

# Temporomandibular Joint Ankylosis in Pediatric Patient: An Unusual Bony Fusion Between Zygomatic Arch and Skull Bone

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## Abstract

### Background:

**Case presentation:** In this case report, we presented the management of a 6-year-old with a left TMJ ankylosis present since age 2 years. The clinical and imaging investigations were consistent with left temporomandibular joint ankylosis (Type IV). A left side gap arthroplasty via a modified Al Kayat Bramley approach with an interpositional arthroplasty placement of temporalis fascia graft. No post-operative complications were seen except a reduced mouth opening following initial days.

**Conclusion:** In this case report we describe an unusual case of bony ankylosis between the zygomatic arch and the temporal bone following childhood trauma. The aetiology, imaging features and surgical techniques used along with the associated complications are discussed.

### Case Report

A 6 year's old female child patient from Kullu, Himachal Pradesh, India was first presented to the Department of Oral and Maxillofacial Surgery, Government Dental College, Hospital – Shimla, Himachal Pradesh in year 2023. She came with her parents, who first noticed a limited mouth opening at 4 years of age. The limited mouth opening limited her feeding severely, and the brushing of teeth too (Figs. 1 and 2).



Fig. 1 a and b: Patient presentation at age 6 years, Extra orally a and Intra orally b

Relevant past history revealed that she had undergone a trauma due to fall while playing at age over 4 years from the 1<sup>st</sup> floor of her home.

For this the patient reported to a civil hospital nearby wherein she was given some antibiotics and her mother was assured that no further treatment of any sorts is needed, and so the treatment of the patient was delayed for a period of nearly 2 years from the date of trauma.

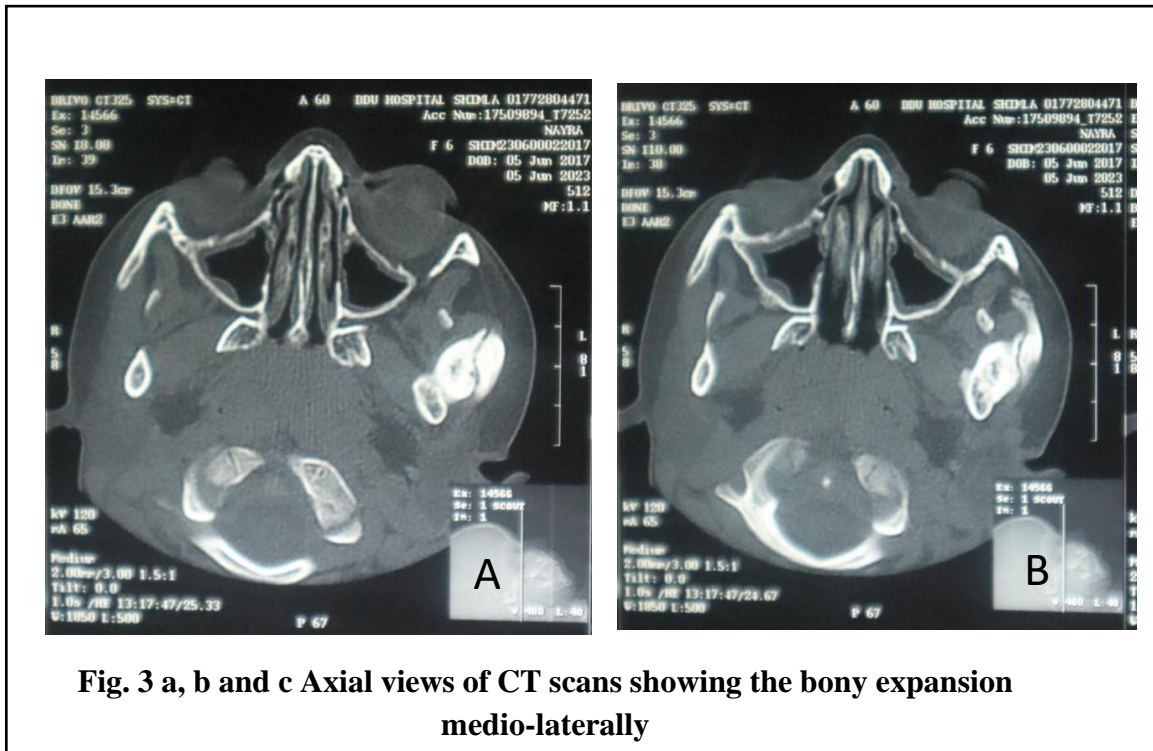


A general physical examination showed she had a normal growth spurt, with average height and weight, her cognitive development is up to par. On extra-oral examination, the child presented with a symmetrical face, no deviation of chin seen. No movement of the left temporomandibular joint (TMJ) can be palpated via external auditory meatus. No mouth opening can be observed at all.



