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**Case Report**

# Use of Mitek® Mini Anchor for Disc Repositioning in Internal Derangement of Temporomandibular Joint – A Case Report

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**Abstract**

Internal derangement (ID) of the temporomandibular joint (TMJ) is one of the common forms of temporomandibular disorders (TMD) wherein the disc is abnormally positioned in relation to the mandibular condyle and articulating surface of the temporal bone. Disc repositioning is considered ideal in patients with displaced but salvageable disc. Conventional method of disc repositioning involves suturing the disc to adjacent soft tissues which is associated with relapse of clinical symptoms. To overcome this drawback, Cottrell & Wolford proposed the use of rigid anchoring devices for stable results after disc repositioning. This case report demonstrates the effective use of the same, in a patient with ID, who exhibited anterior disc displacement without reduction.

*Keywords:* *Internal Derangement, Mini Anchor, Temporomandibular Joint, Mouth Opening, Articular Disc*

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## INTRODUCTION

Internal derangement (ID) of the temporomandibular joint (TMJ) is one of the common forms of temporomandibular disorders (TMD) wherein the disc is abnormally positioned in relation to the mandibular condyle and articulating surface of the temporal bone [1]. The etiological factors commonly cited are micro-trauma, macro-trauma or systemic arthropathy. A displaced disc can lead to inflammatory reactions in the joint with resultant morphological and functional changes such as (1) osteoarthritis, (2) degenerative changes in disc and (3) unfavorable condylar remodeling, causing reduction in condylar height as well as facial asymmetry [2]. The condition is characterized by the presence of painful joint which debilitates mouth opening, clicking, facial asymmetry and alteration in occlusion. Effective treatment modalities described in literature are varied ranging from conservative therapy to surgical management based on the severity of the disease process as graded by Wilkes's classification. Non-resolution of symptoms either spontaneously or following conservative therapy, arthrocentesis/arthroscopy, remains the main indication for surgical management [3]. The position of the disc and its structural integrity determine the choice of surgical procedure. The various surgical procedures advocated to manage ID are disc repositioning, discectomy with arthroplasty and joint replacement [3].

Disc repositioning is considered ideal in patients with displaced but salvageable disc. Conventional method of disc repositioning involves suturing the disc to adjacent soft tissues which is associated with relapse of clinical symptoms [4]. To overcome this drawback, Cottrell & Wolford proposed the use of rigid anchoring devices for stable results after disc repositioning [5]. This case report demonstrates the effective use of the same, in a patient with ID, who exhibited anterior disc displacement without reduction.

## CASE REPORT

A 32-year-old, male patient presented with complaints of pain in front of the right ear for a duration of two years. Further history revealed debilitating discomfort in routine life with progressive restriction in mouth opening, due to pain. The patient had undergone conservative management for the same, for a period of 18 months using inter-occlusal splints and physiotherapy. A thorough examination of the temporomandibular joint, masticatory muscles, range of motion and intra-oral evaluation for occlusion as well as signs of parafunctional habits, was done. The significant features elicited on clinical examination were (1) Painful mouth opening with inter-incisal opening of 18mm (Figure 1) (2) tenderness involving the right TM joint. No parafunctional habits could be elicited.

Based on the clinical findings, a diagnosis of internal derangement with "anterior disc displacement without reduction" (Closed lock), was arrived at. Magnetic Resonance Imaging (MRI) demonstrated anteriorly displaced articular disc on the right side with no recapture on opening the mouth (Figure 2). Disc deformation on mouth opening, was also evident.

