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Case Report

Unilateral Temporomandibular Joint Ankylosis in an 8-Year-Old Following Trauma: A Case Report

[1]Rohit Barak, [2]Abhishek Haldia, [3]Tripti Sharma, [4]Rinku Mathur, [5]Sonal Priya Bhansali, [6]Apurva Deshmukh

[1,6]Post Graduate Student, [2,3,4]Professor, Department of Paediatric and Preventive Dentistry, RUHS College of Dental Sciences, Jaipur, Rajasthan, India;
[5]Professor, Department of Oral and Maxillofacial Surgery, RUHS College of Dental Sciences, Jaipur, Rajasthan, India

ABSTRACT:
Temporomandibular joint (TMJ) ankylosis is a debilitating craniofacial condition characterized by restricted mandibular movements due to intra-articular fusion. Pediatric condylar fractures are the most common cause, often leading to growth disturbances and functional impairment if left untreated.
This case report presents the clinical and radiographic features of unilateral TMJ ankylosis in an 8-year-old female following repeated trauma. Gap arthroplasty with disc repositioning was performed, followed by a structured physiotherapy regimen. At 6-month follow-up, satisfactory mouth opening and radiographic improvement were noted without recurrence.
Key words: TMJ ankylosis, pediatric trauma, gap arthroplasty, disc repositioning, physiotherapy

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Corresponding Author: Rohit Barak, Post Graduate Student, Department of Paediatric and Preventive Dentistry, RUHS College of Dental Sciences, Jaipur, Rajasthan, India;

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INTRODUCTION

Temporomandibular joint (TMJ) ankylosis is defined as fibrous or bony adhesion between the condylar head of the mandible and the glenoid fossa, resulting in limited or complete loss of joint function[1]. The condition is of particular concern in children due to its impact on growth, esthetics, mastication, and psychosocial well-being[2].The incidence of TMJ ankylosis is highest in developing countries, where trauma is the leading etiological factor[3]. Pediatric condylar fractures, particularly those left untreated or managed inadequately, predispose to ankylosis because of the high osteogenic potential of children[4]. Other causes include infection, systemic diseases (such as ankylosing spondylitis), and iatrogenic factors[5].

Children with TMJ ankylosis present with restricted mouth opening, deviation on opening, facial asymmetry, poor oral hygiene, and difficulty in mastication and speech[6]. Long-standing cases result in "bird-face" deformity due to micrognathia and retruded chin. In growing children, ankylosis may also lead to obstructive sleep apnea (OSA) due to compromised airway space[7].

The essence of management lies in **breaking the pathological union to restore function**. As highlighted in our treatment philosophy—**"Create the gap… to close the gap"**—surgical creation of an adequate gap is not merely removal of ankylotic tissue, but a biological reset that allows restoration of mandibular mobility and long-term function.

Sawhney's classification (1986) divides TMJ ankylosis into four types depending on the site and extent of fusion. Type III and IV, which involve extensive bony fusion, are common in pediatric trauma cases[8]. The management aims at restoring joint function, preventing recurrence, correcting deformities, and allowing normal mandibular growth[1]. Several surgical techniques have been described, including gap arthroplasty, interpositional arthroplasty, and joint reconstruction[9]. Regardless of

the method, aggressive physiotherapy is mandatory postoperatively to prevent relapse[10].

This case report highlights the clinical and surgical management of unilateral TMJ ankylosis in an 8-year-old girl caused by repeated trauma, emphasizing the importance of early diagnosis, surgical release, and postoperative physiotherapy.

CASE REPORT :"Create the Gap… to Close the Gap"

An 8-year-old female presented with a complaint of restricted mouth opening for the past four months. Her parents reported that in October 2023, she had sustained trauma following a fall from a bike, after which she experienced pain and difficulty in chewing. At that time, a radiographic evaluation revealed a left condylar fracture, and surgical intervention was advised. However, the parents declined treatment. Four months later, following another fall, the patient gradually developed progressive reduction in mouth opening, prompting her presentation to our department.

On extraoral examination, the patient exhibited a convex facial profile with a retruded chin. Mouth opening was severely restricted to only 5 mm. Palpation revealed a hard bony prominence in the left pre-auricular region with an absence of joint movement [Fig. 1]. No obvious facial asymmetry was noted. Intraorally, the mandibular midline was shifted 2–3 mm toward the left side, and mandibular movements were markedly reduced [Fig. 2]. Facial nerve examination revealed no abnormalities.

