



Original Research Article

To evaluate the role of intra articular autologous platelet rich plasma injection in the management of adhesive capsulitis of shoulder joint

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ABSTRACT

Adhesive capsulitis is defined as an idiopathic condition of shoulder joint, characterized by spontaneous onset of pain, stiffness & restriction of range of motion at the shoulder joint.¹ The prevalence found to be 3.06%. It has insidious onset with difficulty in sleeping on the affected side and in daily routine activities. Platelet rich plasma has been recently been an aspect of significant importance of interest²⁻⁵ in the orthopaedic community, to extract the facts regarding basic science of in vitro effects of PRP.⁶ As it is autologous content, so carries minimal risk for the patient.

In study, we evaluate the efficacy of single intra-articular platelet rich plasma injection in the patients with adhesive capsulitis.⁷ The study was conducted in thirty patients having established adhesive capsulitis of shoulder joint allocated for intra-articular injection of platelet rich plasma in the shoulder through anterior approach,

All the concerned patients assessed pre-operative and post-operative period by using DASH, VAS and ROM at regular intervals.

The study resulted in statistically significant improvement in pain in terms of DASH, VAS and functional ROM in patients with adhesive capsulitis.

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1. Introduction

Persistent shoulder pain is a very common problem in the community that often has multifactorial underlying pathologies and associated with high societal cost and patient burden. Spontaneous shoulder pain can result from bursitis, tendonitis, rotator cuff tear, A.C. impingement syndrome, Glenohumeral osteoarthritis and degenerative joint disease in which AC accounts for 6% of all shoulder pain.

Multiple intrinsic and extrinsic factors are thought to be responsible for disease progression.⁸ However, it is commonly believed that a combination of joint capsular contracture and fibrosis of rotator cuff interval, the subscapular & coracohumeral ligament lead to movement

restriction at Glenohumeral joint ; in multiple planes.

It is very essential to diagnose the shoulder pain in the community to decrease the diseaseburden. There is no any gold standard clinical diagnostic test⁹ available for AC, so AC is therefore a diagnosis of exclusion & must rely on accurate assessment of active and passive ROM. The globally accepted diagnostic criteria for AC is shoulder joint pain associated with restriction of active and passive movements of joint in at least two planes of joint range of motion; one being external rotation.

2. About Platelet Rich Plasma

For the management of adhesive capsulitis; the relatively emerging modality of treatment with single Intra articular platelet rich plasma injection is under study.^{10,11}

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PRP has been used successfully in different aspects of medical science, as in maxillofacial surgery, plantar fasciitis, keratitis, in plastic surgery and in multiple musculoskeletal conditions.^{12,13} Multiple basic science trials and publications regarding that are under study.

In this technique, PRP is used injecting directly into the shoulder joint. The defined benefit of PRP in AC is that it allows faster healing process by releasing several growth factors at the site.¹⁴ Components of PRP are believed to be Transforming Growth Factor - β , Basic Fibroblast Growth Factor, Platelet Derived Growth Factor, Vascular Endothelial Growth Factor, EGF and Connective Tissue Growth Factor.^{15–19}

3. Aims

1. Aims of the study are to evaluate the role of Intra-articular injection of, autologous platelet rich plasma in the management of adhesive capsulitis of shoulder joint.
2. Objectives are to analyse the outcomes of giving PRP in AC in terms of pain, ROM and activities of daily life using DASH and VAS scores.

4. Materials and Methods

The study is of prospective type; conducted in the department of Orthopaedics and Traumatology at MGMMC and MYH Indore; between September 2018 to August 2020.

The study is conducted after approval of ethics committee of aforementioned institute; over 30 cases with informed written consent taken from patients of adhesive capsulitis of shoulder joint.

The study is based purely on clinical observations so no specific investigations were done for outcome analysis.

The study was conducted for total duration of 18 months with minimum follow up of 6 months.

4.1. Inclusion criteria

Age of patient - > 18 years, both genders were taken, clinical signs and symptoms of adhesive capsulitis with pain and restricted range of motion at shoulder joint, patient with pain due to rotator cuff disorders, subjects with idiopathic adhesive capsulitis were taken, skeletally mature patient, patients who are willing to participate in study.

