patient population. The results of this study suggest that arthroscopic subacromial decompression and rotator cuff repair, if warranted, along with glenohumeral debridement for arthritis consistently improved motion and function in patients with this specific group of pathologies and should be considered as a surgical alternative to shoulder replacement.

Platelet-rich Fibrin Matrix in the Management of Arthroscopic Repair of the Rotator Cuff: A Prospective, Randomized Study (SS-07) *Stephen C. Weber, M.D., Jeffrey I. Kauffman, M.D., Stephen Katz, M.D., Carol Parise, Ph.D., Sophia J. Weber*

Introduction: Arthroscopic rotator cuff repair has led to a high rate of patient satisfaction with clinical outcomes equivalent to open repair at long-term follow-up. Multiple studies however have shown high rates of anatomic failure, approaching 80% in some studies. Techniques such as double-row repair have not been shown to dramatically decrease the rate of anatomic failure in comparative studies. Biological augmentation would seem to be a reasonable technique to improve healing rates. Early, anecdotal studies have suggested both improved healing rates and improvement in perioperative morbidity with platelet-rich fibrin matrix (PRFM). This study represents the first prospective, randomized study to assess these claims.

Methods: The study design was approved by institutional review board. Pre-study power assessment suggested that a sample size of 30 patients in each group would allow detection of a 20% difference in perioperative pain scores. After appropriate informed consent, patients were randomized to arthroscopic treatment either with or without PRFM. All patients had arthroscopic rotator cuff repair performed under general anesthesia using standard suture-anchor technique. Those patients randomized to PRFM had the arthroscopic application of PRFM at the conclusion of the repair as described by Anderson. Post operative rehabilitation was identical between groups. Patients were assessed at one, three, six weeks and three months postoperatively. Serial VAS scores were obtained, as well as SST scores at each interval. Final scores for each group included UCLA and ASES scores.

Results: No complications occurred in either group. All patients had surgery performed as an outpatient procedure without incidence. VAS scores and post operative narcotic use did not differ significantly between the two groups. Serial SST and VAS scores showed a trend at six weeks towards the non-PRFM augmented group, but there was no significant difference at any time between the two groups. Preliminary review of post operative radiographs showed residual defects in both groups; recurrent defects were correlated with patient age ($r=0.88$) and size of tear (0.72) but differences in residual defects in the treated and untreated groups were not significantly different.

Conclusion: Within the power of this study, PRFM was not shown to significantly improve perioperative morbidity. Early clinical results were similar between the two groups. While longer-term follow-up may show differences, early follow-up does not show significant improvement in structural integrity.

Rotator Cuff Repairs Augmented by Platelet Rich Plasma Evaluated with Magnetic Resonance Imaging and Clinical Outcomes (SS-08) *Scott A. Hrnack, M.D., F. Alan Barber, M.D., Onur Hapa, M.D.*

Purpose: To assess the effect of platelet rich plasma augmentation on the clinical outcomes and postoperative healing as measured by magnetic resonance imaging of arthroscopic rotator cuff repairs. Introduction: The incidence of tendon rerupture following rotator cuff repair varies depending upon the patient's age, number of tendons involved, and tear size. Reported retear rates of 80% to 90% exist in the radiology literature and up to 57% in the orthopedic literature. Platelet rich plasma (PRP) has emerged as a new technology believed to stimulate revascularization of soft tissue and increase the concentration of growth factors to improve and accelerate tendon healing. PRP is being used to augment soft tissue reconstructions including arthroscopic rotator cuff repairs. Our hypothesis was that the addition of PRP would result in improved healing of arthroscopic rotator cuff repairs.

Methods: A prospective series of patients undergoing arthroscopic rotator cuff repair was studied. Patients were randomized into PRP and non-PRP groups. All patients had diagnosed rotator cuff tears from both physical examination and preoperative MRI. A single row rotator cuff repair was performed by same surgeon. At the end of the repair, half of the patients had a preformed platelet rich plasma globule sutured into the repair site. Postoperative rehabilitation was held constant. Postoperative MRIs were obtained at as early as 3 months after surgery to evaluate the presence of rotator cuff defects, their size, muscular fatty atrophy, and any tendon retraction. Additional outcome measures used included the ASES, Rowe, SANE, Simple Shoulder Test, and Constant score.

