

fragments. At an average follow-up of 4.9 months (range 1 month to 4.3 years) two patients required partial meniscectomy (1 at 5 months and 1 at 6 months) for non-healing. No patient had neurovascular complications or fixators palpable under the skin.

Walter R. Shelton, M.D., Shaun Holt, M.D.

Preoperative and Postoperative Magnetic Resonance Arthrograms in Shoulders After Arthroscopic and Open Anterior Stabilization in a Prospective, Randomized, Clinical Trial (SS-28)

To evaluate preoperative gadolinium-enhanced MR arthrograms (MRA) with MR arthrograms obtained six months postoperatively in shoulders that have undergone either arthroscopic or traditional open anterior stabilization using a bioabsorbable suture anchor in a prospective, randomized clinical trial. Sixty consecutive patients who presented with chronic anterior shoulder instability who failed at least six months of nonoperative treatment were randomized to either arthroscopic or open stabilization groups. All patients underwent MR arthrograms preoperatively, the findings of which were compared to intraoperative pathology. Six months following anterior stabilization, 45 of the 60 patients underwent a second MR arthrogram to assess 1) postoperative changes in comparison to the pathology noted on preoperative studies, 2) the postoperative MRA differences between open and arthroscopic stabilization, 3) early clinical results in comparison to postoperative MRA changes. Intraoperative findings correlated well with pathological changes noted on preoperative MRA. In 90% of the postoperative shoulders at MRA, a type I "seamless" anatomical restoration of the capsulolabral complex was noted regardless of operative technique. In 10% of the cases, a type II "cleft" or type III "noncontiguous" capsulolabral attachment site was noted. These MR findings, however, did not correlate well with clinical results, subjective shoulder ratings or patients' perception of stability. Preoperative MR arthrograms in shoulders with anterior instability allow an accurate diagnosis of intra-articular pathology that correlates well with operative findings. Arthroscopic and open stabilization techniques result in similar intra-articular findings by MRAs at six months postoperatively. The MRA studies that demonstrated less than anatomical restoration of the capsulolabral complex postoperatively correlated poorly with subjective and objective clinical outcomes.

Craig R. Bottoni, M.D., Eric L. Smith, M.D., Alex D. Freitas, M.D.

Results of Arthroscopic Bankart Repair Using Suture Anchors in Traumatic Anterior Shoulder Instability (SS-29)

Background: The purpose of this study was to prospectively evaluate the surgical outcome of arthroscopic Bankart repair using suture anchors in patients with recurrent traumatic anterior shoulder instability with a minimum follow-up of two years. **Materials:** We studied 53 patients with a mean age of 25.3 years (16-41). The study group consisted of 45 men and 8 women. The mean follow-up was 2.2 (2-4.3) years. Patients were evaluated prospectively according to the Rowe-score. **Results:** After 2.2 years 3 patients suffered from a single redislocation, 2 patients had recurrent dislocations which means an overall redislocation rate of 9.4%. Three of the five redislocators had a traumatic redislocation. The average Rowe-score increased to 92.4 points from 32.1 points preoperatively. At final follow-up, 85.9% of the patients had returned to their preoperative sports level. **Conclusions:** Our results in this series demonstrate the efficacy of arthroscopic bankart for the treatment of recurrent traumatic anterior shoulder instability repair using suture anchors. It allows the surgeon to reliably correct the labral detachment and the capsular redundancy while preserving motion and minimizing morbidity. Although it is a highly demanding technique, it can yield comparable results to open procedures when a correct indication is carried out.

Bjoern Marquardt, M.D., Wolfgang Poetzl, M.D., Kai-Axel Witt, M.D., Stefan Garmann, M.D., Joern Steinbeck, M.D.

Arthroscopic Bony Bankart Repair for Chronic Recurrent Traumatic Anterior Glenohumeral Instability (SS-30)

Purpose: A bony Bankart lesion associated with chronic recurrent traumatic glenohumeral instability has traditionally been treated with only soft tissue repair and/or open bone grafting if the glenoid defect was large. However, we recognized that the bony Bankart lesion could be reconstructed arthroscopically, even if it was chronic with a large osseous defect, because it is possible to separate the bony fragment from the glenoid neck together with the labroligamentous complex. The purpose of this study was to evaluate the postoperative outcome of an arthroscopic bony Bankart repair for chronic recurrent traumatic anterior glenohumeral instability, including "inverted-pear" type glenoid bone deficiency. **Methods:** A consecutive series of 41 shoulders with chronic recurrent traumatic glenohumeral instability underwent arthroscopic bony Bankart repair. Subjects

