are comparable to results from open and mini-open repairs. Our study was designed to determine the complication rate of arthroscopic rotator repairs in a series of patients. Methods and Materials: All patients undergoing an arthroscopic rotator cuff repair by the 2 senior surgeons between 2/03 and 7/03 were identified. A total of 263 patients were identified. All charts were retrospectively reviewed looking for size of tear, number of anchors and/or tacks used and any complications following surgery. We divided the complications into major and minor complications. Major complications were defined as those events that required additional operation or re-operation, resulted in neurovascular injury, had technique or hardware failures and resulted in prolonged temporary or permanent disability. Minor complications were defined as those cases that did not require any further surgery buy may have required additional therapies or extended observation. Results: Of the 263 cases, a total of 12 complications were identified. The complication rate for this series of patients was 4.5%. There were 3 major complications and nine minor complications. Major complications included one deltoid detachment and one anchor pullout. Minor complications included 3 patients with adhesive capsulitis, 3 patients with synovitis due to bioabsorbable cuff tacks, and 3 infections that required oral antibiotics. Discussion: Complications following open and mini-open rotator cuff repairs are uncommon. Our study found a complication rate of 4.5% and the majority of the complications were minor. Arthroscopic rotator cuff repair continues to improve as techniques and hardware improves.

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All-Arthroscopic Versus Mini-Open Rotator Cuff Repair: Long-Term Follow-up (SS-10)

All arthroscopic repair has previously been shown to show equivalent short-term outcome and decreased morbidity compared to mini-open repair. Concerns have remained however about both the technical difficulty and long-term outcome of all-arthroscopic repair. From 1/96 to 3/99 501 patients were the subjects of an earlier report in 2000 on the preliminary results contrasting all arthroscopic repair and mini open repair. Two hundred twenty one of these had moderate or large tears or other diagnoses and were excluded, leaving 280 patients for review. 126 chose an all-arthroscopic repair versus 154 with an open repair. These patients were re-reviewed four years later to form the basis of this study. Follow-up averaged 84.3 months for the arthroscopic and 95.8 for open with a minimum of six years. Age, gender, associated findings at surgery, and duration of surgery were not significantly different between the two groups. There were two manipulations and two reoperations for failed repair in the open group (3%) in the early study; one additional repair in the open group failed at longer follow-up. One patient had a loose anchor (1%) using second-generation anchors and better technique. Two patients had early failed repairs and an additional two failed later with a total reoperation rate of 4% (p = ns). Final outcomes as measured by ASES, UCLA and SST scores were not statistically different. All arthroscopic repair is shown to offer a significant reduction in perioperative morbidity over mini open repair. Mid-range follow-up continues to show equivalent outcomes between the two techniques. While the anatomic outcome of the two techniques at mid to long-term follow-up remains unknown, clinical results between the two techniques remains the same.

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Hamstring Function 2 Years Following Anterior Cruciate Ligament Reconstruction Using Semitendinosus-Gracilis Autografts (SS-11)

This retrospective study evaluated the 2 year outcomes (25.8 ± 5 months postsurgery) of 20 patients post-unilateral ACL reconstruction using semitendinosus-gracilis autografts with EndoButton femoral and interference screw-staple tibial fixation. Patients underwent clinical examination including instrumented manual muscle testing of isometric knee flexion-internal rotation torque, conventional and prone isokinetic hamstring torque testing (60° and 180° per second), hop testing, knee arthrometry, modified VAS leg sensation evaluation, IKDC Subjective Knee Evaluation and IKDC Current Health Evaluation. One-way ANOVA were used to evaluate side-to-side differences and multiple regression analysis related these findings to knee function ($P < .05$). Patient activity levels were 6 = competitive, 6 = frequently sporting, 7 = sporting sometimes, and 1 = non-sporting. Involved side knee laxity was 66.7 N (1 ± 1 mm), 89 N (2 ± 2 mm) and 133.4 N (2.7 ± 2.5 mm), respectively. Involved side active knee flexion was decreased 8.2 ± 5°. Peak isokinetic hamstring torque did not display significant side-to-side differences. Involved side isokinetic hamstring work was decreased 76.7 ± 118 J at 60° sec during conventional testing and was decreased 94.4 ± 107 J and 86.3 ± 115 J at 60 ° sec and 180° sec, respectively during prone testing. Isometric testing revealed decreased involved side hamstring torque at 90° flexion-neutral tibial rotation (17 ± 14 Nm), at 120° flexion-neutral tibial rotation (24.5 ± 14 Nm), at 90° flexion-internal tibial rotation (13.2 ± 12 Nm), and at 120° flexion-internal tibial