**Figure 1: Pre-operative image of patient demonstrating restricted mouth opening**

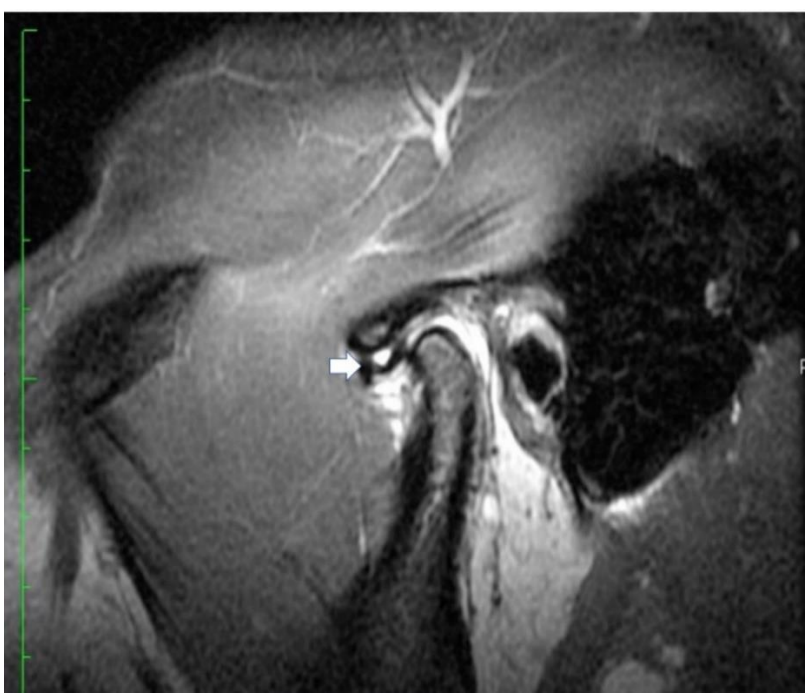

**Figure 2: Magnetic resonance imaging of the right TMJ in open mouth position demonstrating anteriorly displaced disc with no recapture (white arrow). The disc demonstrates deformation on mouth opening**

## SURGICAL TECHNIQUE

Under general anesthesia, the right TMJ and peri joint area were exposed using a preauricular incision with a Thoma's temporal modification. A deep sub-fascial approach was used to access the joint while minimizing risk to the facial nerve. After exposure of the joint, the capsule was incised with an inverted "L" incision to expose the articular surfaces. The disc was identified, and lysis was performed to release it and mobilize freely. The retro-discal tissue was detached from the posterior disc surface. A trial positioning of the disc was performed over the condyle to confirm its anchorage position. The mandible was then kept in an open mouth position to facilitate good visualization and exposure of the posterior condylar head region. A pilot drill was placed in the posterolateral surface of the condyle about 8 to 10mm from the superior aspect of the condylar head (Figure 3). The Mitek® mini anchor (DePuy, Johnson & Johnson, USA) (Figure 4) was then anchored to the pilot hole using the applicator (Figure 5). The 2-0 ethibond polyester anchoring cords were then sutured to the postero-medial and postero-lateral aspects of the disc which anchored the disc to the desired "over-corrected" position while providing good restoration of the disc-condyle relationship. The mandible was opened to observe the rotation and translation of the condyle along the fossa and post eminence plane. The capsule was then passively approximated using 3-0 vicryl sutures and the surgical wound was closed in layers using 3-0 vicryl and 4-0 ethilon. A compression dressing was applied to contain edema.

