Journal of Oral Biology and Craniofacial Research 9 (2019) 218–221

Contents lists available at ScienceDirect

Journal of Oral Biology and Craniofacial Research

journal homepage: www.elsevier.com/locate/jobcr

Extensive temporomandibular joint ankylosis involving medial pterygoid plates and the maxillary tuberosity- a case report

Sujay M. Bhave, Divya Mehrotra*, Praveen Singh, Anand Shukla

Department of Oral and Maxillofacial Surgery, King George's Medical University, Lucknow, India

ARTICLE INFO

Keywords:
TMJ ankylosis
Temporomandibular joint
Skull base ankylosis

ABSTRACT

Background: Temporomandibular joint ankylosis is a distressing condition which leads to significant functional debility and facial blemish. It can be surgically managed with gap or interposition arthroplasty, with an objective to restore joint function and prevent re-ankylosis. Sometimes TMJ ankylosis can present with atypical presentations like skull base ankylosis. The main aim of this surgery is to successfully treat such conditions efficiently without any possible complications. However, surgical procedures for such atypical presentations in this disease are rarely reported.

Case summary: Here we report a 27 year old male with Left TMJ ankylosis involving the skull base. The patient presented with reduced mouth opening with a previous history of trauma. For treatment we performed a surgery by doing osteoarthrectomy with interpositional arthroplasty of left TMJ using piezosurgery. To our knowledge this is the only TMJ ankylosis case with involvement of bones of the skull base treated with piezosurgery. Intraoperatively we achieved a mouth opening of 30 mm, and postoperatively after 15 days mouth opening up to 30 mm was achived with physiotherapy.

Conclusion: Some times TMJ ankylosis can present with atypical presentations in which bones of the skull base are involved. These are very rare and could be termed as 'skull base ankylosis'. Such cases can be surgically challenging and some surgical treatment modalities like Computer Assisted Surgery (CAS), 3D Navigation and Piezo-electric surgery could be beneficial in avoiding complications and facilitating efficient treatment.

1. Introduction

Temporomandibular joint ankylosis is a distressing condition which leads to significant functional debility and facial blemish.[1] Undiagnosed/mismanaged trauma is the leading cause of ankylosis (92%), followed by infection (5%) and others (3%).[2] It can be surgically managed with gap or interposition arthroplasty, with an objective to restore joint function and prevent re-ankylosis.

1.1. Case report

A 27 year old male patient reported to the outpatient clinic of the Department of Oral and Maxillofacial surgery at King George's Medical University, Lucknow, India with a history of trauma due to a road traffic accident around 3 years back and a complaint of inability to open mouth. On clinical examination there was nil mouth opening and the temporomandibular joint movements were not palpable. There was no significant facial asymmetry and his occlusion was intact. (Fig. 1).

Radiographic examination with a non contrast computed tomography showed abnormal bony fusion between the medial aspect of the condyle and the medial and lateral pterygoid plates approaching the maxillary tuberosity on the left side. The bony chunk volume measured 4125 mm^3 based on computed tomography. The joint space seemed to be normal with an atypical presentation of the ankylotic mass presenting more medially, in close relation with the pterygopalatine fossa and the sphenoid bone (Fig. 2).

As the patient had no history of treatment related to any condylar fracture, suspected etiology was an undiagnosed medially displaced condylar fracture after trauma getting fused medially with the medial and lateral pterygoid plates.

* Corresponding author.
E-mail address: divyamehrotra@hotmail.com (D. Mehrotra).

https://doi.org/10.1016/j.jobcr.2019.05.002
Received 20 April 2019; Accepted 14 May 2019
Available online 15 May 2019

Fig. 1. Shows frontal (a), pre operative mouth opening (b), lateral profile views (c & d) and the pre operative occlusion (e) of the patient.