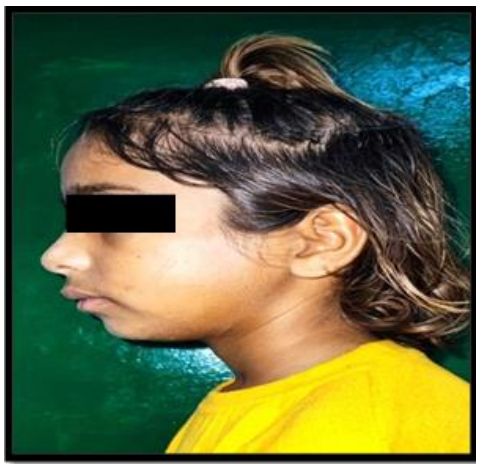


Figure 1. Preoperative facial profile showing convex profile and retruded chin. mouth opening (5 mm) and midline shift (2-3 mm) to the left side.

Figure 2. Intraoral view demonstrating reduced

Radiographic investigations were carried out. An orthopantomogram (OPG) revealed fusion of the left condylar region [Fig. 3], while cone beam computed tomography (CBCT) confirmed the presence of unilateral bony ankylosis of the left temporomandibular joint [Fig. 4]. Based on clinical and radiological findings, a diagnosis of unilateral TMJ ankylosis was established.

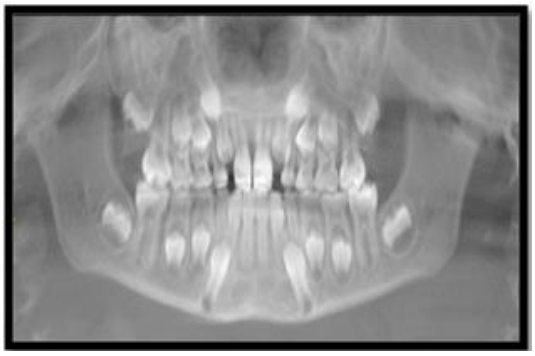


Figure 3. Preoperative panoramic radiograph (OPG) showing fusion of the left condylar region.

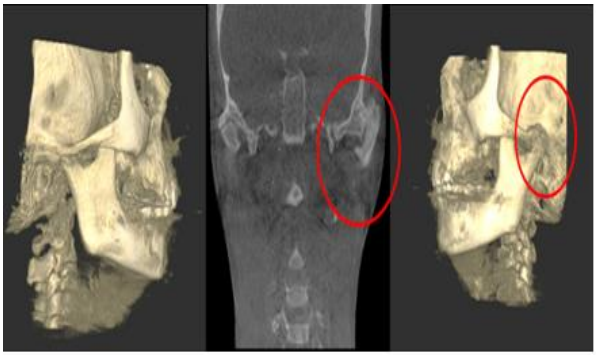


Figure 4. Preoperative CBCT scan confirmingbony ankylosis of the left temporomandibular joint.

The patient underwent surgical management under general anesthesia. A full-thickness mucoperiosteal flap was carefully reflected to gain access to the ankylotic mass [Fig. 5]. The fibrous and bony components were excised, and a sufficient gap was created between the mandibular condyle and the glenoid fossa [Fig. 6].The articular

disc was preserved and repositioned in order to maintain joint function and reduce the risk of recurrence [Fig. 7]. Hemostasis was achieved, and the wound was closed in layers.

