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Comparison of results of subacromial decompression versus conservative management in Subacromial impingement syndrome: A prospective study

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Abstract

Subacromial impingement syndrome (SAIS) represents a spectrum of pathology ranging from sub acromial bursitis to rotator cuff tendinopathy and full-thickness rotator cuff tears. Diagnosis is mostly clinically, however advance in imaging modalities have enabled clinician to have an increased understanding of pathological process. Conservative management which includes NSAIDS, physiotherapy, corticosteroid injections and platelet rich plasma injections are the initial treatment. But due to recurrence and no long term benefits in patient underwent conservative management, sub acromial decompression technique is rising trend in the last decade. There are studies which supports that sub acromial decompression gives better results not only in short term but also long term functional satisfaction, less recurrence rates and disability is less. So in this prospective study we have compared the results of sub acromial decompression with those who received conservative modality of treatment.

Keywords: subacromial impingement syndrome, subacromial bursitis, shoulder pain, rotator cuff tendinopathy, subacromial decompression

Introduction

Subacromial impingement syndrome (SAIS) is the most common disorder of shoulder for 44–65% of all complaints of shoulder pain during a physician's office visit ^[1]. Meyer was the first one to define impingement syndrome ^[2]. Sub acromial space pathologies include partial thickness rotator cuff tears, rotator cuff tendinosis, calcific tendinitis, and subacromial bursitis which contribute to impingement. Functional loss and disability are the most common consequence of impingement ^[3]. Sub acromial space is defined by the humeral head inferiorly, the anterior edge and under surface of the anterior third of the acromion, coracoacromial ligament and the acromioclavicular joint superiorly. The height of space between acromion and humeral head ranges from 1.0 to 1.5 centimeters Interposed between these two osseous structures are the rotator cuff tendons, the long head of the biceps tendon, the bursa, and the coracoacromial ligament ^[4]. Neer described three stages of impingement ^[5]. Most of the patients with subacromial pain are treated with, and will respond to, non-operative treatment alone ^[6]. surgical intervention is often used as an early treatment choice or in recalcitrant cases. Patients generally respond to conservative treatment including physical therapy, activity modification, non-steroid anti-inflammatory drugs (NSAID), and subacromial injection of steroids ^[7-11]. Conservative treatment reduces subacromial inflammation and pain and enables healing of the rotator cuff and functional improvement. It should be tried for at least 6 months although there is no consensus. Platelet-rich plasma (PRP) injection stimulates natural healing through growth factors in the platelets. PRP accelerates the physiological healing process, provides support for the connection of cells, reduces pain, and has an anti-inflammatory effect ^[12-14]. Brox *et al.* compared supervised exercise with surgery in patients with impingement syndrome and found no statistical difference between the two treatments at 2.5 years ^[15]. There are many other studies showing surgical treatment has not been conclusively shown to be much superior to conservative treatment ^[15-17]. But arthroscopic acromioplasty is still a popular procedure with a rising incidence over the last decade ^[18-19]. They states that the recurrence is less with subacromial decompression and long term functional outcome is good. So in our

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study we have tried to compare the arthroscopic decompression of sub acromial impingement with conservative treatment.

Material and Methods

This was a prospective randomized control trial. The proposed study had been carried out in the Department of Orthopaedics, CIO, Vardhman Mahavir Medical College and Hospital, New Delhi. The study was conducted over a period of one year and six months from October 2017 to March 2019. We have taken 76 patients with clinic radiological evidences of degenerative rotator cuff impingement syndrome with both arthroscopic subacromial decompression and non surgical treatment. All had pain in the mid-arc of abduction and a positive Hawkins test. Every patient had ultrasound or MRI scans of the shoulder to exclude rotator cuff tears and plain radiographs. Radiological assessment was done using X ray in anteroposterior position in neutral rotation and 90° internal rotation and supraspinatus outlet views.

MRI was done in order to assess any intra articular pathology associated with rotator cuff injury. Diagnosis for Impingement syndrome was made by clinically or either MRI or Diagnostic Arthroscopy. Implants were used from similar providers and all surgeries were performed by same surgeon. A follow up was done on post Op week 1, week 2, 2 months, 3 months and 6 months. Post operative assessment was performed using the rating scale of the University of California Los Angeles (UCLA) and the shoulder index of the American Shoulder and Elbow Surgeons (ASES). Pain was assessed using Visual Analogue Scale.