rotation (23.9 ± 15 Nm). Forward and medial hop tests failed to identify significant differences between extremities. Lateral hopping revealed a 4.9 ± 13 cm involved side decrease. IKDC Subjective Knee Evaluation scores were 86.4 ± 11. Current Health Assessment physical function subscale scores were 94.2 ± 6. Sensation scores were 7.6 ± 2.3 (range = 2-10). Multiple regression revealed that involved side prone isokinetic hamstring work at 60° sec and patient activity level predicted 68% of lateral hop performance ($R^2 = 0.68$). Involved side sensation score and prone isokinetic hamstring work at 60° sec predicted 61% of medial hop performance ($R^2 = 0.61$) and isometric hamstring torque at 90° knee flexion predicted 42% of forward hop performance ($R^2 = 0.42$). Prone isokinetic hamstring work at 60° sec, isometric hamstring torque at 90° flexion, and sensory score were related to patient function at 2 years following ACL reconstruction using a hamstring autograft.

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High School and College Female Athletes: Intermediate-Term Comparison of Bone–Patellar Tendon–Bone Versus Hamstring Anterior Cruciate Ligament Reconstruction (SS-12)

Female athletes are at greater risk for anterior cruciate ligament (ACL) injury than males. Recently, hamstrings (HT) have been a more popular graft choice for this gender and age population. This is in part due to improved cosmesis and potentially less harvest site morbidity. We hypothesize there is no difference in outcome between hamstring versus bone patellar tendon bone (BPTB) ACL reconstruction. Methods: A case-control study of athletic related ACL reconstructions in female high school and college athletes was performed. Participants underwent either HT or BPTB ACL reconstruction and were matched on age at injury, pre-injury activity level, time from injury to surgery (chronicity), and number of giving way episodes prior to surgery. Participating patients completed the IKDC Subjective Knee Form; the Activities of Daily Living (ADLs) and Sports Activity Scale (SAS) of the Knee Outcome Survey; and the SF-36 general health status questionnaire. Patients were seen in follow-up for X-ray evaluation, physical examination, KT-1000 testing, quadriceps torque using Biodex testing, and assessment of functional strength using one-legged hop and vertical jump tests. Paired *t* tests and Bowker's test for correlated proportions were used to compare the HT versus BPTB. Results: Twenty-four matched pairs were included. Average length of follow-up was 5.5 for BPTB and 3.9 years for HT. The side-to-side difference in passive extension was significantly greater in the BPTB (3°) compared to the HT (0°) group. There was a trend for an increased maximal manual KT-1000 in the BPTB group (2.4 vs. 1.2 mm, $P = .08$). The BPTB group had significantly greater avoidance of kneeling and numbness/dysesthesia. There were no significant differences on IKDC, ADLS, or SAS. However, there was a trend for the BPTB group to have higher SF-36 physical component summary scores (56.8 vs. 54.6, $P = .06$). Conclusions: HT grafts for ACL reconstruction in the high school female athlete appear to be at least as effective as BPTB graft reconstructions. This study reinforces that HT is an acceptable alternative with less numbness/dysesthesia, kneeling pain, and loss of extension compared to BPTB.

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Anterior Cruciate Ligament Reconstruction With Quadriceps Tendon Allograft (SS-13)

As the frequency of anterior cruciate ligament (ACL) reconstruction increases, so does the demand for suitable allograft. The purpose of this study was to evaluate the results of ACL reconstruction using a quadriceps tendon allograft. ACL reconstruction with quadriceps tendon allograft has not been previously reported. Twenty-seven patients were evaluated that underwent ACL reconstruction using quadriceps tendon allograft. One surgeon performed all of the ACL reconstructions. The bone plug was placed on the femoral side. The femoral fixation consisted of bioabsorbable interference screw fixation. Bioabsorbable interference screw fixation was also used on the tibial side. Tibial-sided graft fixation was augmented with the use of screw and washer post fixation. An accelerated rehabilitation protocol was utilized for all patients. The average follow-up was 32 months (range 22-50 months). Results were measured with the International Knee Documentation Committee (IKDC) grade, Lysholm score, Tegner scale, single leg hop test and KT-1000. The average patient age was 34 years at the time of surgery. The mean preoperative Lysholm and Tegner scores were 44.4 and 2.9 respectively. These improved to a mean of 91.9 and 5.5 postoperatively. The IKDC grade was normal or nearly normal in all patients. The postoperative single leg hop score averaged 95.0% of the uninjured leg. The KT-1000 evaluations demonstrated a mean side-to-side difference of 1.1 mm (range