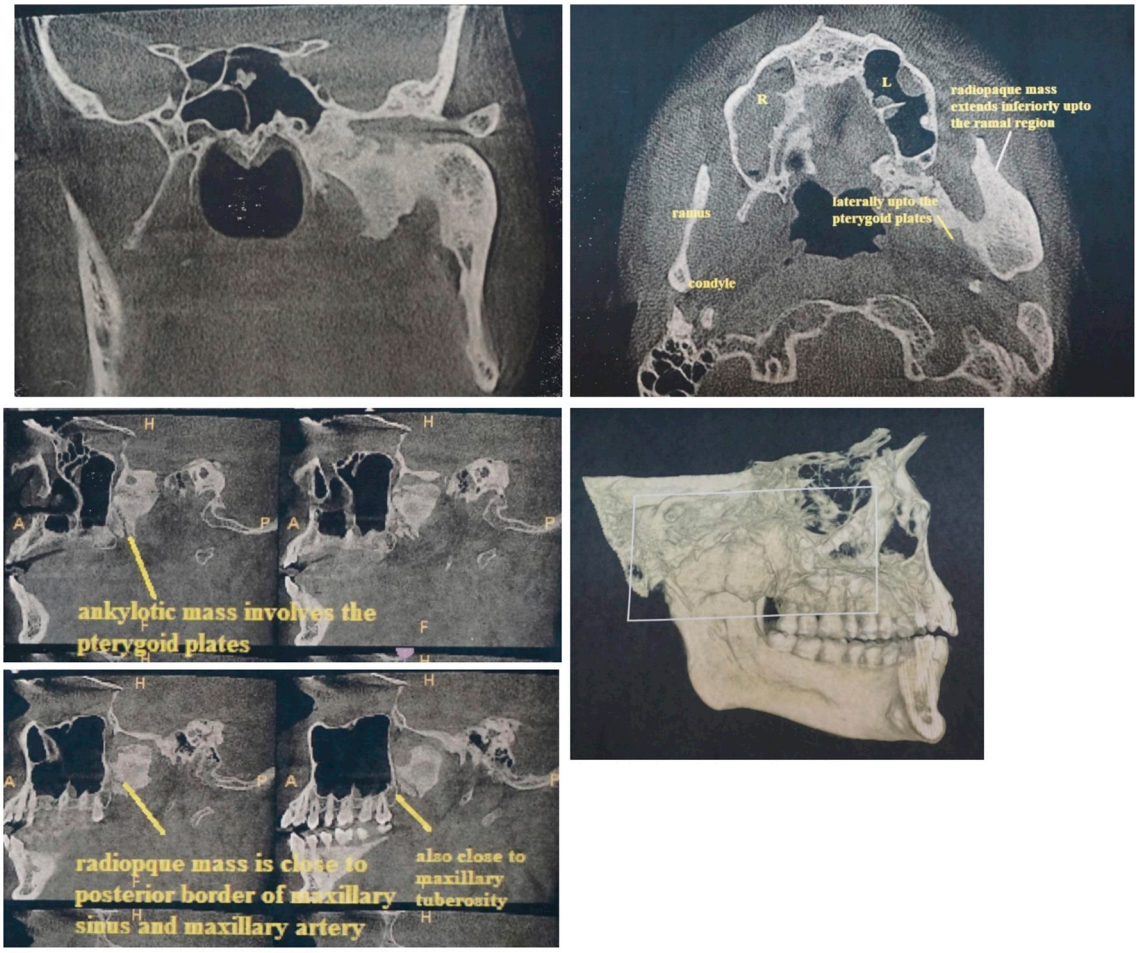

Fig. 2. Depicts the preoperative non-contrast CT images in coronal (a), axial (b), sagittal (c & d), and 3D sagittal cut sections (e).