Inclusion Criteria

Clinical symptoms of shoulder impingement syndrome

A positive Neer's test

Symptom duration of at least three months

Age between 18 and 60 years

No previous operations on shoulder region

Willingness and capacity to comply with the treatment protocol and follow-up visits

Exclusion Criteria

Osteoarthritis

Irreparable tear

Signs of glenohumeral instability

Peri arthritis shoulder /frozen shoulder

Patients having repair of rotator cuff tears

Cervical root syndrome

Rotator cuff rupture

Result and Observation

The study was conducted at Central Institute of Orthopaedics (CIO), Vardhaman Mahavir Medical College and Safdarjung Hospital, New Delhi during the period of October'17 – March'19. We enrolled patients for our study with impingement syndrome which were duly evaluated and 38 patients were randomly distributed in each group for conservative and subacromial decompression.

The patients were followed up for a period of minimum 6 months. There were few drop outs from follow up and 70 out of 76 patients attended OPD for follow up. At each visit, patients were evaluated for their functional outcome, daily activities with any associated complications and thereby Performa filled for visual analogue score, ASES score, UCLA score and evaluated at the end of six months. Since the questionnaire was in English, the questions were translated to their mother tongue and the

response noted. About 73 % of the total patients were belonging to the age group of 40 to 60 years. 78% of the involved side was the right side. Men were more commonly affected than women accounting for 73 % of the patients. Pre op UCLA score in patients who were managed conservatively was 9.56 and that of patients who had undergone sub acromial decompression was 9.97. After treatment the improved UCLA score in conservative group was 28.36 compared to 30.9 in the operative group. The VAS score significantly improved from 7.85 to 1.64 and from 9.03 to 0.48 in the operative group. There was a significant improvement in the percentage of ASES score in operative patients that is 137% compared to 63% in the conservative group.

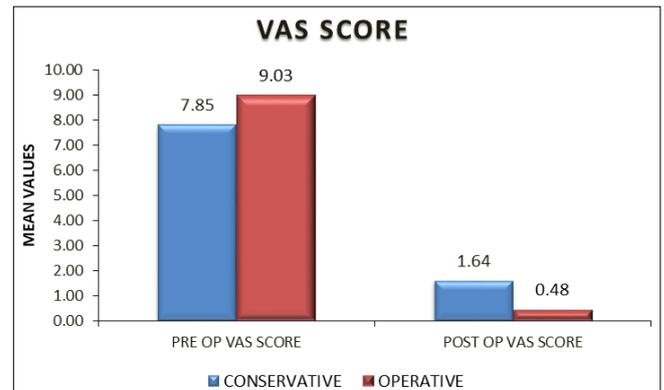


Fig 1a: Comparison of VAS score, UCLA score and ASES score

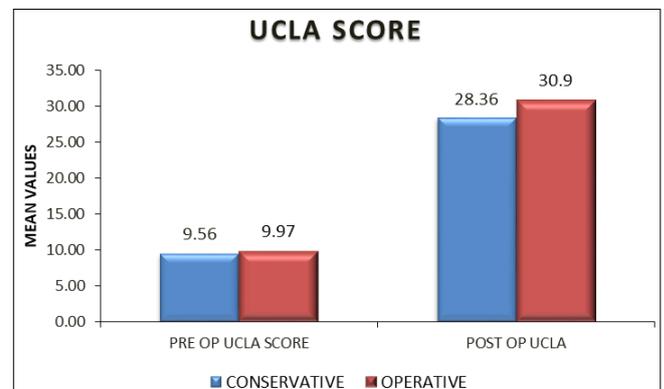


Fig 1b: Comparison of VAS score, UCLA score and ASES score

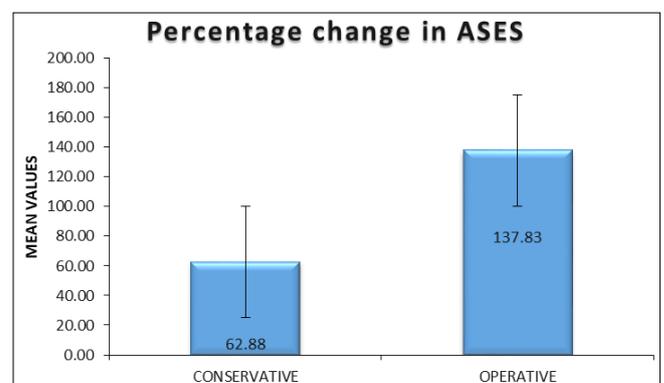


Fig 1c: Comparison of VAS score, UCLA score and ASES score

Discussion

Shoulder joint is known for its complexity of structures. A painful shoulder is a challenge in examination, diagnosis and intervention. The leading cause of shoulder pain are shoulder impingement and rotator cuff injuries^[20]. Shoulder impingement

syndrome was described in detail by Neer in 1972 as a painful condition in which the soft tissues of the subacromial space (bursa, rotator cuff tendons, biceps tendon) were chronically entrapped and compressed between the humeral head and the subacromial arch [22]. As in impingement syndrome the soft tissue is entrapped between the humeral head and sub acromial space, this condition is associated with progressive degenerative changes of the supraspinatus tendon in its hypovascular region and of the biceps tendon. The predisposing factors to this condition include the shape and orientation of the acromion, presence of osteophytes at the acromioclavicular joint, ossification of the coracoacromial ligament and the presence of os acromiale. Neer developed the anterior acromioplasty to eliminate the source of the impingement; a technique that has been widely used with favorable results [21]. In this technique, the undersurface of the acromion is rendered flat.