Results: 34 patients (9 females, 25 males) with average age 57 years (range, 43-69) were enrolled in the

study. Average follow up was 15.6 months (range, 6-32). All underwent postoperative MRIs at an average of 4.5 months (range, 3-10) after surgery. A total of 17 patients (Groups 1) had platelet rich plasma sutured at the repair site. 59% (10 of 17) had persistent tendon defects on MRI. Group 2 included 17 patients without a PRP sutured globule sutured into the tendon repair site (control group). 94% (16 of 17) of Group 2 demonstrated a persistent tendon defect on MRI ($p < 0.01$). There was no significant difference between Groups (1 and 2) for ASES (95.7 and 90.0; $p=0.13$), Rowe (94.5 and 88.5; $p=0.09$), SANE (91.1 and 87.7; $p=0.51$), Simple Shoulder Test (11.3 and 10.9; $p=0.36$), and Constant (89.4 and 83.5; $p=0.16$) scores.

Conclusion: Patients whose arthroscopic cuff repairs included a PRP globule demonstrated fewer retears (56%) than cuff repairs without PRP globules (94%). However, there was no clinical difference using standard outcome measures.

Augmentation of Tendon Healing with Butyric Acid-Coated Suture: Biomechanical Evaluation in a Rabbit Model (SS-09) *Bryan T. Leek, M.D., James P. Tasto, M.D., Michael P. Linn, M.D., Robert Healey, M.S., John P. Brady, M.D., David P. Amiel, Ph.D.*

Introduction: Butyric acid (BA), in the appropriate concentration, has been shown to be angiogenic and to enhance transcriptional activity in tissue. These properties of BA have the potential to augment biologic healing in a repaired tendon. The purpose of this study is to evaluate this possibility through the comparison of biomechanical properties of healing tendons repaired with BA-coated suture versus control suture.

Methods: A rabbit Achilles tendon model was used to evaluate the biomechanical strength of tendon healing at six weeks in twenty-three rabbits repaired either with BA-coated Ultrabraid (Smith & Nephew Endoscopy, Andover, MA) suture ($n=14$), or control Ultrabraid suture ($n=9$). Unilateral tendon defects were created in the middle bundle of the Achilles tendon of each rabbit, which were repaired equivalently with either BA-coated suture or control suture. The samples were harvested at six weeks post-repair and biomechanically tested using Video Dimension Analysis to determine sample stiffness.

Results: At six weeks after repair, the tendon samples repaired with BA-coated suture had significantly increased stiffness relative to the tendons repaired with control suture. The Young's modulus was 84.9 ± 11.5 MPa in the BA group and 58.8 ± 15.2 MPa in the control group ($p<0.05$).

Conclusion: Tendons repaired with BA-coated sutures demonstrated improved biomechanical properties at six weeks in a rabbit model. These findings are encouraging as a relatively simple alteration of suture material may augment early tendon healing to create a stronger repair construct during this time.

A Prospective, Randomized Evaluation of Acellular Human Dermal Matrix Augmentation for Arthroscopic Cuff Repair (SS-10) *F. Alan Barber, M.D., Joseph P. Burns, M.D., Allen Deutsch, M.D., Marc R. Labbe, M.D.*

Introduction: Tendon tears or tissue failures after rotator cuff repair are reported to occur for some age groups in as many as 60%. In an effort to avoid retears, augmentation of the deficient rotator cuff repair with the incorporation of a biologic tissue scaffold has been advocated. The purpose of this study was to prospectively evaluate the effectiveness of arthroscopic acellular human dermal matrix augmentation on rotator cuff repair and to determine whether rotator cuff repair augmentation differs with respect to safety, when compared to standard suture and anchor repair.

Methods: 47 patients were prospectively randomized by means of sealed envelopes opened at the time of surgery to rotator cuff repair with acellular human dermal matrix augmentation (Group I) or repair without augmentation (Group II). In addition, each participating investigator in this multicenter study performed the rotator cuff repairs exclusively by an arthroscopic approach throughout the entire enrolment period. Preoperative and postoperative functional outcome assessments were obtained using the Constant-Murley and American Shoulder and Elbow Surgeons (ASES) scales. MRI evaluation of these repairs was also obtained at 12 months. Patients were followed for a minimum 12 months after surgery. Adverse events were recorded.

Results: There were 24 patients in Group I and 23 in Group II with a mean age of 56 years. 33 were male and 14 female. 32 had acute cuff tears and 15 chronic tears. The Constant-Murley scores were 89.6 (SD 9.4) for Group I and 85.7 (SD 9.9) for Group II. ASES scores were 95.1 (SD 4.8) for Group I and 93.2 (SD 7.9) for Group II. There were no significant differences between the two groups for either the Constant-Murley scores or the ASES scores. One retear was documented by MRI in each group. Adverse events in Group I included recurrent shoulder bursitis and one rotator cuff retear. Group II adverse events included cellulitis in 2, shoulder bursitis, post-traumatic fibrosis, one rotator cuff retear, and a