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An interesting radiological picture of post traumatic TMJ ankylosis due to sagittal condylar fracture

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ABSTRACT

INTRODUCTION: In a condylar fracture whether to intervene or to go for conservative management still remains a dilemma. Studies and hypothesis suggests that it's medially dislocated condylar fracture segment that is more likely to ankylose, moreover no consensus have been put forth as to whether to remove the medially displaced fracture segment.

PRESENTATION OF CASE: The current article describes a case of unilateral temporomandibular joint (TMJ) ankylosis, which resulted as a sequlae from conservative management of a bilateral condylar fracture of which, the ankylosed side had a sagittal fracture of condyle. In our case the post trauma CT shows the lateral segment abutting with the arch and that the area has become ankylotic in a span of 2 years. Here we report a case of posttraumatic unilateral TMJ ankylosis resulting from closed reduction of a bilateral condylar fracture with interesting radiological findings.

DISCUSSION: We have tried to discuss a rather interesting radiological picture of posttraumatic TMJ ankylosis which resulted as a sequlae from conservative management of a bilateral condylar fracture.

CONCLUSION: The dilemma for a clinician as to whether to intervene in a condylar fracture or to go for conservative management still remains at large. As in this case the medial fracture segment was intact and the lateral segment was resulting in ankylosis.

1. Introduction

Temporomandibular joint (TMJ) ankylosis is a severe distressing pathology state, resulting in clinical impairment, with restricted jaw motion and subsequent limitation of related functions such as mastication, speech, and oral hygiene [1].

Trauma has been identified as the most common cause of TMJ ankylosis, and its severity is dependent mostly on age of the patient and also on type of trauma [2,3]. Local sites infections such as otitis media and mastoiditis, or systemic infections via haematogenous spread like tuberculosis, gonorrhoea, and scarlet Fever and Systemic diseases including ankylosing spondylitis, rheumatoid arthritis, and psoriasis are other aetiological factors causing TMJ ankylosis [3]. Studies have shown that condylar neck fractures are often associated with ankylosis, and the common finding of a medial projection of bone in TMJ ankylosis may be the remnants of a medially dislocated fractured condyloid process [4,5]. Ferretti et al. [2] in their study also advocated that medially dislocated condylar fracture has more chance of causing ankylosis of the TMJ. Sagittal fracture of the mandibular condyle (SFMC) is a vertical fracture involving condylar head and condylar capsule. In our case the medial segment was unresorbed and attached to the lateral segment of the condyle; which was involved in forming the ankylotic segment.

2. Presentation of case

A 40 year female patient reported to our department with restricted and gradually decreasing mouth opening over the past 2 years (Fig. 1). History revealed a case of bilateral condylar fracture with Lefort II and right side parasymphyseal mandibular fracture treated with closed reduction two years back and was put on intermaxillary fixation for a period of 6 weeks.

Fig. 2 is the OPG on presenting to our department, it shows left ankylotic mass with a displaced segment. Previous CT scan axial cut shows bilateral condylar fracture of which left condyle had sagittal fracture, and the lateral fracture segment of left condyle was seen abutting the zygomatic arch (Figs. 3 and 4).

As the patient had failed to undergo active physiotherapy, she had been experiencing a gradual decrease in mouth opening. Clinical examination revealed a minimal preoperative interincisal mouth opening. The present CT scan axial cut (Fig. 5) shows the left side ankylotic mass and in coronal view (Fig. 6) the unresorbed medial segment was seen attached to lateral segment. Three

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Fig. 1. Clinical picture of limited mouth opening.