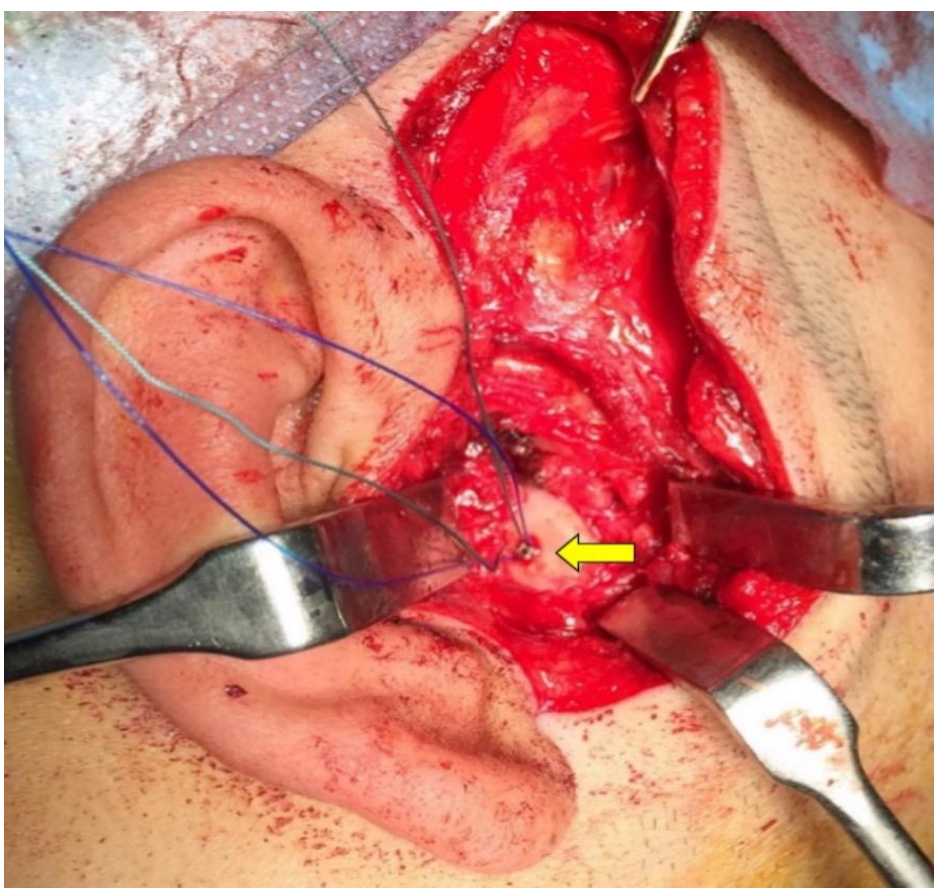

**Figure 3: Pilot drill for anchor placement on the postero-lateral aspect of the condylar head**

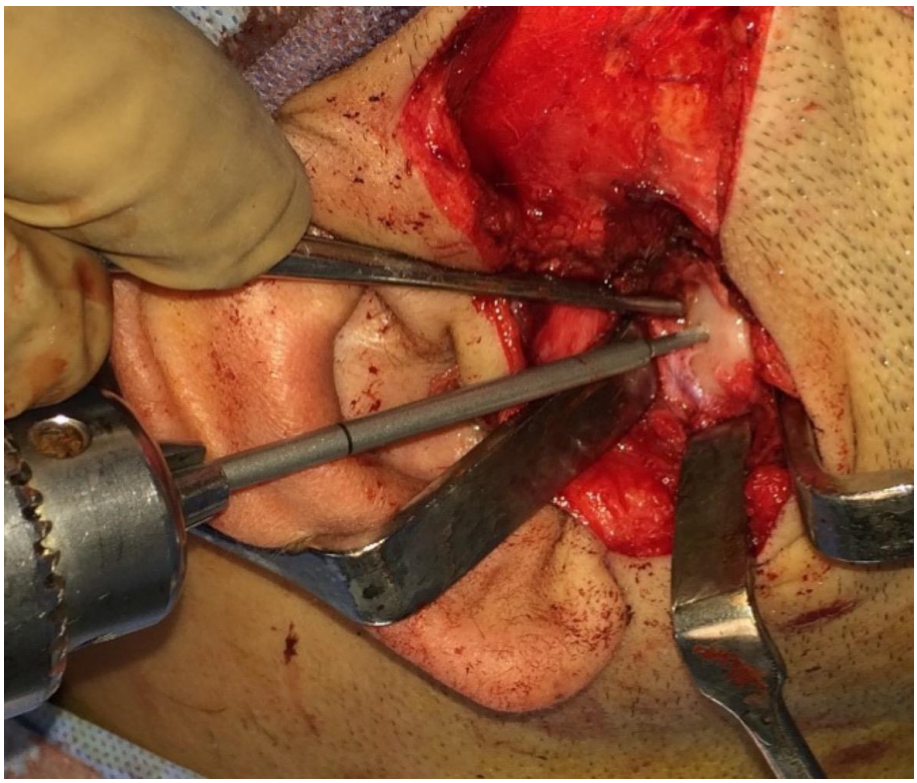

**Figure 4: Demonstration of mitek mini anchor with anchor sutures**

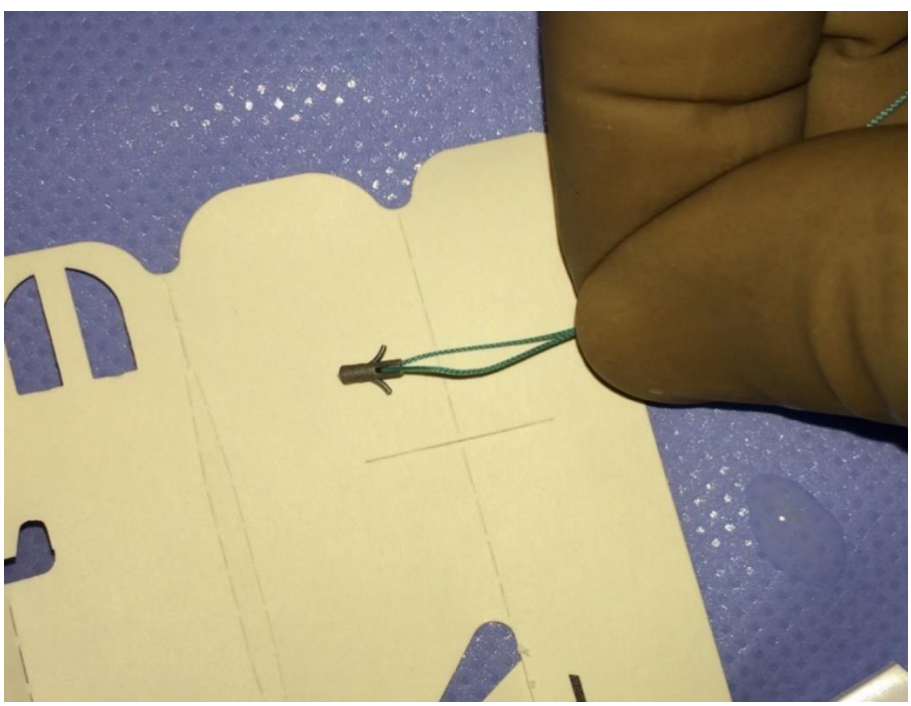

**Figure 5: Mini anchor inserted into the postero-lateral aspect of the condylar head (yellow arrow).**

**POST-OPERATIVE RECOVERY**

Post-operative healing was uneventful with intact facial nerve function and the patient was discharged on the second post-operative day, with a 5-day course of antibiotics and anti-inflammatory drugs. Physiotherapy for the joint in the form of active mouth opening was initiated on the 3rd post-operative day and was continued for 3 months with the use of a Therabite® exerciser. Patient demonstrated painfree, mouth opening of 38 mm after 4 weeks (Figure 6) which has remained stable for the last 6 years.

**Figure 6: One-month postoperative image of patient demonstrating improved mouth opening**

## DISCUSSION

Literature reveals that symptoms of internal derangement resolve spontaneously in many patients within a year [5]. However, non-resolving condition is observed in 25-33% of patients who require proper therapy. The treatment options for internal derangement extend over a wide spectrum from non-surgical to surgical modalities, each aiming at specific end points namely decreasing joint overload, pain and inflammation while improving the joint movements. The nonsurgical modalities include patient awareness measures regarding predisposing habits such as bruxism, soft diet, occlusal appliance therapy for eliminating parafunctional habits, pharmacotherapy with NSAIDs, sedatives, muscle relaxants etc and stress reduction protocols.

