DOI: 10.7860/JCDR/2026/88080.24433

Case Report

Dentistry Section

Autogenous Dermis-fat Graft in Fibrous Ankylosis of the Temporomandibular Joint: A Case Report

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ABSTRACT

Post-traumatic fibrous ankylosis of the Temporomandibular Joint (TMJ) is a debilitating condition characterised by restricted mandibular movements, impaired mastication, and reduced quality of life. Early diagnosis may be challenging, and surgical intervention is often required when conservative management fails. A 35-year-old male presented with a one-month history of progressive limitation in mouth opening, difficulty in mastication, and intermittent pain in the right preauricular region following facial trauma due to a road traffic accident involving a direct impact to the chin. Immediately after the injury, the patient was initially diagnosed with post-traumatic trismus at a local healthcare facility and managed conservatively with analgesics and muscle relaxants for approximately two weeks without symptomatic improvement. Clinical examination revealed a Maximum Interincisal Opening (MIO) of 7 mm, with Class I occlusion and restricted lateral and protrusive mandibular movements. Magnetic Resonance Imaging (MRI) demonstrated fibrous ankylosis of the right TMJ with condylar irregularity, anterior disc displacement, and reduced joint space. The patient underwent interpositional arthroplasty using an autogenous dermis-fat graft following complete excision of fibrous adhesions and creation of an adequate joint gap of approximately 10 mm. Immediate postoperative MIO was 32 mm, which improved to 38 mm at 3-month follow-up with no evidence of recurrence. Facial nerve function remained normal (House-Brackmann Grade I), and no donor site complications were observed. Autogenous dermis-fat graft serves as an effective interpositional material due to its biological compatibility and ability to reduce fibrosis and recurrence. Early physiotherapy plays a critical role in maintaining functional outcomes.

Keywords: Interpositional arthroplasty, Mandibular hypomobility, Mouth opening limitation, Post-traumatic ankylosis

CASE REPORT

A 35-year-old male patient presented to the Department of Oral and Maxillofacial Surgery with a one-month history of progressive limitation in mouth opening, difficulty in mastication, and intermittent pain in the right pre-auricular region. The symptoms began following a road traffic accident involving a direct impact to the chin.

Immediately after the injury, the patient reported to a local healthcare facility where he was managed conservatively with analgesics and muscle relaxants for approximately two weeks. No radiographic investigations were performed at that time. Despite treatment, there was no improvement in mouth opening, prompting referral for further evaluation.

The patient had no significant past medical or dental history and no prior history of TMJ disorders. There was no history of prolonged immobilisation.

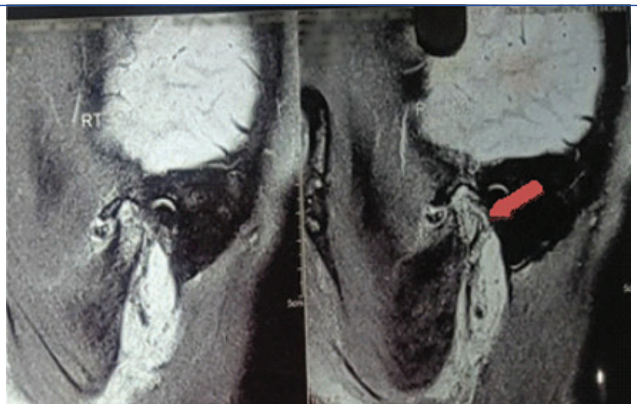
On clinical examination, the MIO was 7 mm without any mandibular deviation [Table/Fig-1]. Angle's Class I malocclusion, with restricted lateral and protrusive movements, was noted. Facial symmetry was maintained, with no visible swelling in the preauricular region. Mild tenderness was noted on palpation over the right TMJ.

MRI revealed irregularity of the right mandibular condylar head with loss of normal articular surface continuity and associated post-traumatic degenerative changes. Anterior displacement of the articular disc, reduced joint space, and surrounding soft-tissue changes suggestive of fibrous adhesions were noted [Table/Fig-2]. MRI was preferred to evaluate soft-tissue components, including disc position and fibrous adhesions, which are not adequately visualised on Computed Tomography (CT).

Although the interval between trauma and presentation was relatively short (approximately one month), the diagnosis of post-traumatic fibrous ankylosis was based on the combination of severe restriction in mandibular movement and MRI findings demonstrating



[Table/Fig-1]: Preoperative clinical photograph showing severely restricted mouth opening with a Maximum Interincisal Opening (MIO) of approximately 7 mm.