4.2. Exclusion criteria

Age of patient - less than 18 and more than 70 years, Morbid immunocompromised conditions. Patients with diagnosed RA or infective arthritis. Patients on long term steroid or immunosuppressant therapy. Post traumatic shoulder joint pain and stiffness including intra articular fractures. Patient with history of shoulder dislocation, thrombocytopenia, haemorrhagic disorders, Pt. On anticoagulant therapy,

infections & tumors, pregnancy, uncontrolled diabetes, patient not willing to participate.

4.3. Method

The prospective study is done at aforementioned centre; on patients arrived with shoulder pain. After establishment diagnosis of AC; patients were examined clinically & for RBS as well. Patients are classified as per inclusion and exclusion criteria of the study.

After all primary arrangements done and with precautions, patient will be taken for intraarticular PRP injection under aseptic conditions.

To obtain PRP we have taken 20 mL of autologous blood in ACD tube and allowed to centrifuge at 2400 RPM for 10 minutes. After separation of erythrocytes; PRP is poured into another tube and again centrifuged at 3600 RPM for 15 minutes, then the extracted PRP is used for injection.²⁰

Patients were followed up for 2 weeks, 4 weeks, 8 weeks and 6 months post injection. Scoring of results done using DASH, VAS and quantitative assessment of ROM.

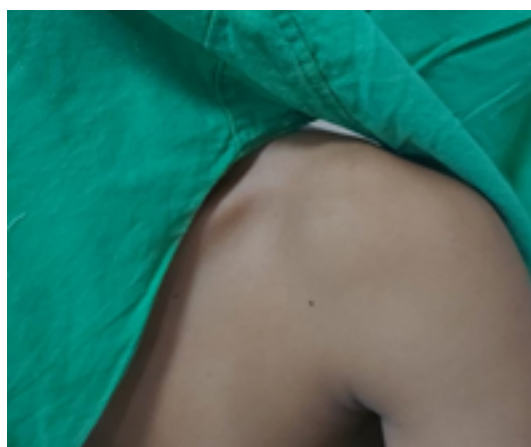


Fig. 1: Patient preparation inside OT

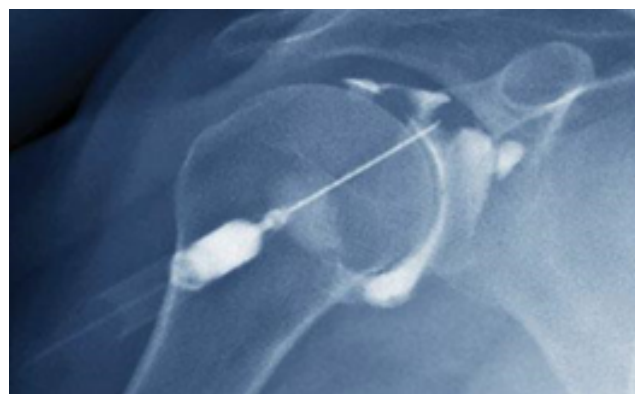


Fig. 2: PRP being injected in shoulder joint



Fig. 3: Pre injection clinical photos

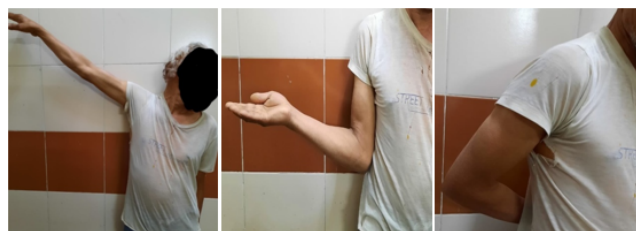


Fig. 4: Post injection clinical photos at 6 months

4.4. Statistical methods

The functional outcome in form of data were organised, tabulated and analysed using appropriate statistical means.

Quantitative data were expressed in terms of mean and qualitative data were expressed as percentage and frequency.

4.4.1. Assessment tools

1. DASH
2. VAS
3. Range of motion at shoulder joint. (External rotation, abduction & internal rotation).

5. Results and Discussion

1. The mean age found in our study was 50 years. This may be due to age related changes in collagen and proteoglycans that decrease the tension of joint cartilage and also because of the reduced supply of nutrients to the cartilage.
2. Preponderance of female patients has been consistently seen in all studies which may be related to less cartilage volume and greater cartilage wear, differences in mechanical alignment, anatomic differences, and genetic and hormonal issues.