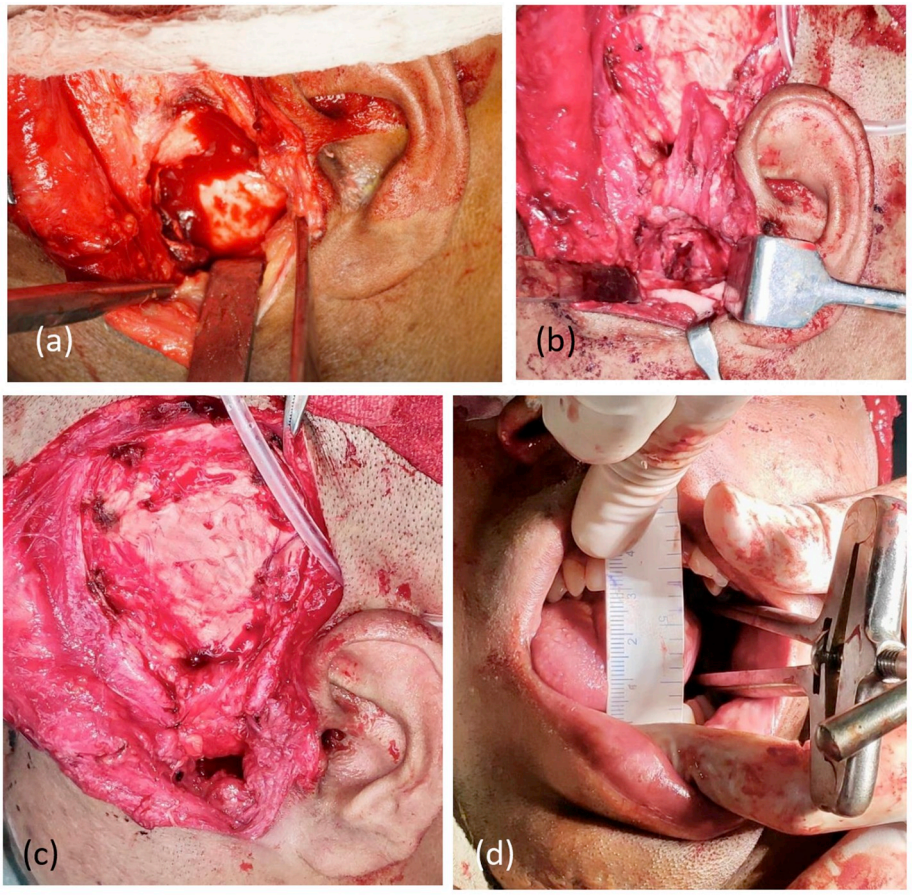

Fig. 3. Shows the exposed TMJ (a), osteo-arthrectomy (b), interposition using temporalis myofascia (c), and intraoperative mouth opening of 30 mm (d).

An interposition arthroplasty with temporal fascia interposition and ipsilateral coronoidectomy was planned under general anesthesia. Fiberoptic nasal endotracheal intubation was followed by part preparation and the patient was draped for surgery. Al Kayat and Bramley incision was used to expose the bony chunk extending up to the pterygoid plate and the osteotomy was marked with an oscillating saw. Excessive medial bony chunk was removed with the help of a surgical rose head bur. An intraoperative mouth opening of 30 mm was achieved (Fig. 3). Extensive postoperative physiotherapy was advised and a post operative mouth opening of 30 mm was achieved (Fig. 4).

2. Discussion

TMJ ankylosis is a common condition which involves fusion of the mandibular condyle and the glenoid fossa resulting in impaired mouth opening.

According to a radiography based study on post traumatic TMJ ankylosis, it can not only affect the glenoid fossa, mandible and its growth but also the bones on the skull base such as sphenoid or temporal bone.[3] They gave a new radiographic classification on TMJ ankylosis to include such extensive ankylosis cases (Table 1). Ferretti et al. found that a medially displaced condylar fracture had the largest incidence of TMJ ankylosis compared to other types of condylar fractures.[4]

The use of ultrasonic piezosurgery can be useful in preventing excessive bleeding during osteotomy of excessively deep bony ankylotic masses.[10] He et al. proposed the use of 3D navigation system to preserve the minimum permissible skull base thickness (> 3 mm) and can decrease the risk of complications such as intracranial perforation and iatrogenic brain injury.[11] Schmelzeisen et al. proposed the use of computer assisted surgery to promote safe resection of ankylosed skull base tissue.[12]

TMJ ankylosis normally involves the glenoid fossa and the mandibular condyle but the involvement of other bones in this disease is rare. Atypical presentations like zygomatico-coronoid ankylosis have also been documented in literature which involve fusion of the coronoid process with the zygomatic arch after a depressed zygomatic arch fracture or a coronoid process fracture.[5–9] But such atypical presentations in which bones of the skull base are involved are very rare and could be termed as ‘skull base ankylosis’. This case report is one of such atypical presentations in TMJ ankylosis documented in literature.