Subacromial decompression is quite a rewarding surgery in patients with main advantages of relief of pain and functional disability. It also provide you an opportunity to do a thorough diagnostic analysis of the shoulder joint. If any pathology is detected during the procedure likes of rotator cuff tear can be treated in one sitting. According to different authors, structures to be decompressed and extent of subacromial decompression varies. Primary impingement syndrome who have failed to conservative treatment in a type 2 patient, the treatment of choice is arthroscopic subacromial decompression. Failure to treat the associated rotator cuff pathology adequately during diagnosis and technical errors like under resection of acromion has contributed to poor result in arthroscopic subacromial decompression. So we have conducted a prospective study in which we analysed the functional outcome of arthroscopic subacromial decompression in primary impingement syndrome due to extrinsic mechanical causes alone such as shape and slope of acromion, acromioclavicular joint arthritis. The study was conducted prospectively at Safdarjung hospital in patients undergoing arthroscopic subacromial decompression during September 2014 to May 2016. Outdoor patient presenting to us with shoulder pain was evaluated for various pathologies. The patients who were having clinical findings of shoulder impingement were thus identified and evaluated further. Persistence of shoulder impingement symptoms and its symptoms in patients beyond a period of 6 weeks were diagnosed to have chronic shoulder impingement and included in the study on meeting the inclusion criteria. A study conducted by Dom K. *et al.* report a prospective five-year follow-up study of 52 patients who had arthroscopic subacromial decompression for advanced (stage II: type 1 and 2) rotator cuff disease [23] 45 (out of 52) patients showed a further progressing improvement and relief of symptoms from 6 months postoperatively to 5 years. In our study at 12 months post operatively, most of the cases achieved good to excellent results. In our study in total of 70 patients were taken, out of which 39 were treated conservatively and rest 31 operatively. In one more study conducted by Ellman H. *et al.*, they performed arthroscopic subacromial decompression on 65 patients who were evaluated for two to five years after surgery [24]. On the UCLA shoulder rating scale, about 89% of the cases in the study achieved a satisfactory result. In our study at 12 months post operatively, the pre op UCLA score was around 9 in both the groups and later was significantly improved to around 31 in the operative group in comparison to the conservative group. An acceptable objective UCLA shoulder rating >28 points was seen in maximum number of patients. 2 patients had complete tears < 1 cm obtained excellent results. Pre op ASES score was around 30 to 32 in

operative and conservative group. After one year post operative there was very good improvement in the ASES score to about 72 in the operative patient and 53 in conservatively managed cases. Pre operative VAS score was 7.8 and 9 in conservative and operative group respectively. After one year post operative the VAS score improved to .48 which was significant (p value <.0001). In our study, we have ruled out rotator cuff tear and isolated the cases of primary shoulder impingement due to extrinsic mechanical causes and most of the cases showed good to excellent results at 12 months postoperatively following arthroscopic subacromial decompression. Petre D. *et al.* reported a prospective study on 40 patients to investigate shoulder functions after arthroscopic subacromial decompression for advanced impingement syndrome (stage II) using a posterolateral and posteromedial portal. No complication was reported by the use of above mentioned portals. Patient satisfaction was reflected by the fact that they would have the same operation again, was 85%. [25] Early return to activity make arthroscopic techniques attractive, the long-term clinical outcomes of pain relief and function are comparable between open and arthroscopic techniques. There are few complications which include under resection with residual bone, over resection with resultant instability, infection, heterotopic ossification, fracture, suprascapular nerve injury, or neglected concomitant shoulder pathology. But none of these complications were reported in our series.

However, our study concludes that arthroscopic subacromial decompression provides good functional outcome in patients having primary shoulder impingement due to extrinsic mechanical causes such as shape and slope of acromion, acromioclavicular joint arthritis with minimal invasion. In our study recurrence were hardly seen in respect to conservative group. Long term functional outcome and less disability were quite remarkable findings in our study at 12 months post op in cases who underwent subacromial decompression.

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