[Table/Fig-2]: Magnetic Resonance Imaging (MRI) of the right Temporomandibular Joint (TMJ) showing irregularity and fragmentation of the condylar head (arrow), anterior displacement of the articular disc, and reduced joint space suggestive of fibrous ankylosis.

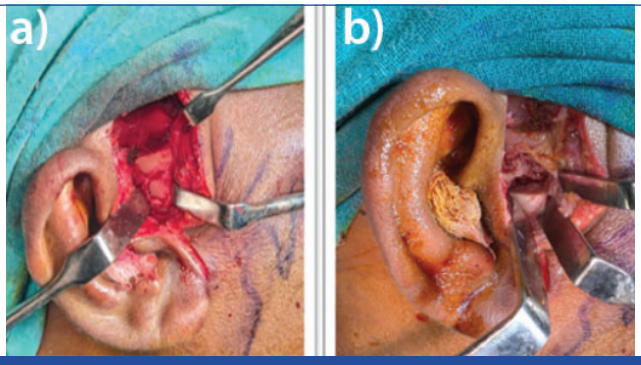
reduced joint space and fibrous soft-tissue changes within the TMJ. The observed condylar irregularity was interpreted as secondary post-traumatic degenerative change rather than evidence of bony ankylosis.

Based on the clinical and radiological findings, a diagnosis of post-traumatic fibrous ankylosis of the right TMJ with secondary degenerative condylar changes was established.

Written informed consent was obtained from the patient for both treatment and publication of clinical data and images prior to surgical intervention. Differential diagnoses considered included trismus due to masticatory muscle spasm, disc displacement without reduction, coronoid hyperplasia, TMJ infection, and neoplastic pathology. These conditions were ruled out based on the clinical presentation and characteristic MRI findings, including condylar irregularity, anterior disc displacement, reduced joint space, and presence of fibrous adhesions within the TMJ.

Surgical management was performed under general anaesthesia with naso-endotracheal intubation. The procedure duration was approximately 90 minutes, and no intraoperative complications were encountered. A preauricular (modified Blair) incision was used to access the joint. Dissection was carried out superficial to the Superficial Musculoaponeurotic System (SMAS), with careful identification and preservation of facial nerve branches.

Dense fibrous adhesions involving the joint space were completely excised. The condylar surface was contoured, and a gap of approximately 10 mm was created between the condyle and glenoid fossa [Table/Fig-3]. Intraoperatively, a maximum mouth opening of 35 mm was achieved and confirmed manually.



[Table/Fig-3]: Intraoperative photographs of Temporomandibular Joint (TMJ) surgery: (a) Exposure of the TMJ with identification of fibrous ankylotic tissue; (b) Joint space following excision of fibrous adhesions and creation of an adequate gap for interpositional arthroplasty.

An autogenous dermis-fat graft measuring approximately 3×2×1 cm was harvested from the lower abdominal region [Table/Fig-4]. The epidermis was removed, and the graft was interposed between the condylar stump and glenoid fossa [Table/Fig-5]. Graft stability and adequate prevention of unwanted joint movement were confirmed intraoperatively by passive mandibular movements and maintenance of the created joint space. The graft was stabilised using resorbable sutures (3-0 Vicryl).



[Table/Fig-4]: Intraoperative harvesting of autogenous dermis-fat graft: (a) Exposure of the lower abdominal donor site during graft harvesting; (b) Harvested autogenous dermis-fat graft following removal of the epidermal layer and preparation for interpositional placement.



[Table/Fig-5]: Intraoperative photographs demonstrating placement of autogenous dermis-fat graft: (a) Interposition of the dermis-fat graft between the condylar stump and glenoid fossa following creation of the joint gap; (b) Final positioning and stabilisation of the graft within the joint space to maintain separation of the articular surfaces.

Haemostasis was achieved, and the surgical site was closed in layers. No intraoperative complications were noted.

Postoperatively, facial nerve function was assessed using the House-Brackmann grading system [1] and was found to be Grade I (normal function). The immediate postoperative MIO was 32 mm.

The patient was prescribed antibiotics, and non-steroidal anti-inflammatory drugs, and was advised to follow a soft diet. A structured physiotherapy protocol was initiated on postoperative day 5, including:

- Passive mouth opening exercises using wooden spatulas (3 sessions/day);
- Active range-of-motion exercises (10 repetitions/session);
- Gradual increase in intensity over six weeks.

At 3-month follow-up, the patient demonstrated a stable MIO of 38 mm, with improved mandibular function and no clinical or radiological evidence of recurrence [Table/Fig-6].



[Table/Fig-6]: Postoperative clinical photograph showing improved mouth opening at 3-month follow-up with a Maximum Interincisal Opening (MIO) of 38 mm.