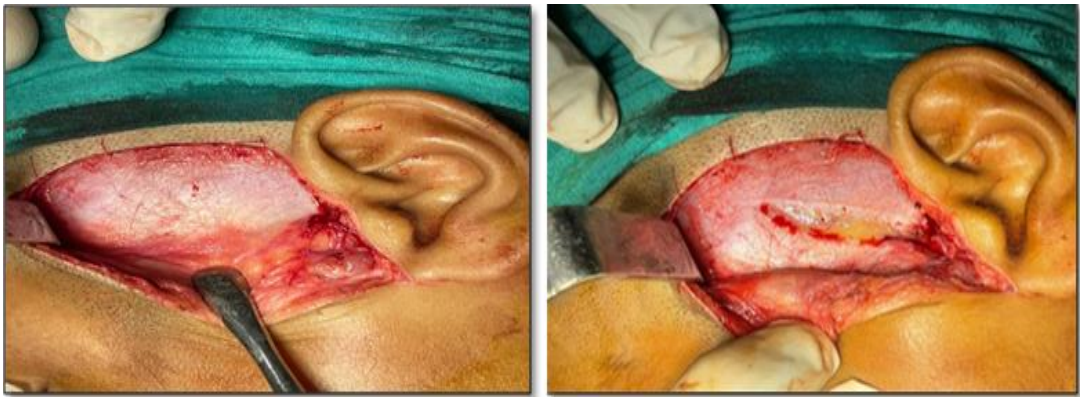


Figure 5. Intraoperative view following reflection of full-thickness mucoperiosteal flap, exposing ankylotic mass.

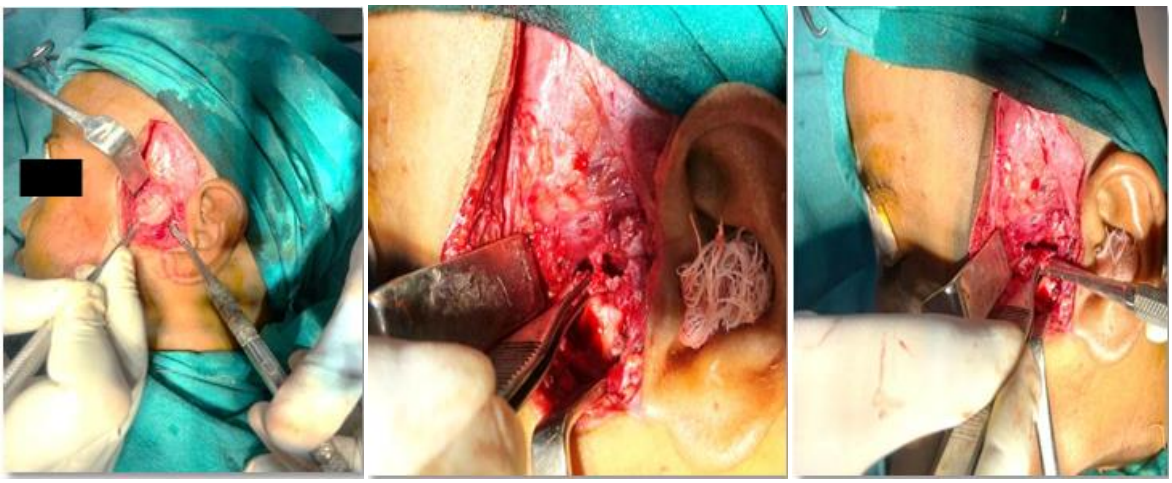


Figure 6. Surgical removal of ankylotic mass with creation of adequate gap.

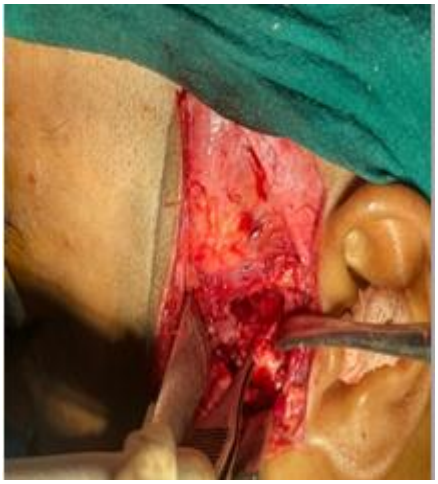


Figure 7. Repositioning of articular disc following ankylotic mass removal.

Immediately after the surgical procedure mouth opening was increased to 32-35mm [Fig.8]

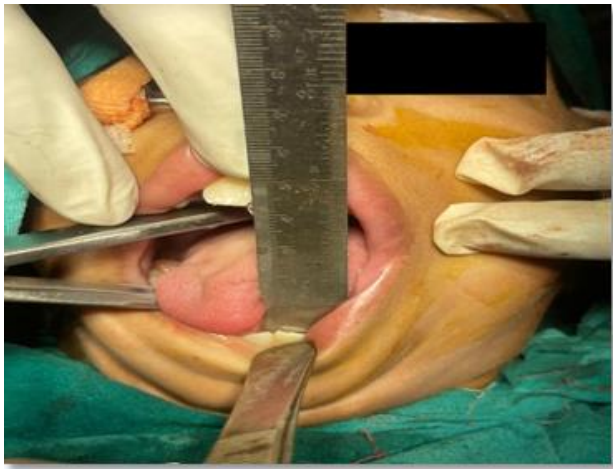


Figure 8. Immediate postoperative mouth opening improved (32-35mm).