included 37 males and 4 females with an average age of 23 years old. All shoulders were evaluated by three-dimensionally reconstructed computed tomography (3DCT) preoperatively, which confirmed a bony fragment at the anteroinferior portion of the glenoid. The average bone loss against the lower part of the circular glenoid portion was 7.3% (range, 2.1-20.9) as measured by our original calculation method using 3DCT. In all shoulders, a displaced bony fragment, firmly attached to the labroligamentous complex, was separated from the glenoid neck before a reduction and fixation to the optimal position was achieved utilizing suture anchors. All patients were assessed using the Rowe scoring system at a minimum 24 months postoperatively. Results: The Rowe score improved postoperatively in all shoulders ($P < .01$). The average Rowe score at the time of mean follow-up of 31 months (range, 24-47) was 94.3 (range, 40-100) with 40 out of 41 shoulders graded as excellent or good (97.6%). One noncompliant patient experienced a redislocation 3 months postoperatively during soccer play before receiving permission to return to full sports activity. Thirty-eight out of 39 active sports participants returned to their preinjury sports. Conclusions: Arthroscopic bony Bankart repair utilizing suture anchors yields a successful outcome in shoulders with chronic recurrent traumatic anterior glenohumeral instability. This study demonstrates that the bony reconstruction together with the attached labroligamentous complex can bring a favorable outcome even in athletes and also suggests that this technique might obviate the necessity of open bone-grafting in patients with "inverted pear" type glenoid.

Hiroyuki Sugaya, M.D., Joji Moriishi, M.D., Izumi Kanisawa, M.D., Akihiro Tsuchiya, M.D.

The Capsular Split-Shift Procedure for Anterior-Inferior Shoulder Instability: Long-term Follow-up (SS-31)

The capsular split-shift procedure for anterior-inferior shoulder instability has been performed using suture anchors since 1995. Presented here is the long-term evaluation of 43 patients who had suture anchor repairs with a minimum of 6 year follow-up. Two of these patients could not be located for final follow-up. Of the remaining 41 patients 33 were re-examined and 8 had telephone interviews. All of these patients had a Bankart lesion. The average age was 24. Thirty five patients had suffered full dislocations, 6 patients had feelings of chronic subluxation without a documented dislocation. Three of the dislocators also had posterior instability, i.e.

they had MDI. Repairs were done acutely in 8 patients and delayed 2 months to 13 years in the chronic group. The same technique was used in every case: After complete mobilization of the capsule off of the underlying subscapularis, an inferior split (usually 1 cm) was made from the inferior pole of the glenoid into the axillary pouch. Then No. 1 PDS was inserted into the capsule, threaded through a G2 Mitek anchor and the anchor inserted into the glenoid rim. The sutures and anchors are placed so that they superiorly advance the capsule, opening the split to oppose the glenoid neck. Usually three suture-anchor pairs were employed. Only in the three MDI cases, posterior suture plication was also done. There were no interval closures in this group. There were no recurrences in the acute repair group. In the chronic group there were 3 recurrent dislocations (7.2%) and 2 patients with persistent symptoms of subluxation but without a frank recurrent dislocation (4.8%) yielding a total failure rate of 12%. This is higher than what was found in my previous study with shorter term follow-up (6.9%). One cause of failure in one patient in the dislocation group and in one patient in the subluxation group was a large Hill Sachs lesion. Given what is now known about bone loss and recurrence, if these patients were operated on today, they would have had a bone augmentation procedure in addition to their repair. Eliminating these two patients, the overall failure rate is reduced to 7.3% at minimum 5 year follow-up. All of the patients without a recurrence were satisfied. 90% of athletes with no recurrence returned to their sport but only 74% felt that they had returned to pre-injury levels. 58% of patients recovered full ROM. 32% lost 5°-10° of ER, 10% lost 10°-15° of external rotation. In order to further reduce the recurrence rate, treatment of an interval lesion is now performed in selected cases. The decision to close the interval is based on whether the patient has a positive sulcus sign that does not reduce with external rotation and/or arthroscopic finding of a patulous rotator interval. There have been no short-term recurrences using selected interval closure and elimination of patients with excessive bone loss.

Joseph C. Tauro, M.D.

Hill-Sachs "Remplissage": An Arthroscopic Solution for the Engaging Hill-Sachs Lesion (SS-32)

The purpose of this paper is to present a new arthroscopic approach to a subset of instability patients that present with a combination of bony lesions. These lesions of the glenoid (bony Bankart, fractures, erosion), and humerus (Hill-Sachs) have long been established as significant contributing pathology in recurrent shoulder instability.