

A multidisciplinary approach for the management of temporomandibular joint disc displacement without reduction

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Abstract

The temporomandibular joint (TMJ) is one of the primary components of the complex masticatory system. Any disturbance in the joint due to congenital or acquired causes such as trauma, pathology, or functional disturbance affects the masticatory system. This case report highlights the management of condylar hypoplasia due to trauma by forceps delivery which led to TMJ dysfunction and chronic disc displacement without reduction. A combination of stabilization appliance and arthrocentesis using platelet-rich plasma along with patient education has been proved effective for the conservative management of patients with chronic disc displacement and TMJ dysfunction.

Keywords: Arthrocentesis, condylar hypoplasia, platelet-rich plasma, stabilization appliance, temporomandibular joint disc displacement without reduction

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INTRODUCTION

Temporomandibular disorder (TMD) is any disorder that affects or is affected by deformity, disease, misalignment, or dysfunction of the temporomandibular articulation. This includes occlusal deflection of the temporomandibular joint (TMJ) and associated responses in musculature.^[1] The incidence of disc displacement without reduction (DDwoR) has been estimated to be 2%–8% among the TMD patients.^[2]

DDwoR could be acute or chronic and is frequently addressed as “Closed lock,”^[3] the features being an inability to open the mouth wide to the normal range

(45–50 mm) and difficulty while performing excursive movements. Chronic disc displacement should be managed conservatively by the supportive therapy and stabilization appliance. Surgical intervention is advised in case of failure to resolve pain through supportive therapy.

CASE REPORT

A 22-year-old female reported to the department of prosthodontics with the chief complaint of pain in the right ear region while chewing all kinds of food for 2.5 years. The patient had undergone extraction of all four third molars due to the same before 1.5 years, but the pain did

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not resolve. She had no significant medical history and family history but reported that she had been delivered through forceps delivery method. The preextraction record in the form of an orthopantomogram (OPG) was available [Figure 1]. The nature of pain was dull, continuous, located in the right TMJ region, and aggravated on chewing both soft and hard food.

On extraoral cranial nerve examination, there was a pain while clenching the teeth (testing motor component of the trigeminal nerve). The interincisal distance was 32 mm. Muscle examination was done^[4] [Table 1]. TMJ examination revealed deviation of the mandible toward the left side while opening. There was a pain during left lateral movement and protrusive movement. On palpation, both the TMJs were tender. Clicking was present in the right TMJ when the patient tried to open the mouth wide. The load test revealed pain on the initial gentle loading.

Intraoral examination revealed crowding of 31, 32, 33, 41, 42, and 43 [Figures 2 and 3]. Enamel wear facet was present in 47. The occlusion was anterior guided Angle's Class I malocclusion with the interferences at distobuccal cusp of 17 and 32.

The investigations were carried out to exclude any systemic disease affecting the TMJ. OPG and computed tomography scan of the right and left TMJ confirmed for condylar hypoplasia and early arthritic changes [Figures 4 and 5]. Magnetic resonance imaging of the patient confirmed anterolateral disc dislocation without reduction.

The treatment planning included patient education and motivation, supportive therapy, stabilization appliance, and arthrocentesis of TMJ followed by an orthodontic correction.

The following steps were used to fabricate a stabilization appliance:

1. Diagnostic casts were obtained, and a 2-mm thermoplastic sheet was vacuum formed on it [Figure 6]

Table 1: Severity of muscle tenderness at the 1st week and 6th week

Muscle examination	Grade of pain	
	1 st week	6 th week
Temporalis	0	0
Masseter	1	0
Sternocleidomastoid	0	0
Posterior cervical muscles	0	0
Inferior lateral pterygoid	2	0
Superior lateral pterygoid	2	0
Medial pterygoid	2	0

Moody et al.^[4]

2. The patient was guided in centric relation, and anterior centric indentations were obtained by adding acrylic on the palatal aspect of the upper anterior teeth such as to increase the inter-occlusal distance by 4–6 mm so that it produces 1–1.5 mm space in the molar region [Figure 7]
3. Now, clear acrylic was added in the posterior region while the patient is asked to close on the anterior centric indentations [Figure 8]



Figure 1: Orthopantomogram of the patient before extraction of the third molars showing condylar hypoplasia and early arthritic changes



Figure 2: Pretreatment view of the maxillary arch



Figure 3: Pretreatment view of the mandibular arch



Figure 4: Orthopantomogram after extraction of the third molars showing persistent arthritic changes



Figure 5: Computed tomography scan investigation before the treatment



Figure 6: 2-mm thermoplastic sheet vacuum formed on the maxillary cast



Figure 7: Anterior centric indentations obtained on the vacuum formed sheet at an increased interocclusal distance



Figure 8: Addition of acrylic in the posterior region



Figure 9: Marking the incisal edges and buccal cusp tips for flattening the rest of the appliance

4. At this step, we need to mark all the centric indentations on buccal cusp tips of the posterior teeth and incisal edge of the anterior teeth to flatten the rest of the appliance [Figure 9]
5. The appliance was then inserted in the patient's mouth and was checked for the centric and eccentric path.