In patients who are refractory to conservative methods, especially in ID characterized by disc displacement without reduction, the most important aspect remains restitution of normal position of the displaced disc and restoration of the ideal disc-condyle relationship. Annandale is credited with the first description of disc repositioning technique for displaced discs in 1887 [6]. The success rates attributed to this technique is 70-95% [1]. Disc repositioning may be performed by arthroscopic or open joint surgery [2]. The common method of repositioning the disc by suturing to the peri-joint tissues does not ensure proper positioning of the disc between the condyle and the fossa during movements. This was negated by the introduction of techniques called “rigid disc anchorage” which secured the disc to implants anchored into condyle. A comparative MRI study by Ren et al [4] has clearly established that in cases with rigid disc anchorage, the disc is always positioned between the condyle and fossa, thus permitting smooth movements.

Cottrell and Wolford introduced the Mitek® mini anchor for disc repositioning. The technique was further refined and popularized by Mehra and Wolford [5]. The authors of this case report have also used the same technique with successful long-term outcomes (6 years follow up period) in a patient with disc displacement without reduction. Over correction of the final disc position is an essential component in maintaining long-term results. In addition to the excellent patient satisfaction in the post-operative period, the advantages of using this technique from a surgeon’s point of view include the following (1) ease of application of anchor (2) fail-proof anchorage design which negates implant failure (3) the presence of an eyelet in the anchor device enables attachment of additional anchoring sutures, as required (4) submerged anchor design which does not injure the retrodiscal tissues unlike the orthodontic miniscrews [7]. The surgical outcomes may be augmented by the modification suggested by He et al[2] who incorporated autogenous fat graft at the site of disc release anteriorly to prevent late fibrosis and relapse [2].

The limitations of mitek anchor screws are placement of metallic implant in-vivo, difficulty in retrieval, when needed and the cost. These may be overcome by using resorbable anchors [8] and economical orthodontic screws [7] respectively.

## CONCLUSION

Surgical repositioning of displaced disc may be a warranted procedure in patients with anterior disc displacement with or without reduction, who are refractory to conservative treatment. The reported case demonstrates that the Mitek® mini anchor provides a reliable and stable anchoring solution to the repositioned disc, while enabling improved surgical outcomes.

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**Conflicts of interest** - There are no conflicts of interest.

## REFERENCES


1. Perez D, Brown ZL, Amarista FJ, Pham M. Treatment of malocclusion after TMJ disc repositioning with Mitek anchors. A retrospective review. J Stomatol Oral Maxillofac Surg. 2019 Dec;120(6):540-544.

2. He D, Yang C, Zhang S, Wilson JJ. Modified temporomandibular joint disc repositioning with miniscrew anchor: part I-surgical technique. J Oral Maxillofac Surg. 2015 Jan;73(1):47.e1-9.

3. Warburton G. Internal derangements of the temporomandibular joint. Oral and Maxillofacial Surgery for the Clinician. 2021:1361-80.

4. Ren R, Dai J, Si J, Cai B, Shi J. Changes of disc status in adult patients with condylar head fracture who did or did not undergo disc anchoring operation. J Craniomaxillofac Surg. 2018 Dec;46(12):2248-2255.

5. Mehra P, Wolford LM. The Mitek mini anchor for TMJ disc repositioning: surgical technique and results. Int J Oral Maxillofac Surg. 2001 Dec;30(6):497-503

6. Annandale T. On displacement of the inter-articular cartilage of the lower jaw, and its treatment by operation. Lancet 1887;129:411.

7. Rajkumar K, Roy Chowdhury SK, Sinha R. Clinical and MRI Evaluation of Orthodontic Mini-Screws for Disc Repositioning in Internal Derangement of TMJ: A Prospective Study. J Maxillofac Oral Surg. 2018 Mar;17(1):52-58

8. Spallaccia F, Rivaroli A, Basile E, Cascone P. Disk repositioning surgery of the temporomandibular joint with bioabsorbable anchor. J Craniofac Surg. 2013;24(5):1792-5.


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