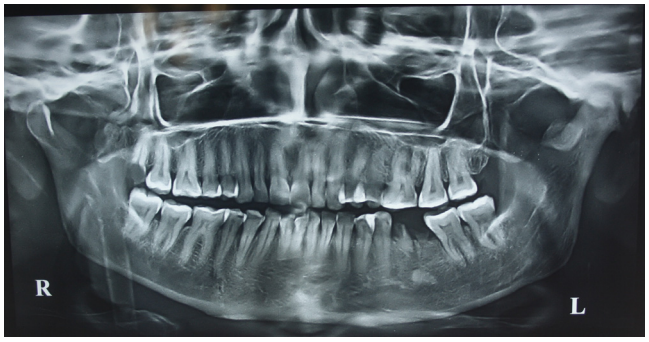

Fig. 2. OPG, 2 years post trauma, showing the left ankylotic mass and medially displaced segment.

Fig 3. Post trauma CT scan axial view showing bilateral condylar fracture, left condyle sagittal fracture evident.

dimensional CT scan also shows the left side ankylotic mass and confirms the presence of unresorbed medial segment attached to the lateral segment (Fig 7a,b).

As per new classification on Traumatic Temporomandibular Joint Ankylosis proposed by Dongmei et al. [6] based on coronal CT scan, there were 4 types of TMJ ankylosis (type A1 is fibrous ankylosis without bony fusion of the joint; type A2 is ankylosis with bony fusion on the lateral side of the joint, while the residual condyle fragment is bigger than 0.5 of the condylar head in the medial side; type A3 is similar to A2 but the residual condylar fragment is smaller than 0.5 of the condylar head; type A4 is ankylosis with complete bony fusion of the joint.)

Fig. 4. Another axial cut post trauma CT showing the lateral segment of sagittal fracture left condyle abutting the zygomatic arch.

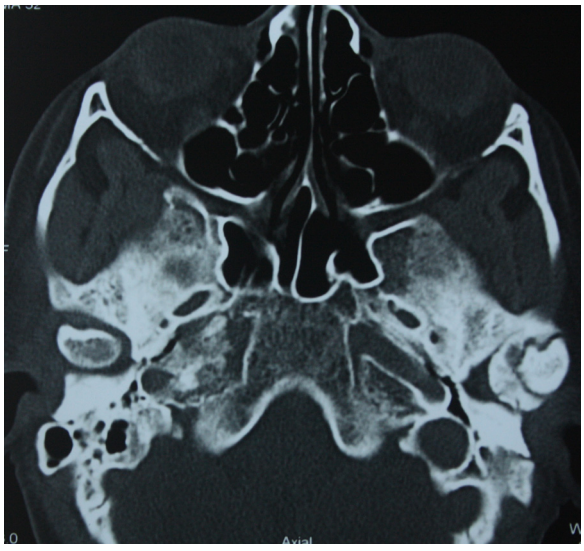

Fig. 5. The present CT scan axial cut showing the ankylotic mass on left side.

Fig. 6. Present coronal view showing ankylotic mass on left side and medial segment of sagittaly fractured left condyle.

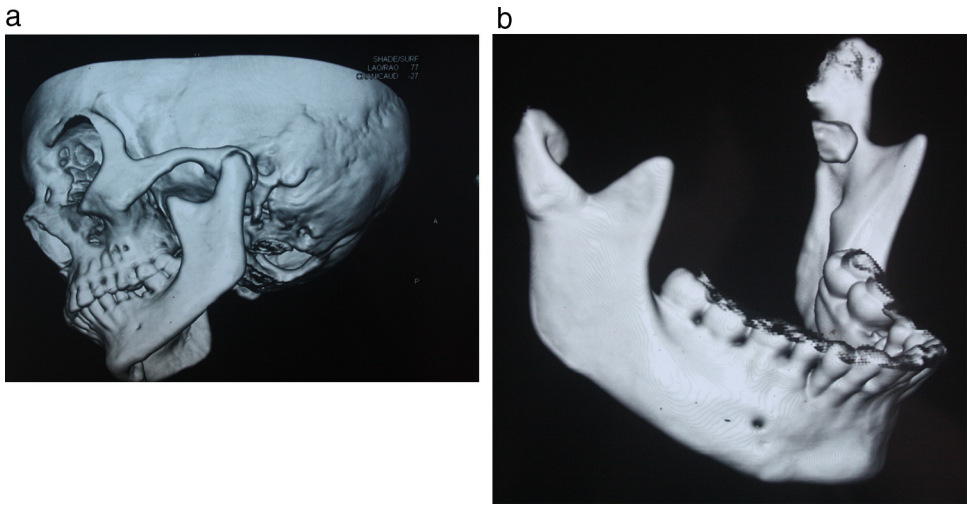

Fig. 7. a and b: 3 D CT showing ankylotic mass left side and the displaced medial segment, please note the irregular surface of left condyle.