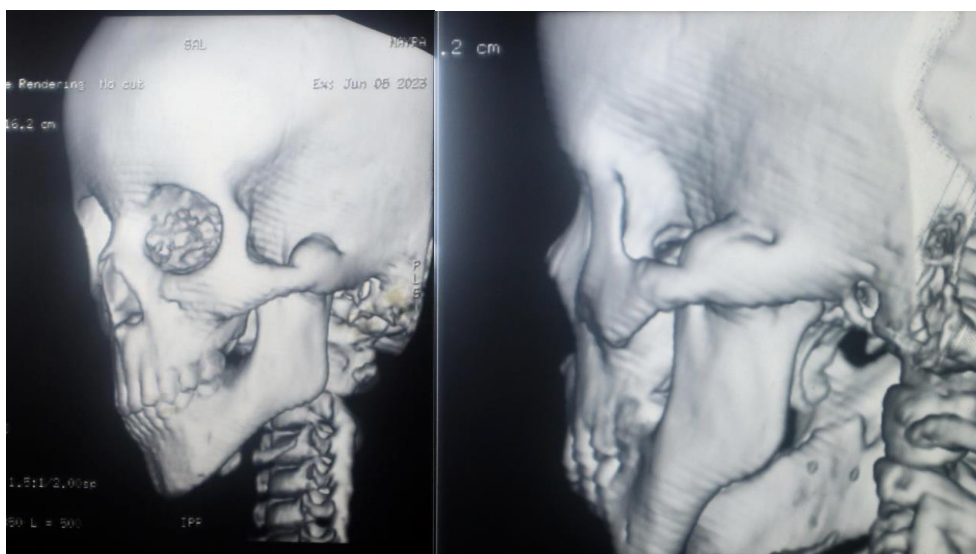
The patient had a very good oral hygiene given her limited mouth opening, the patient had a normal overjet and a normal overbite.

Imaging studies with a CT scan showed that there is a bony fusion between the zygomatic arch and temporal bone. The left TM joint showed atrophic condylar head and a rudimentary joint space (Fig. 3a, b, c). Three-dimensional reconstruction of the CT imaging scans confirmed the fusion of the left zygomatic arch, left condylar head and showed normal ramal height on both sides (Fig. 4).



**Fig. 3 a, b and c Axial views of CT scans showing the bony expansion medio-laterally**

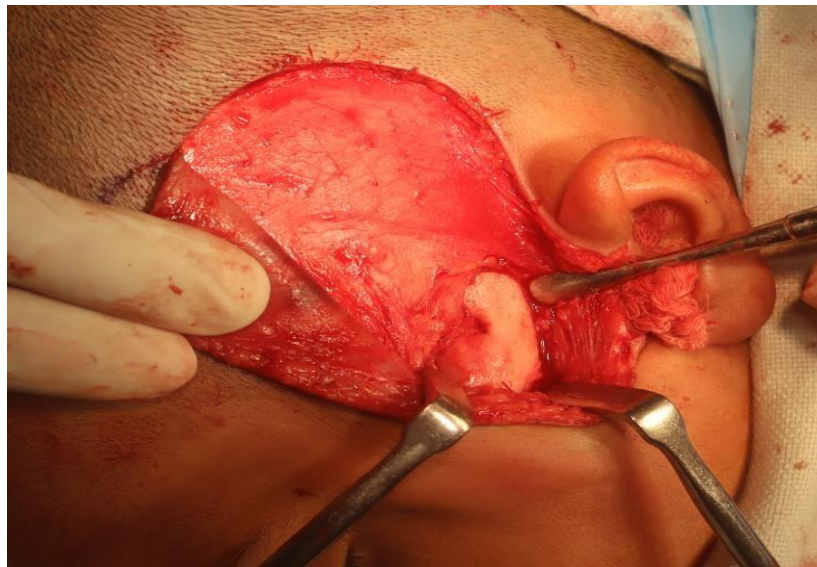
The child was diagnosed with a left temporomandibular joint ankylosis (Type III) secondary to childhood trauma. A left gap arthroplasty via a modified Al Kayat Bramley approach was performed, with an interpositional arthroplasty placement of the temporalis fascia graft.



