International Journal of Orthopaedics Research
www.orthopaedicsjournal.in
E-ISSN: 2663-0923, P-ISSN: 2663-0915
Received: 24-03-2020, Accepted: 16-04-2020; Published: 25-04-2020
Volume 2; Issue 2; 2020; Page No. 08-10

Functional outcome of subacromial injection of corticosteroid mixed with local anesthestic for management of shoulder impingement syndrome

Qazi Waris Manzoor MS[1], Tabish Tahir Kirmani MS[2*], Khurshid Ahmad Kangoo MS[3]
[1, 2] Senior Resident, Department of Orthopedic Surgery, Government Hospital for Bone and Joint Surgery, Barzulla, Srinagar, Jammu and Kashmir, India
[3] Professor, Department of Orthopedic Surgery, Government Hospital for Bone and Joint Surgery, Barzulla, Srinagar, Jammu and Kashmir, India

Abstract
Introduction: Shoulder Impingement is a common cause of shoulder pain. The concept of the impingement syndrome was popularized by Neer who described a clinical test involving maximal passive forward elevation of the shoulder, known as the Neer impingement sign. Once diagnosed, the initial therapy for subacromial impingement syndrome is nonsurgical, and may include modification of activities, analgesic nonsteroid anti-inflammatory drugs, cryotherapy, ultrasound, electromagnetic radiation, corticosteroid injection and physical therapy. In this study we evaluate the short term functional outcome of subacromial injection of corticosteroids and local anesthesia for the treatment of painful subacromial impingement syndrome.
Methods: Ninety six patients with shoulder pain characteristic of subacromial impingement syndrome were included in the study from 2015 to 2019. We had 59 males and 37 females. The mean age in this study was 56.5 years (range 32-69 years). Sixty nine patients had right sided involvement (all dominant) and 27 patients had left sided involvement. The mean duration of symptoms prior to injection was 5.6 months (range 2-14 months). Functional status was assessed using the Constant score, pain was assessed using a visual analog scale, and range of motion was measured with a goniometer. Each qualified patient was given an injection of 2 ml tricort (80mg triamcinolone) and 2ml of 2% Xylocaine suspension with a 21-gauge needle into the subacromial space with a standardized posterolateral approach. A reduction of pain with increased active abduction after injection clinically confirmed accurate placement. At the 4-week visit, the Constant score, visual analog scale for pain, and range of motion were reassessed.
Results: Eighty five patients achieved improvement in the amount of pain and range of motion. The mean improvements in the active range of motion of forward flexion, abduction, internal rotation and external rotation were 54°, 34°, 16° and 19°, respectively. The total Constant's scores were 44 before injection and 79.6 after injection.

Keywords: shoulder impingement syndrome, subacromial injection, corticosteroids, short term results

Introduction
Shoulder Impingement is a common cause of shoulder pain [1]. The concept of the impingement syndrome was popularized by Neer [2]. who described a clinical test involving maximal passive forward elevation of the shoulder, known as the Neer impingement sign. Hawkins and Kennedy [3]. described another provocative test for impingement syndrome involving forward flexion of the shoulder to 90° combined with internal rotation. These two passive clinical tests are commonly used to evaluate patients with shoulder pain and are believed to be reliable indicators of subacromial impingement. Neer [2]. also described an impingement test that documents the patient's response to an injection of 10 mL of 1% lidocaine into the subacromial space. After the local anesthetic is introduced under the acromion, the impingement sign is repeated. If there is significant reduction or elimination of the patient's pain, this constitutes a positive test result and strongly suggests a diagnosis of shoulder impingement syndrome. Local anesthetic injection with or without corticosteroids into the subacromial space is thought to be an effective therapy for impingement syndrome [4-10]. Once diagnosed, the initial therapy for subacromial impingement syndrome is nonsurgical, and may include modification of activities, analgesic nonsteroid anti-inflammatory drugs, cryotherapy, ultrasound, electromagnetic radiation, corticosteroid injection and physical therapy [11-13]. In this study we evaluate the short term functional outcome of subacromial injections of corticosteroids and local anesthesia for the treatment of painful subacromial impingement syndrome.