Postoperatively, physiotherapy was initiated as soon as pain subsided. Initially, the patient performed active mouth opening using her own fingers to build confidence and avoid excessive force. Gradually, wooden tongue blades were introduced to increase the range of motion, with exercises performed for 15 minutes, five times daily under supervision. Parents were counseled to ensure compliance, and the follow-up protocol included weekly visits for the first month, biweekly visits for the next three months, and monthly reviews thereafter for up to one year.

At six months follow-up, clinical examination revealed satisfactory mouth opening, with no signs of recurrence [Fig. 9].

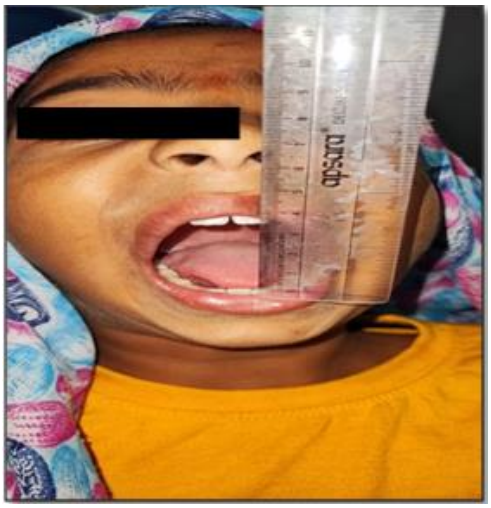
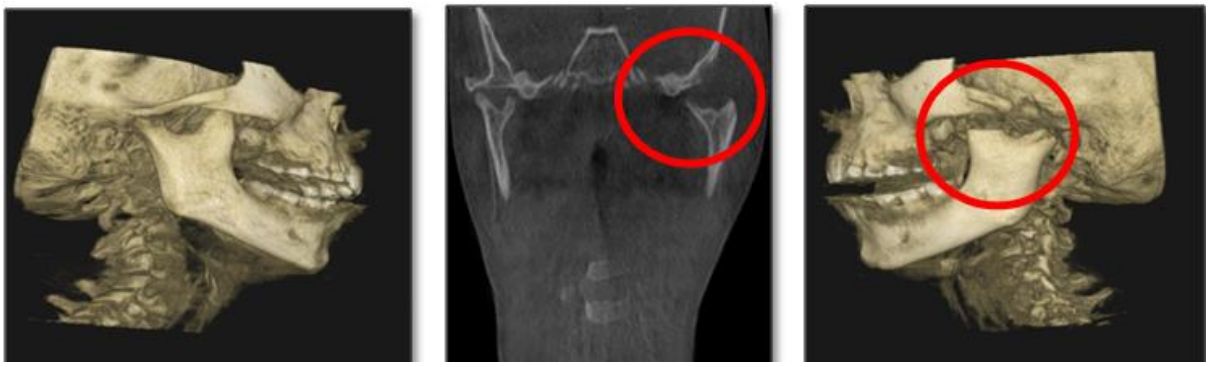


Figure 9. Six-month postoperative clinical view showing satisfactory mouth opening.



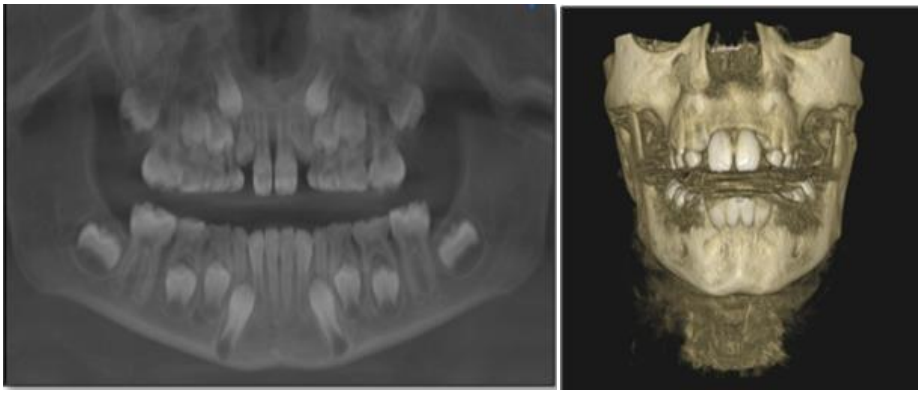


Figure 10. Six-month postoperative panoramic radiograph (OPG) and CBCT showing maintained gap and improved joint morphology.