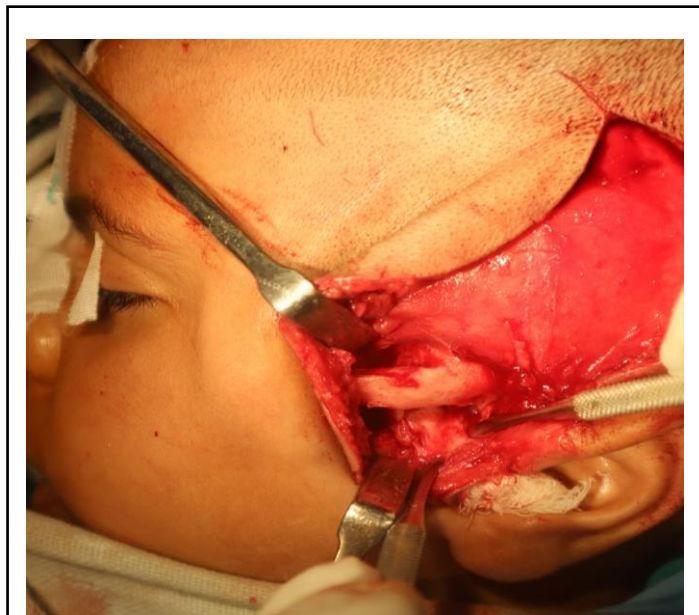
**Fig.4 3D reconstruction of the left TMJ showing fusion of the left**



The surgery was performed under general anesthesia with a nasotracheal intubation assisted by a fiber optic laryngoscope. Exposure of the left temporal region was done via an Al Kayat Bramley incision. The incision was then deepened to the superficial temporalis fascia by using a combination of blunt and sharp dissection. The flap was raised up to the zygomatic arch where in the periosteum was incised (Fig. 5). A subperiosteal plane of dissection was performed until the capsule of the joint was completely visible. Then with a help of a 2mm chisel and a steel mallet the hard bony fusion was removed from the under surface of the zygomatic arch followed by condylectomy to create an adequate gap using a fissure bur until a thin layer of bone remained on the medial aspect of the condylar unit.



**Fig.5 A modified Al Kayat Bramley flap was raised till the zygomatic arch.**



**Fig.7 Gap arthroplasty of left TMJ performed.**

The condylar stump and glenoid fossa were recontoured with surgical contouring burs. Intra-operatively, a gap of around 7 mm in the left TM joint was created (Fig. 7) and a maximum interincisal opening of 30

mm was achieved. The temporal fascia interpositional graft was then harvested based upon the size of the defect and rotated from below the zygomatic arch, into the temporomandibular joint as an interpositional tissue and secured it using vicryl sutures (Fig. 8).



**Fig.8 Inter positional temporalis graft.**

Post-operatively, all the surgical wounds healed without any sign of complications and the patient showed no other signs of any facial nerve palsy or anterior open bite, Frey's syndrome. After waiting for a period of around 4 days post-operatively the patient was asked to perform active physiotherapy as advised under parental supervision.

She was placed under a strict physiotherapy exercise commencing 5 days post-operatively under strict parental supervision. Following her discharge after a stay of 2 weeks she was advised a physiotherapy protocol to be taken under parental supervision. The patient is due for follow up.

### **Discussion**

Extra-cranial TMJ ankylosis in pediatric patients is a rare but challenging condition, often resulting from trauma or infection affecting the TMJ region during early childhood. The etiology of TMJ ankylosis involves a complex interplay of genetic predisposition, trauma, infection, and inflammatory processes. In the presented case, trauma to the left mandibular region likely triggered the inflammatory response leading to fibrosis and subsequent ankylosis.

Diagnostic imaging plays a crucial role in confirming the diagnosis of TMJ ankylosis and assessing the extent of bony fusion. Panoramic radiography provides an initial overview of the TMJ anatomy and bony changes, while CT and MRI offer detailed information regarding the extent of fusion, involvement of surrounding structures, and presence of any intra-articular pathology.

Management of extra-cranial TMJ ankylosis in pediatric patients requires a multidisciplinary approach involving oral and maxillofacial surgeons, orthodontists, and physiotherapists. Surgical intervention remains the mainstay of treatment, aimed at releasing the ankylosed joint, removing fibrous tissue, and restoring mandibular function. Various surgical techniques including gap arthroplasty, interpositional

arthroplasty, and total joint replacement may be employed based on the severity of ankylosis and patient-specific factors.

### **Conclusion**

Extra-cranial TMJ ankylosis in pediatric patients presents unique diagnostic and therapeutic challenges. Early recognition and intervention are essential to prevent long-term complications and optimize mandibular function.

This case report underscores the importance of a comprehensive diagnostic workup and a multidisciplinary approach in the management of this rare condition.

### **References:**

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### **Consent**

Written informed consent was obtained from the patient's father for the publication of this case report with images attached.