The eccentric path should exclude any other path than the canine. In the present case, as 32 was an interference that is to be corrected orthodontically, the appliance had left-sided eccentric path from 32 [Figure 10]

6. The final insertion was done, and the patient was asked to wear the appliance at least for 6 weeks [Figures 11-14].



Figure 10: Centric and eccentric path of the mutually protected occlusal scheme

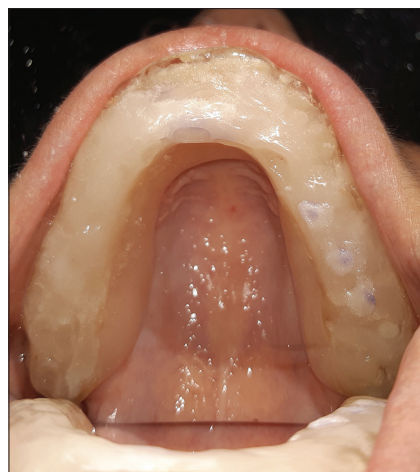


Figure 11: Stabilization appliance – Occlusal view



Figure 12: Stabilization appliance – Frontal view



Figure 13: Stabilization appliance – Right lateral view: Note the contact of the incisal edge of the anterior teeth and buccal cusp tip of the posterior teeth in centric relation

Postinsertion instructions were to wear the appliance throughout the day and night excluding the mealtimes and teethbrushing.^[5] In case of exaggeration of symptoms, the patient must report back. Examination was done on follow-up at each week until 6 weeks.

At the end of 2 weeks, arthrocentesis of both the TM joint spaces by irrigating with 50 ml of ringer lactate solution and then treating by 0.6 ml of platelet-rich plasma (PRP) was performed at the department of oral and maxillofacial surgery.

At the end of 6 weeks, the interincisal opening was 40 mm. Pain while chewing had reduced significantly, and clicking of the right TMJ was absent. On examination of muscles and TMJ, the pain had subsided [Table 1]. The patient was then sent for orthodontic correction of her existing malocclusion.

DISCUSSION

TMJ disc displacements are the most common TMJ pathologies in the community.^[2] In DDwoR, there could

be an acute phase or chronic phase. In the acute phase, there could be jaw locks or catches and interferences in jaw opening, but it improves in the chronic phase. The relationship between recent-onset DDwoR and degenerative TMJ changes in adolescents and young adults has been explored. Osteoarthritis (OA) alterations were observed in 59.3% of joints with DDwoR.^[6]

The treatment of DDwoR is mainly by patient education, self-motivation, and jaw exercises. Mandibular manipulation can be done in the acute phase. The chronic phase is managed by splint therapy and arthrocentesis. Correction of any occlusal discrepancy plays a vital role in the management of such dysfunction.

Linde *et al.*^[7] performed a 6-week study on patients with DDwoR to compare the effect of transcutaneous electrical nerve stimulation (TENS) versus occlusal splint therapy and concluded that flat occlusal splint therapy is better



Figure 14: Stabilisation appliance – Left lateral view

than TENS and pain reduction was 50% more in the splint group.

Minakuchi *et al.*^[8] performed a randomized controlled evaluation of nonsurgical treatments for DDwoR and suggested that occlusal splint therapy and jaw mobilization plus self-care were significantly effective than nonsteroidal anti-inflammatory drugs plus self-care over a period of 8 weeks.

Schmitter *et al.*^[9] performed a randomized control trial to study conservative therapy for DDwoR using stabilization splint and distraction splint. Their study concluded that improvement in mouth opening was found in both the groups. However, stabilization splint had significantly more successful outcome in relieving pain during function than distraction splint.

Lin *et al.*^[10] performed a retrospective matched cohort study to compare the effect of arthrocentesis plus PRP and PRP alone for treating TMJ OA and studied that PRP significantly helps in the healing process as it is enriched with growth factors when used between the range of 0.5 and 2 ml in high concentration and high purity. Higher efficacy is obtained in relieving other symptoms such as TMD-associated headache, jaw range of motion <6 mm, myofascial pain with a referral, and pain when chewing most foods when used along with arthrocentesis.

In the present study, we have used a combination of conservative therapies that have been proved successful to relieve the symptoms of DDwoR beginning from patient education and self-regulation, stabilization splint, and arthrocentesis along with PRP injection which yielded a successful outcome by improvement in both mouth opening and pain relief during function on a follow-up period of 10 months.

CONCLUSION

The effective management of TMJ DDwoR demands a multidisciplinary approach that must begin with conservative management by physiotherapy, jaw manipulation, occlusal appliance, correction of occlusion, arthrocentesis, and supportive therapy along with patient's self-regulation. Any aggressive intervention should be carefully planned due to the lack of long-term successful outcome in such cases.

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Conflicts of interest

There are no conflicts of interest.

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