Radiographic evaluation confirmed maintenance of the surgically created gap and improvement in joint morphology [Fig. 10]. The patient was able to resume normal mastication and speech, with significant improvement in facial appearance and function.

DISCUSSION

TMJ ankylosis in pediatric patients is a complex condition due to its dual impact: functional impairment and disruption of facial growth. If left untreated, it may lead to severe dentofacial deformities, malocclusion, speech difficulty, and psychosocial distress[2,3].

The essence of successful management can be captured in the phrase **"Create the gap… to close the gap."** By surgically creating a gap, we prevent re-ossification and recurrence. By closing the functional gap in the patient's quality of life—restoring mastication, speech, and growth—we achieve the true therapeutic goal[1,7].

Trauma accounts for 70–80% of pediatric TMJ ankylosis cases[4]. Condylar fractures involving intracapsular hematoma formation, followed by fibrosis and calcification, often progress to ankylosis[5]. Repeated trauma, as in this case, further accelerates this process.

Surgical Management: Surgical treatment remains the gold standard. Gap arthroplasty, performed here, is widely accepted because it is simple, cost-effective, and associated with good functional outcomes[7]. However, recurrence rates range between 10–30%[8]. Interpositional arthroplasty, using autogenous materials (temporalis fascia, dermis, fat) or alloplastic grafts, has been advocated to reduce recurrence[9,11]. Costochondral grafting has the additional advantage of growth potential, making it useful in children[12], though it may result in unpredictable overgrowth. Distraction osteogenesis and alloplastic joint replacement are newer options reserved for severe case[13].

In our case, disc repositioning was performed. Literature suggests that preservation of the articular disc, when possible, provides a biologically acceptable joint surface, reduces recurrence, and improves functional outcomes[14].

Physiotherapy and Compliance: The success of surgery is highly dependent on aggressive postoperative physiotherapy. Studies by Kaban et al.[1] and Erol et al.[10] stress that even the best surgical procedure may fail without strict exercise protocols. Compliance is often challenging in children due to discomfort and lack of motivation. Therefore, parental involvement and regular follow-up are critical[15]. In this case, a finger-assisted mouth opening protocol was followed by progressive use of wooden tongue blades, which has been proven effective in maintaining range of motion[16].

Thus, the phrase **"Create the gap… to close the gap"** encapsulates the dual responsibility of surgeons and rehabilitation teams in turning surgical release into a lifelong functional success.Recurrence is the most feared complication, with reported rates up to 53% in some series[17]. Early diagnosis, meticulous surgical technique, preservation of normal structures, and physiotherapy are key to prevention. Long-term monitoring is essential to evaluate mandibular growth, occlusion, and airway development.

This case demonstrates that timely surgical intervention with disc repositioning and structured physiotherapy can restore satisfactory function and prevent recurrence. It also highlights the need for early parental counseling when pediatric condylar fractures occur, as neglect can progress to ankylosis.

CONCLUSION

TMJ ankylosis in children is more than a localized pathology—it is a developmental, functional, and psychosocial burden. This case illustrates that even a neglected condylar fracture can progress into a crippling deformity.

Gap arthroplasty with disc repositioning, followed by aggressive physiotherapy, restored mandibular function and quality of life in this child. Three principles emerge:

1. **Early diagnosis** of pediatric condylar trauma prevents ankylosis.

2. **Biological preservation** through disc repositioning enhances outcomes.
3. **Relentless physiotherapy** ensures long-term stability.

Ultimately, this case demonstrates that when we **"create the gap"** surgically and **"close the gap"** functionally through physiotherapy, we not only restore mandibular movement but also give a growing child the opportunity for a normal life.

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