



Adhesive Capsulitis of the Shoulder in Patients with Diabetes

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ABSTRACT

Background: Adhesive capsulitis of the shoulder is common in patients with diabetes. The exact etiology is unknown. The aim of this study is to evaluate the results of subacromial bursal corticosteroid injections and a home program of Codman's exercises in a cohort of diabetic patients with adhesive capsulitis.

Materials and methods: Twelve diabetic patients with adhesive capsulitis treated from November, 2011 to February, 2013 in an outpatient clinic were evaluated. The age range was 40 to 64 years with a mean age of 52. There were six males and six females. Six patients had involvement of the right shoulder, four had involvement of the left and two patients had bilateral shoulder involvement. The dominate upper extremity was affected in nine patients. There were 11 patients with type 2 diabetes and one with type 1 diabetes. All patients had an insidious onset of pain and stiffness in the affected shoulder. There was poorly localized tenderness about the shoulder with restricted abduction, forward flexion and internal rotation limited to the level of the buttocks or below. There were abnormal imaging studies in seven of the 12 patients. Five patients did not have imaging studies. Edema and thickening of rotator cuff tissue was the most frequent finding on magnetic resonance imaging (MRI). There was one small rotator cuff tear and one small labral tear. Patients were treated with a subacromial bursal space injection with 2 to 3 ml of 2% lidocaine and one milliliter of betamethasone sodium phosphate and sodium acetate (6 mg/ml). Following the injection, passive stretching of the involved shoulder was done for a few minutes. The patients were instructed in Codman's exercises and wall climbing.

Results: Good pain relief was experienced by 11 patients with only fair relief in one. The average range of motion post-treatment was greater than 110° forward flexion and greater than 140° abduction. Internal rotation was possible to the L3 level. Two patients had a recurrence of symptoms at 6 and 12 months, and both were treated with reinjection and subsequent symptomatic improvement. There were no complications, though some patients had a transient rise in their blood sugar following injection.

Conclusion: Subacromial bursal injections coupled with Codman's exercises are effective in treating adhesive capsulitis of the shoulder in diabetic patients.

Keywords: Diabetic, Adhesive capsulitis, Subacromial injection.

Level of evidence: IV

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INTRODUCTION

The term adhesive capsulitis was coined by J Neviaser in 1945.¹ Bridgman found that adhesive capsulitis was five times more prevalent in the shoulders of patients with diabetes than in nondiabetic controls.² He also reported that type 1 diabetics were more commonly affected than those with type 2 diabetes. The exact etiology of adhesive capsulitis is not known. The initial presentation is inflammatory followed by fibrosis and collagen deposition. Rodeo et al found the presence of cytokines to be involved in the pathogenesis.³ Tendonitis and tendinopathies are frequently seen in diabetics. The aim of this study was to evaluate the treatment of adhesive capsulitis by subacromial bursal corticosteroid injections and Codman's exercises in a cohort of diabetic patients in an outpatient clinic.

MATERIALS AND METHODS

Twelve diabetic patients with adhesive capsulitis were evaluated and treated from November, 2011 to February, 2013 in an outpatient clinic with 27% of the patients having diabetes. The age range in this cohort was 40 to 64 years with a mean age of 52. There were six males and six females. Six patients had involvement of the right shoulder, four had involvement of the left shoulder and two patients had involvement of both shoulders. The dominant extremity was affected in nine patients. There were 11 patients with type 2 diabetes and one with type 1 diabetes. All patients had an insidious onset of pain and stiffness in the affected shoulder, usually manifesting itself in the morning. Duration of symptoms varied from a few months to 1 year. Minor trauma was reported prior to the onset of symptoms in a few patients. Some patients tried a course of physical therapy and nonsteroidal anti-inflammatory medications prior to being seen. There was poorly localized tenderness about

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the anterior and posterior aspects of the involved shoulder. Range of motion was restricted in all planes of motion and was most notable in abduction, forward flexion and internal rotation. The latter was limited to the level of the buttocks or below, thereby making perineal hygiene difficult for those patients with dominant extremity involvement.

There were abnormal imaging studies in seven of the 12 patients, while five patients did not have imaging studies. Edema and thickening of rotator cuff tissue, as seen in four of the cohort patients, was the most frequent finding on MRI. There was one small rotator cuff tear and one small labral tear. Two patients had early glenohumeral arthritis. Patients were treated with a subacromial bursal space injection with 2 to 3 ml of 2% lidocaine and 1 ml of betamethasone sodium phosphate and sodium acetate (6 mg/ml). Injections were conducted with the patient sitting with the involved extremity unsupported. Both anterior and posterior approaches to the subacromial space were used. There was no attempt made to enter the capsule of the glenohumeral joint or to distend the capsule with fluid. Immediately following the injection, passive stretching of the involved shoulder was done for a few minutes in an attempt to regain motion. This was well tolerated in all patients. Patients were instructed in Codman's exercises and wall climbing. If the patient was making progress at the 6 to 8 weeks check, then they were advised to continue their home program of Codman's exercises and return for follow-up in 4 months.

RESULTS

Good pain relief was experienced by 11 patients with only fair relief in one patient. On the visual analog scale (VAS), 11 patients self-reported a value of three or less at follow-up. The average range of motion was greater than 110° in forward flexion, greater than 140° in abduction and internal rotation was at or above the L3 level at the 6-month visit. Two patients had a recurrence at 6 and 12 months. Both were treated with reinjection and subsequently improved. There were no complications. Some patients reported a transient rise in their blood sugar following injection, which did not require any treatment. There were no infections or local reactions to the injections.

DISCUSSION

Tighe and Oakley reported a total prevalence of adhesive capsulitis of 38.6% in diabetics and nearly 33% in pre-diabetics.⁴ They suggested that patients presenting with adhesive capsulitis be evaluated for diabetes. It is likely that the majority of the patients in this cohort presented during the acute inflammatory stage of the disease process prior

to the onset of significant fibrosis of the shoulder bursae and capsular contractures, which occurs several months following the onset of symptoms.^{5,6}

Of interest is the immediate response of pain relief to the small volumes of local anesthetic placed in the subacromial space and the improvement in range of motion. This might implicate an extracapsular, rather than an intracapsular, location of the underlying process of adhesive capsulitis. Rodeo et al found the presence of cytokines, namely transforming growth factor-beta, platelet derived growth factor and hepatic growth factor in high concentrations in the synovium and shoulder capsule in patients with adhesive capsulitis.³ In four of the seven patients who had MRI studies, edema and thickening was noted in the vicinity of the subacromial bursa and rotator cuff tissue. MRI studies report capsular thickening, especially in the axillary pouch of patients with adhesive capsulitis.⁷⁻⁹ Two of the 10 patients had recurrence within 6 months of their index treatment, and both responded to repeat injection. Several authors have reported good results with a combination of corticosteroid injections and physical therapy.¹⁰⁻¹³ Compliance with a home program of Codman's exercises is key to regaining a functional range of motion. There was no indication to treat any of these patients with manipulation under anesthesia or arthroscopic releases.¹⁴⁻¹⁷ Although some patients reported a transient rise in blood sugar this did not require any additional treatment or medication.

CONCLUSION

Subacromial bursal injections coupled with a home program of Codman's exercises are effective in treating adhesive capsulitis of the shoulder in diabetic patients.

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