3. In our study we found the right side to involved more than the left side showing preponderance of right side involvement.
4. There were no complications during the course of study.
5. The average duration of pain was 7.5 months.

5.1. ROM:(In Degree)

5.1.1. External rotation

The Mean external rotation increase from pre-procedure 12.3 to 41.03 degrees at 6 months which showed a significant increase in external rotation.

5.1.2. Abduction

The Mean abduction increase from pre-procedure 41 to 139 degrees at 6 months which showed excellent improvement in abduction.

5.1.3. Internal rotation

The Mean internal rotation increased from pre-procedure 13 to 38.67 degrees at 6 months which showed remarkable progress in internal rotation.

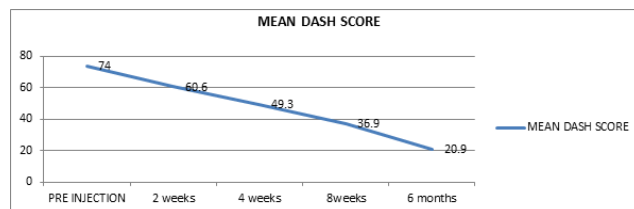


Fig. 5: Dash score

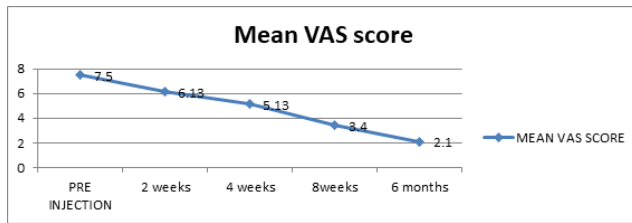


Fig. 6: VAS score

6. Summary and Conclusion

To summarize our prospective study of 30 cases of AC of shoulder that presented to the OPD or emergency to department of Orthopaedics and Traumatology, M.G.M Medical College and M.Y Hospital, Indore between Sept 2018 to August 2020 and treated with single intra-articular injection of PRP.

Post procedure, the patients were followed regularly for a period of 6 months. In our study:

The mean age found was 50 years, the incidence of AC of shoulder was higher in female patients as compared to male patients. Right side was more frequently involved compared to left. The rate of post injection complication is nil in this study probably due to autologous nature of PRP. The average duration of pain was 7.5 months. The mean external rotation increase from pre-procedure 12.3 to 41.03 degrees at 6 months which showed a significant increase in external rotation, the mean abduction increase from pre-procedure 41 to 139 degrees at 6 months which showed a significant increase in abduction. The mean internal rotation increased from pre-procedure 13 to 38.67 degrees at 6 months which showed a significant increase in internal rotation. In our study, Mean DASH Score decreased from pre-procedure 74 to 20.9 at 6 months which showed a significant decrease in DASH Score. PRP injections have shown effectiveness in providing pain relief in AC of shoulder joint patients. As a result total DASH score was significantly reduced at 6 months as compared to preprocedure and thus prove the effectiveness of the PRP therapy. In our study, a PRP injections have shown effectiveness in providing pain relief in AC of shoulder joint patients. As a result total VAS score was significantly reduced at 6 months as compared to preprocedure and thus prove the effectiveness of the PRP therapy.

Three out of thirty patients did not have significant improvement at 6 months, all of those were diabetic and their RBS levels were found to be raised during subsequent follow ups. Any other reason except this was not found regarding failure of this procedure.

The clinical utility of use of single intraarticular PRP injection in subjective pain relief after 6 months of injection was proved.

Use of single PRP injection in the treatment of AC of shoulder has an advantage of high safety, being a simple

procedure, taking only 30mins, financially at very low cost, requiring less surgical skill and hence a OPD/Minor procedure with negligible side effects and is more satisfying to the patient and helps treat unresponsive chronic pain and also delays progression of disease, PRP preparation demands careful blood withdrawal, centrifugation and isolation under strict aseptic precautions and through pre injection planning, PRP seems to be a well tolerated therapeutic application which has shown encouraging clinical results in patients with AC of shoulder joint.

This suggests that PRP may have the potential to heal at the level of degenerative tissue and may be primary non surgical treatment for AC of shoulder joint.

7. Source of Funding

None.

8. Conflict of Interest

The authors declare that there is no conflict of interest.

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p. 955–8.

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