Medial Patellofemoral Ligament Reconstruction in the Skeletally Immature Population using an Anatomic Physeal Sparring Technique (SS-23)
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Introduction: The purpose of this study is to evaluate the success rate and clinical outcomes of a medial patellofemoral ligament (MPFL) reconstruction in a skeletally immature population using an anatomic physeal sparring technique.
Methods: Between 2005 and 2011, forty-four skeletally immature consecutive knees with recurrent patellar instability (greater than 3 dislocations) underwent a primary MPFL reconstruction using either a gracilis or semitendinosus autograft. The surgical technique used in subjects with open physis requires the femoral origin of the MPFL reconstruction to be distal to the physis. This position was determined intraoperative by fluoroscopy. Presentation and radiographic data were retrospectively reviewed, while outcome measures, including the Kujala and Tegner activity scale, were prospectively collected. Thirty-five subjects with a minimum of one year were available for follow up.
Results: Between 2005 and 2011, the mean age of skeletally immature patient who underwent a MPFL reconstruction was 12.6 years (range: 7 - 15 years old). At a minimum of two years, the mean Kujala score was 93.2 and median Tegner scale of 6 in subjects who were not considered failures. Four subjects (11%) had recurrent patella dislocation or required revision stabilization procedures. No participants had evidence of physeal injury or arrest following the procedure. Between those who failed to those who did not fail, there was a trend for patellar alta (Insall-Salvati index 1.58 vs. 1.48) and trochlear dysplasia (lateral to medial facet ratio 2.34 vs. 2.2), in those who failed, however, these were not statistically significant differences (p value 0.29 and 0.30; respectively). A significantly higher tibial tubercle to trochlear groove distance was seen in subjects who failed their primary MPFL reconstruction (23.28 mm versus 16.65 mm; p value 0.02).
Conclusion: An MFPL reconstruction in the skeletally immature patient with recurrent patellar instability is a safe procedure when using a femoral origin distal to the physis with good short-term success and a low failure rate.

Effect of the Diameter of the Suture Passer on the Resistance of the Rotator Cuff Repair (SS-24)
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Introduction: To determine the effect of the diameter of the suture passer on the resistance to axial traction on a simulated repaired lamb infraspinatus tendon. Hypothesis: The diameter of the suture passer is inversely related to the resistance of the rotator cuff repair.
Methods: 36 ex-vivo lamb infraspinatus tendons were divided into three groups. Each group was repaired with an equally morphological suture passer but with different diameters: Group 1: 1 mm passer. Group 2: 2 mm passer. Group 3: 3 mm passer. Continuous, progressive axial traction was applied in all the samples until point of maximum failure of the repair. Resistance was measured by using a PASCO® transducer and recorded in a computer. Statistical analysis was performed with the Kruskall-Wallis and Mann-Whitney U tests (Power: 90%, Error: 0.05).
Results: Mean resistance per group: Group 1: 276.4N (SD: 71.5N). Group 2: 257.5N (SD: 65.2N). Group 3: 207.3N (SD: 43N). There was a significant difference between groups 1 and 3 but not between groups 1 and 2 ($p \leq 0.05$).
Conclusion: The suture passer diameter has an inverse effect on the resistance of the repaired tendon, achieving a significant difference between 1 and 3 mm of diameter. The use of a smaller diameter passer could favor a stronger repair in-vivo.

Functional Limitations as Measured by the ASES Score for Patients that Present With Rotator Cuff Pathology (SS-25)
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Introduction: Rotator cuff tears are known to cause pain, weakness and decreased range of motion limiting functional ADLSs and overhead work. Despite the American Shoulder and Elbow Surgeons (ASES) score's routine use in shoulder research, few studies have looked at the ASES in a disease-specific manner and assessed its sensitivity to detect sub-types of rotator cuff disease. The purpose of this study was to determine if specific tendon tears identified at the time of primary rotator cuff repair surgery were associated with preoperative functional limitations and pain as measured by ASES scores.
Methods: This study was IRB approved. All patients that had primary rotator cuff surgery and preoperative ASES scores were eligible and were screened from our clinical database. We excluded all patients under the age of 18, those who had prior surgery, those that had concomitant treatments for instability, and those with incomplete preoperative ASES scores. Data collected included demographics, surgical pathologies and subjective scoring scales, SANE & SF-12 Physical(PCS) & Mental(MCS) components. The ASES score is a 100 point score with 50 points coming from the pain and 50 points coming from 10 functional questions. The total ASES score along with the ASES-Pain component and the ASES-Function component were analyzed separately. For statistical analysis level of significance was set at $p<0.05$.
Results: 470 patients were included in this study. The mean age at surgery was 56 years (range 20-79) with 150 females and 320 males. Mean time between obtaining preoperative ASES scores and undergoing surgery was 38 days (range 1-177). For the entire cohort the mean