Patients and Methods
96 patients with shoulder pain characteristic of subacromial impingement syndrome were included in the study from 2015 to 2019. Following were the inclusion criterias; (1) the symptoms had lasted for at least 2 months, (2) Neer or Hawkins impingement signs were positive, (3) there was no evidence of os acromiale on plain radiographs, and (4) the patient was not involved in a Workers' Compensation case.(5) a shoulder USG

suggestive of shoulder impingment or subacromial bursitis. patients excluded from the study were those having features suggestive of rotator cuff tear on clinical examination (positive drop arm test) or utrasonography, septic shoulder (erythema, swelling, local heat), shoulder instability (apprehension test positive, relocation test positive), cervical spondylosis (Spurling test positive), biceps tendonitis (Yergason test positive, Speed test positive) and acromioclavicular joint pain.

We had 59 males and 37 females. The mean age in this study was 56.5 years (range 32-69 years).69 patients had right sided involvement (all dominant) and 27 patients had left sided involvement. The mean duration of symptoms prior to injection was 5.6 months (range 2-14 months). No patient had a previous history of significant shoulder trauma. Each patient complained of shoulder pain with progressive motion limitation for more than two months, which was not relieved by various nonsurgical treatments. Prior to receiving the injection, functional status was assessed using the Constant score [14], pain was assessed using a visual analog scale, and range of motion was measured with a goniometer. After completing the initial evaluation, each qualified patient was given an injection of 2 ml tricort (80mg triamcinolone) and 2ml of 2% Xylocaine suspension with a 21-gauge needle into the subacromial space with a standardized posterolateral approach. The landmarks for the injection were the acromion and the coracoid process. The posterolateral shoulder was prepped with alcohol and the needle was inserted 2 cm inferior and 1 cm lateral to the posterolateral edge of the acromion. The needle was directed from posterior to anterior in the direction of the coracoid process. A reduction of pain with increased active abduction after injection clinically confirmed accurate placement [2]. Approximately 5 minutes after the injection, ROMs were reassessed. All of the patients were advised to do gentle ROM exercises at home and instructed to follow-up in 4 weeks [15]. At the 4-week visit, the Constant score, visual analog scale for pain, and range of motion were reassessed.

Results

At the follow-up evaluation four weeks after the injection, 85 patients achieved improvement in the amount of pain and range of motion.

The mean improvements in the active range of motion of forward flexion, abduction, internal rotation and external rotation were 54°, 34°, 16° and 19°, respectively. Pre-injection and post-injection shoulder range of motion is shown in Table 1. The Constant's score was employed to rate pain and function before injection and at follow-up (Table 2). The total Constant's scores were 44 before injection and 79.6 after injection.

Table 1: Shoulder Range of Motion Before and Four Weeks After Injection

Shoulder Motion	Before Injection	After Injection
Forward Flexion	105°	159°
Internal Rotation	29°	45°
External Rotation	30°	49°
Abduction	46°	80°

Table 2: Functional Evaluation Before and Four weeks After Injection According to Constant's Score

	Normal	Before injection	After injection
Pain	15	4	11
Activities	20	8	16
Activity level	10	3	8
Position	10	5	8
Range of motion	40	27.5	36.5
Abduction	10	7.5	9.5
Flexion	10	6.5	9
Internal rotation	10	7.0	8.9
External rotation	10	6.5	9.1
Power	25	9	13
Total	100	48.5	76.5

Discussion

Subacromial impingement syndrome and associated rotator cuff tendinitis are common shoulder problems with the symptoms of pain and loss of motion [16]. The classically accepted underlying pathologies causing these symptoms are oedema, haemorrhage, fibrosis, tendinitis and partial or complete ruptures of the rotator cuff tendons at different stages of the syndrome [2]. Many operative or nonoperative treatment modalities aim to treat these conditions by decreasing the inflammation and stimulating the healing in the tendons. However, the exact healing mechanisms remain partly unknown and this fact leads to use of many empirical conservative treatment methods such as ergonomics at work, NSAID, rest, superficial heat, ice, movement exercises, acupuncture, ultrasound therapy, strengthening exercise, stretching and transcutaneous electrical nerve stimulation [17]. One of these methods is subacromial corticosteroid injection and the current trend is to consider this method when other therapeutic conservative interventions fail to treat the condition [17, 18]. Some authors claim that corticosteroids can inhibit the production of collagen and the surrounding granulation tissue, thus prevent fibrosis, in addition to suppress inflammation [19]. Blair *et al*. observed an increase in shoulder range of motion with subacromial corticosteroid injection, which we also observed in our study [4]. Green reported that subacromial corticosteroid injection was better than placebo in improving range of motion [20]. The improvement in the joint range of motion may be due to pain relief and effect of fibrosis prevention effect, which consequently facilitates daily living activities This study has several limitations. The follow-up was limited to 4 weeks, with only a single injection. Most practitioners will perform multiple subacromial injections. Our short-term results do not address the long-term effects. The physical exam and assessment of range of motion was limited as we did not examine scapular motion. Increased motion of the scapula can mimic glenohumeral motion. When injecting the subacromial space, we used immediate improvement in active shoulder abduction as an indicator of accurate placement. There is a high incidence of non-bursal injections of the shoulder; advanced imaging technology like ultrasound guidance would have been a more accurate method of injection. However, the short term results of