The donor site healed uneventfully, with no evidence of infection, haematoma, or scarring complications.

DISCUSSION

The TMJ ankylosis is most commonly associated with trauma, followed by infection and inflammatory conditions involving the TMJ region [2]. In the present case, the aetiology was post-traumatic, with a history of injury to the chin, resulting in progressive restriction of mandibular movements and secondary degenerative changes of the condyle.

One of the major factors contributing to recurrence of TMJ ankylosis is inadequate removal of ankylotic tissue. Complete excision of fibrous adhesions and creation of an adequate joint gap are therefore essential to restore mandibular mobility and reduce the risk of reankylosis [2,3]. In the present case, a gap of approximately 10 mm was created, and free mandibular movement was achieved intraoperatively.

Surgical management includes gap arthroplasty, interpositional arthroplasty, and total joint reconstruction [4,5]. Gap arthroplasty, although technically simpler, has been associated with higher rates of reankylosis compared with interpositional arthroplasty because of the potential for re-adhesion of the joint surfaces [3,6]. Interpositional arthroplasty is therefore preferred, as placement of an interpositional material helps maintain joint space and reduce recurrence. Various interpositional materials such as temporalis muscle/fascia, dermis-fat graft, buccal fat pad, cartilage, and alloplastic materials have been described for interpositional arthroplasty. However, no single material has been universally accepted as the gold standard, and the choice largely depends on surgeon preference, availability, and patient-related factors [5-7].

Temporalis muscle or fascia flaps are widely used due to their proximity and reliable vascularity, with reported good long-term outcomes and low recurrence rates. However, they may be associated with donor site morbidity, temporal hollowing, and limited bulk over time [8]. Buccal fat pad grafts offer ease of harvest and minimal donor site morbidity; however, outcomes may vary depending on the interpositional material used and patient-related factors [7]. Costochondral grafts are primarily indicated in paediatric patients because of their growth potential; however, in adults, their use is limited by complications such as unpredictable growth, overgrowth, graft fracture, and donor-site morbidity [4,5]. Total joint replacement is generally reserved for recurrent, complex, or severe ankylosis and may not be justified in isolated fibrous ankylosis because of cost considerations and prosthesis-related complications [5,9].

Autogenous dermis-fat graft was selected in the present case because of its biocompatibility, availability, and favourable clinical outcomes reported in the management of TMJ ankylosis. As an interpositional material, the graft occupies the created gap and may help reduce the likelihood of re-ankylosis while maintaining mandibular function [10,11]. A recent study demonstrated favourable clinical outcomes with the use of dermis-fat grafts, with sustained improvement in mouth opening and functional recovery following TMJ ankylosis surgery [12].

However, dermis-fat grafts are not without limitations. Partial resorption of the fat component, unpredictable long-term volume stability, and relatively limited high-quality comparative evidence compared with temporalis muscle flaps remain concerns. These factors must be considered while selecting the interpositional material.

Recent systematic reviews have further supported the effectiveness of dermis-fat grafts as a reliable interpositional material with satisfactory functional outcomes and reduced recurrence rates [13]. Recurrence of TMJ ankylosis is influenced by multiple factors, including inadequate surgical clearance, insufficient gap creation, poor patient compliance with physiotherapy, and severity of the initial pathology. Early initiation of structured postoperative physiotherapy plays a crucial role in preventing fibrosis and maintaining functional outcomes.

In the present case, there was significant improvement in mouth opening from 7 mm preoperatively to 38 mm at 3-month follow-up, with no evidence of early recurrence.

Despite the favourable outcome, certain limitations must be acknowledged. This is a single case report with a short follow-up duration of three months. Long-term outcomes, including graft survival and recurrence rates, could not be assessed. Additionally, postoperative CT was not performed to objectively evaluate the maintenance of joint space, and standardised outcome scoring systems were not utilised.

CONCLUSION(S)

Autogenous dermis-fat graft interpositional arthroplasty is an effective and biologically compatible treatment option for post-traumatic fibrous ankylosis of the TMJ. It provides satisfactory functional outcomes and reduces recurrence when combined with meticulous surgical technique and structured physiotherapy. However, long-term follow-up and larger studies are required to establish its definitive superiority over other interpositional materials.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Feb 26, 2026
- Manual Googling: Jun 17, 2026
- iThenticate Software: Jun 20, 2026 (5%)

ETYMOLOGY: Author Origin

EMENDATIONS: 8

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Feb 07, 2026**
Date of Peer Review: **Mar 18, 2026**
Date of Acceptance: **Jun 23, 2026**
Date of Publishing: **Oct 01, 2026**