

## Original Research

### Intra articular platelet rich plasma (PRP) injection versus hydrocortisone with local anesthetic injection in internal derangement of TMJ - A comparative analysis

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#### ABSTRACT:

**Background:** The management of internal derangement includes conservative approaches and surgical approaches if the former fails. The present study was conducted to compare Intra articular platelet rich plasma (PRP) injection and hydrocortisone with local anesthetic injection in internal derangement of TMJ. **Material & methods:** The study was conducted in the Deptt. of oral and Maxillofacial surgery Government Dental College, Srinagar from June 2019 to April 2022. PRP was used for Group A (60 joints of 30 patients), and hydrocortisone with local anesthetic was used for Group B (60 joints of 30 patients). Patients were assessed pre- and post-operatively at the intervals of 1<sup>st</sup> week and 3<sup>rd</sup> month for pain and maximal inter-incisal opening (MIO). The collected data were analyzed with IBM SPSS (Statistical Product and Service Solutions), India 23.0 version and p value 0.005 is considered as a significant level. **Results:** Pain was experienced by all patients in both the groups initially which markedly reduced in Group A at the interval of 1<sup>st</sup> week and 3<sup>rd</sup> month, whereas in Group B, the pain reduced but not as significant as Group A. MIO was equal for both the Groups A and B after 1<sup>st</sup> week and significantly increased after 3<sup>rd</sup> month in Group A. **Conclusion:** The present study concluded that pain was reduced significantly after 3<sup>rd</sup> month and MIO significantly increased after 3<sup>rd</sup> month with Intra articular platelet rich plasma (PRP) injection in comparison of hydrocortisone with local anesthetic injection in internal derangement of TMJ.

**Keywords:** Intra articular platelet rich plasma, hydrocortisone, internal derangement, TMJ.

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#### INTRODUCTION

Internal derangement of the temporomandibular joint (TMJ) is an abnormal relationship of the articular disc to the glenoid fossa, mandibular condyle, and articular eminence and may include a deformation, perforation, or displacement of the disc and/or posterior attachment of the disc.<sup>1</sup> Internal derangements of the TMJ include disc displacements with reduction (DDWR) or disc displacement without reduction (DDWOR), often responsible for joint sounds, pain, and discomfort in the TMJ area. Displacement of the disc can present displacements in any direction, but anterior disc displacement is most common. In nonreducing displacement, the posterior band is

positioned anteriorly to the condyle both with the mouth closed and opened.<sup>2</sup>

Primary goals of the treatment for TMD are to increase the range of motion and relieve the functional pain of the temporomandibular joint (TMJ). Corticosteroids have anti-inflammatory properties and it exerts its effect by inhibiting the prostaglandins synthesis which is an important mediator of inflammation, whereas platelet-rich plasma (PRP) is a concentrate of platelets and associated growth factors and has potential healing properties through the recruitment, proliferation, and differentiation of cells, and tissue remodeling.<sup>3-5</sup>

The present study was conducted to compare Intra articular platelet rich plasma (PRP) injection and

hydrocortisone with local anesthetic injection in internal derangement of TMJ.

**MATERIAL & METHODS**

The study was conducted in the Deptt. of oral and Maxillofacial surgery Government Dental College, Srinagar from June 2019 to April 2022. In the present study a total of 120 temporomandibular joints with internal derangement, were divided into two groups (Group A and Group B). Before the commencement of the study ethical clearance was taken from the Ethical Committee of the institute and written informed consent was obtained from the patients after explaining the procedure involved in the study. PRP was used for Group A (60 joints of 30 patients), and hydrocortisone with local anesthetic was used for Group B (60 joints of 30 patients). Both patient and operator were blinded to the contents of injections used in arthroscopy.

**INCLUSION CRITERIA**

Clinical diagnosis of anterior DDWOR of TMJ according to diagnostic criteria for TMDs for clinical and research application. Radiological diagnosis by magnetic resonance imaging, mandibular opening with assistance increased by 3 mm from unassisted opening, with a prior history of click. Contralateral movements <7 mm and/or uncorrected deviation to the ipsilateral side on opening, TMJ pain.

**EXCLUSION CRITERIA**

The presence of other disorders involving the TMJ (e.g. degenerative joint disease, or collagen vascular disease), history of major jaw trauma, dentofacial deformity, psychiatric illness, chronic headache.

**PREPARATION OF PLATELET-RICH PLASMA**

First, 5 ml blood was withdrawn from the patient. Then, blood was poured in a test-tube in which sodium citrate anticoagulant (0.5 ml) was already present. It was centrifuged at the rate of 2100 rpm for 15 min. Then, the plasma of the first harvest was fractionated using centrifugation at 3500 rpm for 10 min to collect the pellet. For each TMJ, 0.6 ml PRP was drawn into 2 ml syringes.

**OPERATIVE TECHNIQUE**

The temporomandibular region was prepared with antiseptic solution. The injection point was marked 10 mm forward from the tragus and 2 mm below the tragus-lateral canthus line. In one joint, 0.6 ml PRP was injected and in other joint, 1 ml local anesthetic with 0.5 ml hydrocortisone was injected using 27 gauge needle. During the procedure, the mouth of the patient should be wide open. After the injection, the patient was asked to do lateral and protrusive movements. Ice application was advised at site of injection for few minutes.

Patients were assessed pre- and post-operatively at the intervals of 1<sup>st</sup> week and 3<sup>rd</sup> month for pain and maximal inter-incisal opening (MIO). Pain intensity was assessed by visual analog scale (VAS). The collected data were analyzed with IBM SPSS (Statistical Product and Service Solutions), India 23.0 version and p value 0.005 is considered as a significant level.