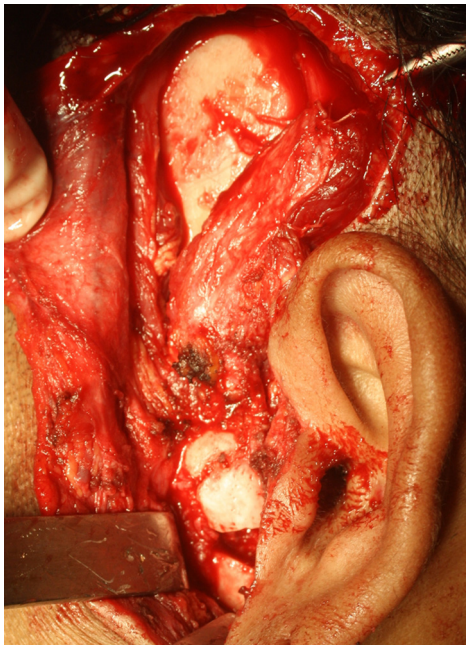

Fig. 8. Intraoperative view of the resected ankylotic segment and the raised temporalis myofacial flap.

Our case falls under type A2; that is ankylosis with bony fusion on the lateral side of the joint to zygomatic arch, while the residual condyle fragment is bigger than 0.5 of the condylar head in the medial side.

2.1. Surgical procedure

Surgical site was prepared on left temporal and preauricular region, safe and sufficient exposure of the ankylotic site was achieved by Al-Kayat and Bramley approach [7]. Ankylotic segment was identified and bony segment of 1.5 cm length was removed below the ankylotic segment (Fig. 8) creating pseudoarthrosis and leaving the ankylotic mass undisturbed as advocated by Salins [8]. Interoperative active mouth opening was made to 35 mm. Interpositional arthroplasty with temporalis myofacial flap was completed by suturing temporalis muscle with 3.0 vicryl medially. Haemostasis was achieved; closure was done in layers with 3.0 vicryl. Extra oral suturing was done using 3.0 prolene. Fig. 9 shows the

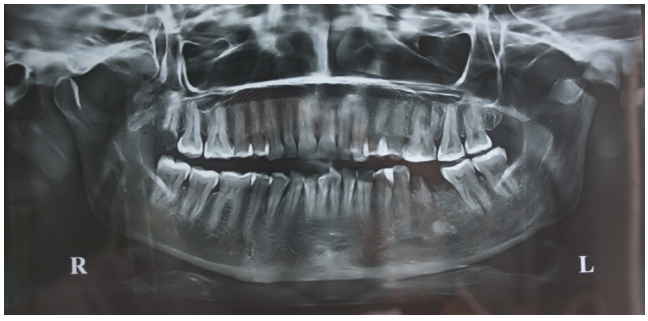

Fig. 9. Post operative OPG showing the resected ankylotic mass and medial segment is left insitu.

postoperative radiograph .Three year follow up phase till date was uneventful except for the initial transient temporary motor deficits to temporal, frontal branches and buccal branch of the facial nerve. Interincisal Mouth opening was maintained to 34 mm with active regular physiotherapy.

3. Discussion

Intracapsular fractures of the mandibular condyle are classified as type A, fractures through the medial condylar pole; type B, fractures through the lateral condylar pole with loss of vertical height of the mandibular ramus; or type M, multiple fragments, comminuted fractures [9]. Sagittal fracture of the mandibular condyle (SFMC), also known as type B fracture, happens frequently in facial trauma. Its fracture line begins from the lateral pole of the condylar surface to the medial side of the neck. The mandibular ramus height is shortened because the fragments are displaced medially anteriorly by lateral pterygoid muscle traction [9]. SFMCs were distinguished into type M (medial), type C (central), and type L (lateral) according the location of the fracture line within the sections [10].

