

Case Report



Atypical Presentation of Disc Displacement Without Reduction of the Temporomandibular Joint with Increased Mouth Opening Treated by a Minimally Invasive Approach

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Abstract

Disc Displacement without Reduction (DDwoR) is a temporomandibular joint (TMJ) disorder typically associated with limited mouth opening due to obstruction from a non-reducing anteriorly displaced disc. However, in rare instances, patients may maintain normal or increased mandibular mobility due to adaptive changes in the retrodiscal tissues. Minimally invasive treatment approach is extremely helpful in such cases when all conservative protocol fails.

Key words: Temporomandibular joint, Disc displacement, Single puncture arthrocentesis, Joint clicking, TMJ dysfunction, Mouth opening, Minimally invasive.

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Introduction

Temporomandibular joint (TMJ) disorders include a wide range of conditions, and among them, disc displacement without reduction (DDwoR) is fairly common, affecting about 35.7% of cases.¹ In DDwoR, the articular disc remains stuck in a forward (anterior) position relative to the mandibular condyle, whether the mouth is open or closed. This often leads to symptoms like joint pain and difficulty opening the mouth.²⁻⁴ In most cases, treatment begins with conservative options-such as medications, physiotherapy, and occlusal splints-which aim to reduce pain and improve function.⁵ However, when these approaches are not enough to relieve symptoms, more advanced treatments may be needed.⁶ Sometimes, when a patient visits with symptoms, then a minimally invasive approach is more helpful.

Case Presentation

A 17-year-old female presented with complaints of a persistent clicking sound in the left TMJ for the past two years. The symptom was accompanied by mild, intermittent pain during chewing and jaw movements. There was no history of direct trauma, systemic joint disease, or parafunctional habits such as bruxism. On clinical examination, the Maximum mouth opening was 52 mm. An audible and palpable opening click sound has been present on the left side for the last 2 years. Mild tenderness over the left preauricular region. There was a deviation of the jaw to the other side during maximum opening of the mouth, so the clinical diagnosis is disc displacement without reduction without limited opening. A panoramic radiograph revealed the impaction of all four third molars. No significant degenerative or osseous pathology was detected in the TMJ region. The joint space appeared normal and the condylar morphology was in normal shape.

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Notably, the patient presented with a wide mouth opening, suggesting adaptive changes in the retrodiscal tissues that permitted normal mandibular excursion despite persistent disc displacement. The treatment plan includes a minimally invasive procedure, arthrocentesis of the left TMJ, steroid lavage and extraction of all 4 third molars under general anaesthesia.

Surgical steps: The patient was positioned at a 45° angle with the head turned to the right. The left external auditory meatus was occluded with cotton. Single puncture arthrocentesis (SPA) is planned for the patient (Figure 1). The left side preauricular area was prepared using an antiseptic solution. Holm-lund-Hellsing (HH) line: Point A: 10 mm anterior and 2 mm inferior to the mid-tragus. Point B: 20 mm anterior and 10 mm inferior along the canthotragal line is drawn. A double-lumen, single-barrel needle was inserted into the superior joint space. At first, lavage was performed using 200 ml of Ringer's lactate solution. The whitish fibrous band was broken down to tiny pieces with the hydrostatic pressure of the lavage solution and comes out through the other lumen. followed by 1 ampoule of hydrocortisone is injected into the joint cavity, and the steroid solution comes out through the lumen. All third molars were extracted with the transalveolar extraction technique.



Figure 1: Arthrocentesis with single puncture technique (SPA)

The procedure was uneventful, with no intraoperative or postoperative complications. The patient was discharged with the following prescriptions and instructions.

Medications: Antibiotics, NSAIDs, muscle relaxants. Cefixime 200 mg 12 hourly, metronidazole 500 mg 8 hourly, for 7 days, tolperisone hydrochloride 50 mg 12 hourly, ibuprofen 300 mg 8

hourly, for 14 days were prescribed for the patient.

The patient was advised to avoid opening her mouth beyond 35 mm for 2 weeks and refrain from exaggerated jaw movements (yawning, wide chewing). After 2 days, her MO is 30 mm, and after 1 week, MO is 38 mm, after 4 months, MO is 55 mm (Table I).

Table I: Patient's maximal mouth opening and Visual Analogue Scale (VAS) scores.

Follow - up Period	Maximal Mouth Opening (mm)	Pain Score (VAS 0 -10)
At presentation	62	8
On the day of the procedure	50	8
2 nd post-procedural day (with physical therapy)	30	5
1 week post-procedural (with physical therapy)	38	1
4 months post-procedural	55	0

VAS = Visual Analogue Scale.

Discussion

In patients with internal derangement of TMJ, the normal joint dynamics are altered. Internal derangement may be defined as any interference with smooth joint movement due to the altered joint morphology. In a normal TMJ, the disc is positioned over the condylar head with the posterior band situated in the 12 o'clock (superior to the condyle) position and the intermediate zone Joint situated in the 1 o'clock (superior-anterior to the condyle) position. On opening the disc- condyle complex translates in a forward direction. Although the condyle also rotates forward, the disc relatively rotates in a posterior direction over the condyle (Figure 2).