**RESULTS**

In the present study a total of 120 temporomandibular joints with internal derangement, were divided into two groups (Group A and Group B). PRP was used for Group A (60 joints of 30 patients), and hydrocortisone with local anesthetic was used for Group B (60 joints of 30 patients).

**Table 1: Visual analogue scale difference between Group A and Group B**

	VAS Pre injection	VAS first week	VAS third month
Group A	3.5	2	0.3
Group B	3.3	2.5	1

Table 1 shows values of VAS Scale, pain was experienced by all patients in both the groups initially which markedly reduced in Group A at the interval of 1<sup>st</sup> week and 3<sup>rd</sup> month, whereas in Group B, the pain reduced but not as significant as Group A.

**Table 2: Difference in maximal inter-incisal opening between Group A and Group B**

	MIO Pre injection (mm)	MIO first week (mm)	MIO third month (mm)
Group A	25	28	35
Group B	24	28	29

Table 2 reveals MIO was equal for both the Groups A and B after 1<sup>st</sup> week and significantly increased after 3<sup>rd</sup> month in Group A.

**DISCUSSION**

The TMJ is described as one of the most used joints in the body. The TMJ is a compound articulation formed

from the articular surfaces of the temporal bone and the mandibular condyle. Both surfaces are covered by dense articular fibrocartilage. Each condyle articulates with a large surface area of temporal bone consisting of the articular fossa, articular eminence, and preglenoid plane. The TMJ functions uniquely in that the condyle both rotates within the fossa and

translates anteriorly along the articular eminence. Because of the condyle's ability to translate, the mandible can have a much higher maximal incisal opening than would be possible with rotation alone. The joint is thus referred to as "ginglymodiarthrodial": A combination of the terms ginglymoid (rotation) and arthrodial (translation).<sup>6</sup>

In symptomatic DDWOR, patients can experience pain and reduced jaw mobility,<sup>7</sup> thus the arthrocentesis being an effective treatment option for DDWOR when conservative methods are no longer efficient.<sup>8</sup> Pain was experienced by all patients in both the groups initially which markedly reduced in Group A at the interval of 1<sup>st</sup> week and 3<sup>rd</sup> month, whereas in Group B, the pain reduced but not as significant as Group A. MIO was equal for both the Groups A and B after 1<sup>st</sup> week and significantly increased after 3<sup>rd</sup> month in Group A.

Gupta S et al (2018) assessed whether intra articular injection of PRP in TMJ minimizes the symptoms of internal derangements as compared to injection of hydrocortisone with local anesthetic. In the group of PRP injection, pain was markedly reduced than the group of hydrocortisone with local anesthetic; mouth opening was increased similarly in both groups and TMJ sound was experienced lesser in patients who received PRP.<sup>9</sup>

Ramakrishnan DS et al (2022) compared the efficacy of platelet-rich plasma (PRP) for the management of internal derangement of temporomandibular joint (TMJ). The mean age was 33 years, with female predominance. The statistical significant differences ( $P < 0.05$ ) in pain and MIO between the 3 groups at the end of 3<sup>rd</sup> week, 4<sup>th</sup> week, and 3<sup>rd</sup> month postoperatively are seen in PRP group comparative to other groups.<sup>10</sup>

## CONCLUSION

The present study concluded that pain was reduced significantly after 3<sup>rd</sup> month and MIO significantly increased after 3<sup>rd</sup> month with Intra articular platelet rich plasma (PRP) injection in comparison of hydrocortisone with local anaesthetic injection in internal derangement of TMJ.

## REFERENCES

1. Laskin DM, Greene CS, Hylander WL, editors. Temporomandibular disorders: an evidence-based approach to diagnosis and treatment. Quintessence Publishing Company; 2006.
2. Al-Delayme RM, Alnuamy SH, Hamid FT, Azzamily TJ, Ismaeel SA, Sammir R, *et al.* The efficacy of platelets rich plasma injection in the superior joint space of the tempromandibular joint guided by ultra sound in patients with non-reducing disk displacement. *J Maxillofac Oral Surg* 2017;16:43-7
3. Anitua E, Andia I, Ardanza B, Nurden P, Nurden T. Autologous platelets as a source of proteins for healing and tissue regeneration. *ThrombHaemost.* 2004;91:4-15.
4. Frank C, McDonald D, Shrive N. Collagen fibril diameters in the rabbit medial collateral ligament scar: A longer term assessment. *Connect Tissue Res.* 1997;36:261-9.
5. Marx RE. Platelet-rich plasma: Evidence to support its use. *J Oral Maxillofac Surg.* 2004;62:489-96.
6. Herb K, Cho S, Stiles MA. Temporomandibular joint pain and dysfunction. *Curr Pain Headache Rep.* 2006;10:408-14.
7. Kurita K, Westesson PL, Yuasa H, Toyama M, Machida J, Ogi N. Natural course of untreated symptomatic temporomandibular joint disc displacement without reduction. *J Dent Res* 1998;77:361-5.
8. Tatli U, Benlidayi ME, Ekren O, Salimov F. Comparison of the effectiveness of three different treatment methods for temporomandibular joint disc displacement without reduction. *Int J Oral MaxillofacSurg* 2017;46:603-9.
9. Gupta S, Sharma AK, Purohit J, Goyal R, Malviya Y, Jain S. Comparison between intra-articular platelet-rich plasma injection versus hydrocortisone with local anesthetic injections in temporomandibular disorders: A double-blind study. *National Journal of Maxillofacial Surgery.* 2018 Jul;9(2):205.
10. Ramakrishnan DS, Kandamani J, Nathan KS. Comparison of intraarticular injection of platelet-rich plasma following arthrocentesis, with sodium hyaluronate and conventional arthrocentesis for management of internal derangement of temporomandibular joint. *National Journal of Maxillofacial Surgery.* 2022 May 1;13(2):254.