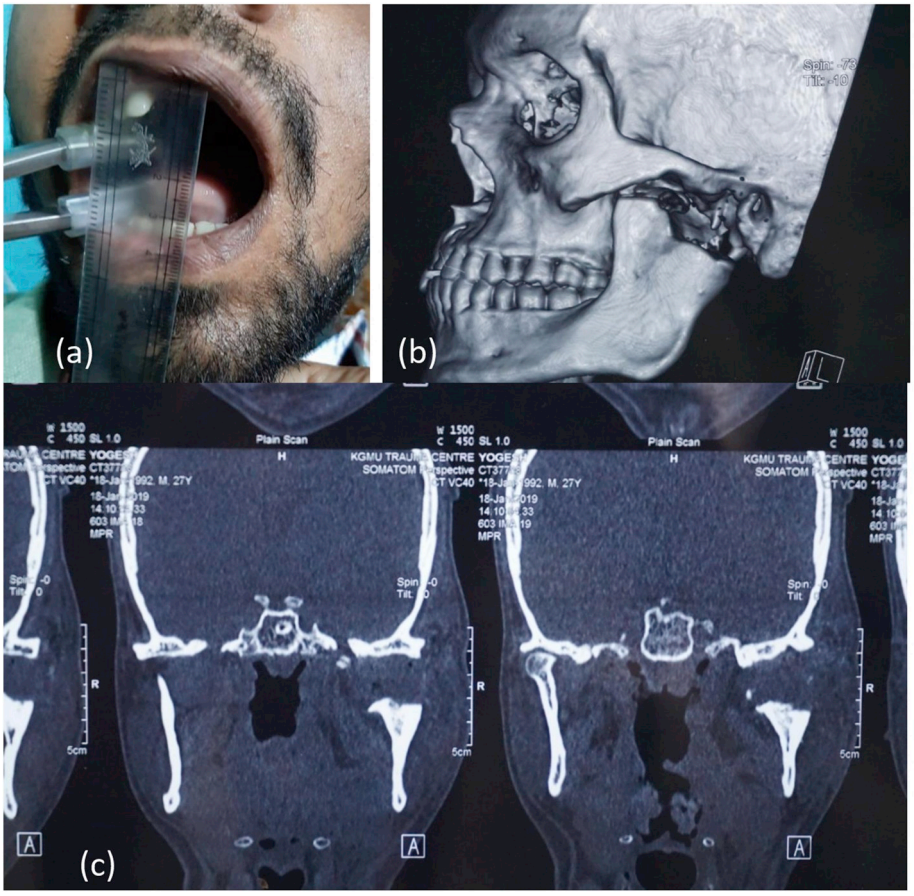

Fig. 4. Shows postoperative mouth opening after 15 days of mouth opening physiotherapy (a) show postoperative CT images in their 3D and Coronal sections respectively (b) and (c).

Table 1
Classification of TMJ ankylosis by IE El-Hakim and SA Metwalli(2002).

Class1	Includes unilateral and bilateral fibrous ankylosis. The condyle and glenoid fossa retain their original shape, and the maxillary artery is in normal anatomical relation to the ankylosed mass.
Class2	There is unilateral or bilateral bony fusion between the condyle and the temporal bone. The maxillary artery lies in normal anatomical relation to the ankylosed mass.
Class3	The distance between the maxillary artery and the medial pole of the mandibular condyle is less on the ankylosed than in the normal side or the maxillary artery runs within the ankylotic bony mass. This is best seen on coronal CT.
Class4	The ankylosed mass appeared fused to the base of the skull and there is extensive bone formation, especially from the medial aspect of the condyle to the extent that the ankylosed bony mass is in close relationship to the vital structures at the base of the skull such as the pterygoid plates, the carotid and jugular foramina and foramen spinosum and no joint anatomy can be defined from the radiograph. This is best visualized on axial CT.

Conflicts of interest

There is no conflict of interest.

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