subacromial injection of corticosteroids and local anesthesia show that it is an effective, safe and simple therapy for symptomatic subacromial pathologies, such as impingement pain, tendonitis and bursitis. The injection can substantially reduce shoulder pain and increase range of motion.

References

1. Neer CS. Anterior acromioplasty for the chronic impingement syndrome in the shoulder: A preliminary report. J Bone Joint Surg Am. 1972; 54:41-50.
2. Neer CS. Impingement lesions. Clin Orthop. 1983; 173:70-77.
3. Hawkins RJ, Kennedy JC. Impingement syndrome in athletes. Am J Sports Med. 1980; 8:151-158.
4. Blair B, Rokitto AS, Cuomo F. Efficacy of injections of corticosteroids for subacromial impingement syndrome. J Bone Joint Surg Am. 1996; 78:1685-1689.
5. Hollingworth GR, Ellis RM, Hattersley TS. Comparison of injection techniques for shoulder pain: Results of a double blind, randomized study. Br Med J. 1983; 287:1339-1341.
6. Adebajo AO, Nash P, Hazleman BL. A prospective double blind dummy placebo controlled study comparing triamcinolone hexacetonide injection with ora dicofenac 50 mg TDS in patients with rotator cuff tendinitis. J Rheumatol. 1990; 17:1207-1210.
7. Darlington LG, Coomes EN. The effects of local steroid injection for supraspinatus tears. Rheumatol Rehab. 1977; 16:172-179.
8. Hollingworth GR, Ellis RM, Hattersley TS. Comparison of injection techniques for shoulder pain: results of a double blind, randomized study. Br Med J. 1983; 287:1339-1341.
9. White RH, Paull DM, Fleming KW. Rotator cuff tendinitis: comparison of subacromial injection of long acting corticosteroid versus oral indomethacin therapy. J Rheumatol. 1986; 13:608-613.
10. Withrington RH, Girgis FL, Seifert MH. A placebo-controlled trial of steroid injections in the treatment of supraspinatus tendonitis. Scand J Rheumatol. 1985; 14:76-78.
11. Downing DS, Weinstein A. Ultrasound therapy of subacromial bursitis. A double blind trial. Phys Ther. 1986; 66:194-9.
12. Kennedy JC, Willis RB. The effects of local steroid injections on tendons: a biomechanical and microscopic correlative study. Am J Sport Med. 1976; 4:11-21.
13. Rocks JA. Intrinsic shoulder pain syndrome: rationale for heating and cooling in treatment. Phys Ther. 1979; 59:153-9.
14. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. Clin Orthop Relat Res. 1987; 214:160-4.
15. Cummins CA, Sasso LM, Nicholson D. Impingement syndrome: temporal outcomes of nonoperative treatment. J Shoulder Elbow Surg. 2009; 18:172-7.
16. Fongemie AE, Buss DD, Rolnick SJ (1998) Management of shoulder impingement syndrome and rotator cuff tears. Am Fam Physician. 1998; 57:667-674. 680-682.
17. Johansson K, Oberg B, Adolfsson L, Foldevi M. A combination of systematic review and clinicians' beliefs in interventions for subacromial pain. Br J Gen Pract 52:145–152.
18. Tallia AF, Cardone DA (2003) Diagnostic and therapeutic injection of the shoulder region. Am Fam Physician. 2003; 67:1271-1278.
19. Paavola M, Kannus P, Janvinen TA, Jarvinen TL, Jozsa L, Jarvinen M. Treatment of tendon disorders. Is there a role for corticosteroid injection? Foot Ankle Clin. 2002; 7:501-513.
20. Green S, Buchbinder R, Glazier R, Forbes A. Systematic review of randomised controlled trials of interventions for painful shoulder. BMJ, 1998; 316:354-360.