preoperative ASES score was 58(SD+18.8). There was a significant correlation in the ASES score with the SANE (rho= 0.474; p<.001), SF-12 PCS (rho= 0.385; p<.001) & SF-12 MCS (rho= 0.27; p <.001) scores (p<.001) but not with age at surgery. Preoperatively, women had lower ASES scores than men (55 vs 61) (p=.003). The 184 patients with partial thickness tears had higher ASES-Functional component scores(29 vs 26) than the 229 patients with full thickness tears (p=.011). Irreparable cuff tears had lower ASES-Function component scores (18 vs 28) when compared to those that had repairable tears (p=.007). Patients with posterosuperior (supra & infraspinatus) tears had higher ASES-Function component scores (28 vs 24) when compared with those with partial tears or tendonopathy (p=.003) . Patients that had adhesions had lower ASES-Function component scores of 19 vs 27 (p=.001).

Conclusion: This study shows that most surgical factors analyzed had significant correlations with the ASES-Functional component but not with the ASES-Pain component of the ASES score. Individual tendon tears were not significantly associated with the total ASES score or ASES-Pain component but many cuff tendon variables were significantly associated with the ASES-Functional component. We also found that women who presented with rotator cuff pathology had lower function. These results will help surgeons understand differing disabilities in patients who present with rotator cuff disorders.

The Radiologic Results of Ultrasonography-Assisted One-time Needling in Calcific Tendinitis Patients (SS-26)

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Introduction: The purpose of this study was two-fold, first to report the early radiologic result of the calcific material after one-time ultrasonography-assisted (US-A) needling in calcific tendinitis patients and second, to identify the demographic and radiologic factors that induce radiographic disappearance by this one-time needling.

Methods: For a 3-year period, 126 consecutive patients (137 shoulders) with symptomatic calcific tendinitis were treated by one-time US-A needling. Diagnostic US was first performed to rule out any other shoulder pathologies. After localizing the calcific material, 18-gauge needle was introduced for needling procedure including aspiration and multiple puncture. Afterwards all patients received subacromial corticosteroid injection. Patients were followed up at 4 weeks after the procedure. Radiologic assessments were compared to pre-needling radiographs on size, density, and morphology of the calcific deposits (by French Arthroscopic Society classification). The demographic data and radiographic features were compared between change in calcification group (including complete disappearance) versus no-change group.

Results: There were 33 male and 104 female patients with the mean age of 54.6 years. The morphology of the calcific deposits were 91 type A and 46 type B and mean size was 14.0±6.24 mm before the procedure. At 4 weeks after the index procedure, the radiologic unchanged group was 32 and changed group was 105 cases (31 reduction of size, 47 lower density, 21 scant remainder, and 6 complete disappearance). Between two groups no difference was seen for the demographic data and size before the procedure. However, group FAS classification two groups before the procedure was significantly different (p<0.001): while the radiologic change group had 59 type A and 46 type B, all of the unchanged group had type A.

Conclusion: Only with one-time needling, radiologic changes in size and/or density were seen in 76.6% of the calcific tendinitis patients at 4 weeks after the index procedure. However, complete or nearly complete disappearance of the calcification was seen in only 19.7%. The FAS classification before the procedure was the only factor correlated with radiographic disappearance after one-time US assisted needling.

The Effect of Immobilization without Passive Exercise after Rotator Cuff Repair (SS-27)

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Introduction: While animal studies showed better healing in longer duration of immobilization without passive motion after rotator cuff (RC) repair, there were rare clinical studies to support. The purpose of this study was to see clinical results of immobilization in rotator cuff repair and to see if there was any difference between duration of immobilization.

Methods: One-hundred patients who underwent arthroscopic single-row repair for medium-to-large RC tear were prospectively randomized to 4 or 8 weeks of immobilization. During the immobilization period after the surgery, any passive or active range-of-motion exercise including pendulum exercise was not allowed. According to the Intention-to-treat protocol and full analysis set, a total of 88 patients were evaluated after exclusion of 12 patients who did not have any clinical visit after 6 months postoperatively. Range-of-motion (ROM), Pain Visual Analogue Scale (PVAS), American Shoulder and Elbow Surgeon's (ASES) score, Constant score, patient's satisfaction, and re-tear rate were compared between 4-weeks (4W) and 8-weeks (8W) group. All enrolled patients were contacted by telephone to investigate the clinical outcome measurements with PVAS, ASES score, and satisfaction.

Results: The real duration of immobilization was 4.1 weeks in 4W and 7.2 weeks in 8W group. All the preoperative variables including demographic data, ROM, clinical scores, and MRI features were comparable between two groups. There were 9 cases (10%) of full-thickness retear and 88% of patients rated their results as excellent or good. There were 7 delaminated partial re-tears and 5 full-thickness