyo, M.D., Presenting Author
Brian Waterman, M.D.

Introduction: The purpose of this study was to evaluate the clinical and functional outcomes of patients with septic arthritis after ACL reconstruction with and without graft retention.

Methods: A retrospective query of the Military Health System Management and Reporting Tool was performed to identify all patients undergoing primary arthroscopic ACL reconstruction with subsequent development of septic arthritis between 2007-2013. Clinical course, objective physical exam findings, and patient-reported outcomes were recorded. Graft choice, time to treatment, bacterial culture and specificity, number of arthroscopic debridements, and graft retention were evaluated as potential risk factors. Primary outcomes of interest included persistent ACL laxity (i.e. Lachman test of 2+ or greater or positive pivot shift), revision ACL reconstruction, and inability to return to military function.

Results: 31 patients were isolated at a mean follow-up of 24-months. Graft choice included hamstring autograft(55%;n=17), hamstring allograft(32%;n=10), and autologous bone-patellar tendon-bone (13%;n=4). A total of 8 patients(26%) developed an acute infection (<2 weeks), 17 patients(55%) had subacute infection(2-6 weeks) and 6 patients(19%) had chronic infection(>6 weeks). The most frequently isolated bacteria were MRSA(35%;n=11), MSSA(n=2;6.5%) and MRSE (n=2; 6.5%), whereas 15 cases(48%) had no known isolate. All patients were treated with arthroscopic debridement(average 2.3;range,1-4) and intravenous antibiotics, and the graft was retained in 64%(n=20). Of this group with graft retention, 6 patients developed significant knee laxity (30%) and 2 of these underwent revision(10%). Two patients each with subacute and chronic infections developed early post-infectious arthritis, as compared to no patients with acute infections. In this study 48%(n=15) were able to return to military function, and there was no statistically significant difference according to graft retention.

Conclusion: Arthroscopic irrigation and debridement with graft retention is an effective treatment for patients with septic arthritis after primary ACL reconstruction. Factors affecting clinical outcomes may include late presentation and residual graft laxity after arthroscopic irrigation and debridement.

Investigating the Precision and Accuracy of Subjective Patient and Surgeon Expectations following Anterior Cruciate Ligament Reconstruction

SS-19

April 14, 2:00 PM

Fotios Tjoumakaris, M.D., Presenting Author
Nicholas Lombardi, B.S.
Kevin Freedman, M.D., M.S.C.E.
John Salvo, M.D.
Michael Ciccotti, M.D.
Steven Cohen, M.D.
Bradford Tucker, M.D.
Matthew Pepe, M.D.

Introduction: Advances in orthopaedic surgery have redefined patients' perception of the successful outcome. Recent literature suggests that patient satisfaction following orthopaedic surgery is related to their outcome and their preoperative expectation. However, patients undergoing ACLR may have unrealistic expectations which may contribute to worse outcomes and reduced patient satisfaction. The purpose was to compare patient's expectations and surgeon's expectation using validated outcome assessment tools as expectation questionnaires. Actual patient outcomes were tracked to determine accuracy of the expectations.

Methods: All patients undergoing primary ACLR for ACL tear were eligible. Patients completed IKDC and Lysholm knee questionnaires pre-operatively and at 3 and 6 months postoperatively. Before surgery patients completed a second set of IKDC and Lysholm knee questionnaires pertaining to how they expect their knee to feel in 18 months. Immediately post-operatively, surgeons completed a set of IKDC and Lysholm questionnaires representing how they expected the patient to fare in 18 months.

Results: 76 consecutive patients were enrolled. Preoperatively, patient average Lysholm and IKDC scores were, 55.27 and 45.0%. Analysis of Lysholm score revealed patient's reported expectations significantly higher (mean = 94.9) than surgeons (mean= 92.6) (p= <.001). The average difference between patient and surgeon expectations was 10.9 points. Analysis of IKDC scores revealed the same trend; patient (92.3%) vs. surgeon (91.8%) expectations. 58/76 patients reached 6