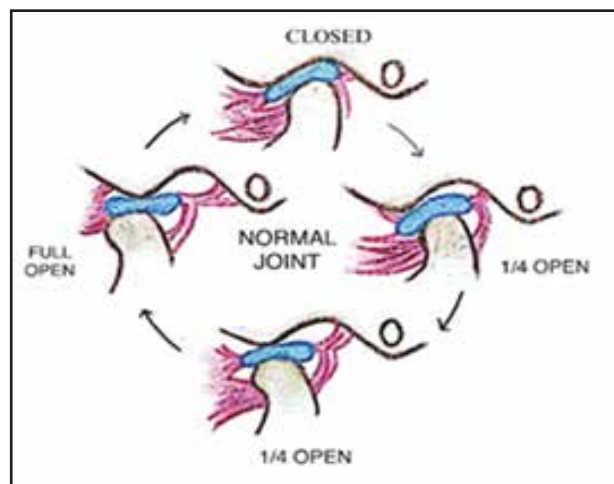


Figure 2: Normal joint movement (Disc - condyle complex)

A disc derangement is defined as a malpositioning of the articular disc relative to the condyle and eminence. Disc derangement may be with reduction or without reduction of the displaced disc.⁷

Disc derangement with reduction is typically defined as a condition in which the articular disc of the TMJ is (most often anteriorly) displaced while the mouth is closed and the teeth are together in maximal occlusion. On opening, the condyle pushes against the posterior band of the disc until the condyle is able to slide or snap under the posterior band of the disc, and the disc reduces to its position on top of the condyle. Overcoming the thick posterior band of the disc is believed to be responsible for the clicking or popping sound. On closing the mouth, the disc stays behind and slips off the condyle, which may be accompanied by a clicking sound. Typically, the opening click occurs later during the opening movement, whereas the closing click often occurs close to maximal occlusion, without any pain (Figure 3).

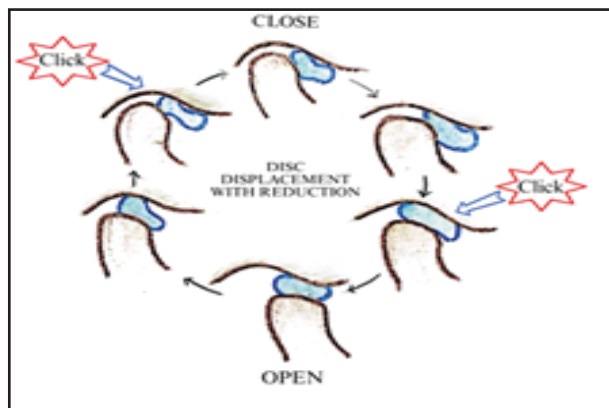


Figure 3: Disc displacement with reduction

Disc derangement without reduction is defined as a condition in which the condyle is unable to slide or snap back underneath the disc. The (anteriorly) displaced disc thus does not reduce to its position on top of the condyle during the opening movement. The disc obstructs further translation of the condyle and consequently, the opening and contralateral movements are impaired (Figure 4).

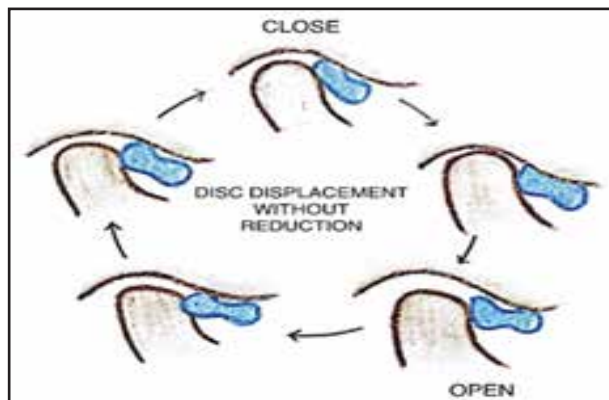


Figure 4: Disc displacement without reduction

Disc Displacement without Reduction (DDwoR) typically presents with pain and restricted mouth opening, often limited to less than 30 mm. However, in the present case, the patient exhibited increased mouth opening, which may be attributed to adaptive changes in the retrodiscal tissue that compensated for the non-functional disc. This adaptive mechanism likely explains the patient's preserved joint mobility despite chronic disc displacement.⁸

Arthrocentesis of the TMJ represents a form of minimally invasive surgical treatment in patients suffering from internal derangement of the TMJ. The chief role of arthrocentesis lies in the release of adhesions and washing out of inflammatory mediators. In this case, 100 mg hydrocortisone sodium succinate was injected into the joint space for its anti-inflammatory benefits, both for the pathologic condition and to reduce post-procedural inflammation.⁹

In a comparative study on the improvement of pain and function after arthroscopy and arthrocentesis of the TMJ, Goudot et al.¹⁰ concluded that both arthroscopy and lavage are useful in improving function and diminishing pain. Arthroscopy shows better results for functional treatment, whereas arthrocentesis and arthroscopy show similar results in pain control. In this case, arthrocentesis was done using a single-puncture technique with a double-lumen single-barrel needle, which is a new device. It can be utilized to perform arthrocentesis in a precise manner and cause minimal trauma to the investing tissue. This novel technical modification offers better flow characteristics of the irrigant, thereby ensuring effective lavage of the joint.¹¹

Conclusion

The patients who are unresponsive to conservative therapies, arthrocentesis is generally suggested for them. However, it has recently been proposed as a first-line treatment in disc displacement without reduction. It can be performed under local anaesthesia with or without sedation. Clearing off the joint from tissue debris, blood, and inflammatory mediators is the main objective. The fluid pressure which is inserted releases the intracapsular adhesion, thereby aiding translation of the disc and the condyle in normal or at least near-normal synchrony.

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