Arthroscopic Treatment for Pigmented Villonodular Synovitis of the Shoulder Associated With Massive Rotator Cuff Tear

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Purpose: Our purpose was to investigate arthroscopic treatment of patients diagnosed with pigmented villonodular synovitis (PVNS) of the shoulder and massive rotator cuff tear with the initial presentation of large, recurrent joint effusion. **Methods:** From December 2005 to June 2007, 5 patients (3 males and 2 females) diagnosed with PVNS of the shoulder and massive rotator cuff tear were treated with arthroscopic synovectomy, partial cuff repair, or debridement if the cuff was irreparable. All 5 patients were followed-up for a mean of 22.4 months (range, 12 to 33 months). Outcomes were measured with use of the American Shoulder and Elbow Surgeons (ASES) and University of California at Los Angeles (UCLA) scoring systems. Two patients received partial rotator cuff repair by suture anchors and another 2 received suture repairs only. All of the patients had residual tear with variable sizes. **Results:** With a mean follow-up of 22.4 months (range, 12 to 33 months), the mean ASES and UCLA scores improved from preoperative values of 48.2 and 7.8 to 80.0 and 29.6 points, respectively ($P < .05$). All patients were satisfied with the procedure, and no signs of recurrence were noted during the follow-up period. **Conclusions:** Five cases of PVNS of the shoulder and massive rotator cuff tears with the initial symptoms of shoulder effusion and function limitation were reported. After arthroscopic synovectomy and partial rotator cuff repair or debridement, all patients gained symptomatic and limited functional improvement at an average follow-up of 22 months. **Level of Evidence:** Level IV, therapeutic case series. **Key Words:** Arthroscopy—Pigmented villonodular synovitis—Rotator cuff tear—Synovectomy—Shoulder—Treatment.

Pigmented villonodular synovitis (PVNS) is a benign tissue proliferation in synovial structures. This rare condition affects approximately 1.8 cases per 1 million persons.[1] The peak incidence of PVNS is between 30 and 50 years of age, and both genders are affected equally.[2] This disease is usually monoarticular, and about 80% of cases involve the knee joint. PVNS in other joints—including the hip, ankle, small joint of the hand, elbow, and shoulder—has been reported. Because of the rarity of PVNS in the shoulder, there was limited information for the optimal treatment and outcome in the literature. We report our experience and the clinical outcome after arthroscopic synovectomy and rotator cuff repair in PVNS of the shoulder. With an average follow-up period of 22.4 months, we hypothesized that arthroscopic synovectomy and rotator cuff repair were effective in the treatment of this disease.

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METHODS

Patient Selection

Between December 2005 and June 2007, there were 5 patients (3 male and 2 female) ranging from 60 to 83

years of age who had been diagnosed with PVNS of the shoulder. The diagnosis of PVNS and rotator cuff tear was made and the presence of joint effusion was confirmed by preoperative magnetic resonance imaging (MRI) and confirmed by pathology from intraoperative tissue sampling. All of the lesions were located on the right shoulder, and the right side was dominant in all cases. Preoperative symptoms of shoulder pain and swelling were experienced an average of 31.3 months before therapy (range, 3 months to 10 years). All 5 patients had local swelling preoperatively, and only 1 patient had a history of trauma (Table 1).

Surgical Technique

The operative procedure was modified from the technique described by Burkhart.[3] Patients were placed in the beach chair position, and general anesthesia was administered. Arthroscopic total synovectomy and debridement of the chondral lesion was performed with an arthroscopic shaver. Mobilization of the retracted cuff tendons was done first. Side to side stitches with No. 2 Ethibond nonabsorbable suture (Ethicon, Somerville, NJ) and suture anchors (Revo; Linvatec, Largo, FL) were used for cuff repair. Tissue samples from synovial tissue were stained with hematoxylin and eosin stain and reviewed under a light microscope by a pathologist who specialized in musculoskeletal pathology.

Postoperative Rehabilitation

Postoperatively, the drain was removed after 1 or 2 days. Each patient's shoulder was immobilized in an arm sling for 2 weeks and started passive mobilization after 4 weeks. Active exercise began at 6 weeks postoperatively, and resistance exercise started 4 weeks later. Patients were followed up at 2, 6, and 12 weeks postsurgery and every 3 months thereafter. Postoperative radiotherapy and chemotherapy were not considered because there was limited information of adjunctive therapy for PVNS of the shoulder and potential complications. Plain radiographs were taken in the immediate postoperative period and then at both 6 and 12 months.

Outcome Instruments

American Shoulder and Elbow Surgeons (ASES)[4] and modified University of California at Los Angeles (UCLA)[5] scores were recorded for functional assessment preoperatively and at the final follow-up appointment. These 2 scoring systems contained both a patient-derived subjective assessment and a physician-derived objective assessment and have been widely used for outcomes assessment.

Statitical Analysis Tools

Statistical analysis was performed with SPSS (version 11.0; SPSS, Chicago, IL) software package with Wilcoxon signed ranks test. $P < .05$ was considered significant.

RESULTS

Operative Findings

Under arthroscopy, all the shoulder joints were filled with brownish, hyperemous synovium, and a villous tumor lesion was noted over the subacromial area. Massive rotator cuff tears with grade 4 chondromalacia throughout both the humeral and glenoid cartilage were noted in all patients (Fig 1). Arthroscopic total synovectomy and subacromial space shaving were performed. Two patients received rotator cuff repair by suture anchors and side to side suture repair, another 2 received partial repairs by sutures only, and arthroscopic debridement was performed in 1 patient. All of the patients had residual tears with variable sizes (Fig 2). The average operation time was 94 minutes.

Table 1. *Demographic Data*

Patient No.	Age/Sex	Side	Duration of Preoperative Symptoms (mo)	Effusion (by MRI)	Torn Rotator Cuff Tendon	Follow-Up (mo)
1	83/M	R	3	+	SST + IST	30
2	60/F	R	24	+	SST + IST	19
3	67/M	R	12	+	SST + SUB	18
4	78/M	R	120	+	SST + IST	33
5	70/F	R	2	+	SST + SUB + IST	12

Abbreviations: IST, infraspinatus tendon; MRI, magnetic resonance imaging; R, right; SST, supraspinatus tendon; SUB, subscapularis tendon.