Rowe [11] in 1982 reported that ankylosis can be a result of sagittal fracture of the condyle and in these cases the displacement of the lateral fragment upward over the outer rim of the glenoid fossa were seen in association with the displacement of the intraarticular disc, and the accompanying loss of mobility,

A strong relation between sagittal split condylar fractures and simultaneous mandibular fractures in the pathogenesis of ankylosis of the TMJ was described by He et al. [12] in 2008.

This mechanism increases the width between the condyles or rami at the level of the lateral segment. The fractured surface of

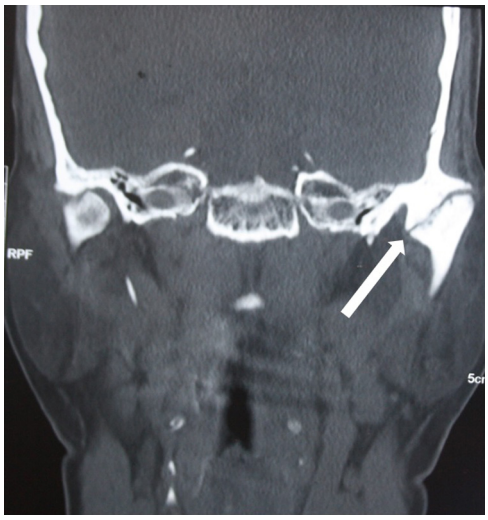

Fig. 10. Characteristic 'S' shape of glenoid fossa on affected condyle.

the ramus or lateral condylar pole displaces laterally and possibly superiorly to the glenoid fossa and comes into close contact with the zygomatic arch, which causes a juxta-articular type of ankylosis, that is the ankylosis occurs lateral to the articulation itself,a similar scenario was also seen in our case. We feel the proposed explanation for the fusion to the zygomatic arch could be that fractured sagittal part being cancellous is reshaped and gets fused to the arch.

An interesting finding which came to our attention from our literature review [6] was that the glenoid fossa of the affected condyle showed a characteristic 'S' shape and this feature was also evident in our case (Fig. 10). Recently, it has been postulated that distraction osteogenesis caused by traction of the lateral pterygoid muscle on the bone after sagittal fracture of the mandibular condyle is an important factor in the genesis of traumatic ankylosis of the TMJ [13]. This theory may be extrapolated to explain the fact that the medial segment did not resorb till date could be because of the vascularity maintained via the attachment to the lateral segment as seen in (Fig. 6).

The presence of ankylotic block is one of the few absolute indications for TMJ open surgery; moreover mouth opening is severely restricted in posttraumatic TMJ ankylosis [14]. Though as per protocol put forth by Dongmei et al. [6] "lateral arthroplasty" (LAP) is advised in cases for type A2 ankylosis, in our case interpositional arthroplasty with temporalis myofacial flap was done because in this case the bony fusion was seen involving both the glenoid fossa as well as the lateral side of joint.

According to Rowe [11] "reankylosis" is significantly less likely when interposition material is placed between the cut surfaces of the bone, thus evolved the technique of osteoarthrectomy or gap arthroplasty combined with an interpositional arthroplasty.

4. Conclusion

We have tried to discuss a rather interesting radiological picture of posttraumatic tmj ankylosis which resulted as a sequlae from conservative management of a bilateral condylar fracture, of which the ankylosed side had a sagittal fracture of the condyle. The dilemma for a clinician as to whether to intervene in a condylar fracture or to go for conservative management still remains at large. As in this case the medial fracture segment was intact and the lateral segment was resulting in ankylosis. Interpositional arthroplasty with temporalis myofacial flap is a good way to treat traumatic TMJ ankylosis when the medially displaced condylar head and disc are intact.

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