

Surgical Management of Traumatic Temporomandibular Joint Ankylosis: A Case Report

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Abstract

The complex disorder known as temporomandibular joint ankylosis (TMJ) affects nutrition and jaw function. Treatment options for post-traumatic joint ankylosis include a range of surgical methods. But no common procedure can ensure a successful outcome devoid of symptoms. Thus, treating TMJ injuries following trauma continues to be a difficult challenge for oral and maxillofacial surgeons. This paper is a case of a post-traumatic TMJ ankylosis. The 31-year-old young man sustained from many facial bone fractures, including condyles, in a car accident seven years ago. The condyle being treated conservative and the maxillary and malar fractures and mandibular parasymphysis was, treated with mini bone plates in other institution 7 years ago. After the surgery, he began to observe a gradually reduced mouth opening,(10mm) and further physiotherapy exercises was unable to restore normal mouth opening of the jaw. Preoperative CT revealed unilateral bony ankylosis on the right side of TMJ. Conservative treatments failed to restore normal jaw movement. An arthroplasty was carried out. The follow-up course went smoothly, with a mouth opening of up to 35 mm.

Keywords: Temporomandibular joint, Gap arthroplasty and ankylosis

INTRODUCTION

Ankylosis of the temporomandibular joint (TMJ) is a debilitating disorder marked by a fusion of the mandibular condyle and the glenoid fossa, leading to either fibrous or bony adhesions. This fusion causes severe psychological distress, airway obstacles, speech difficulties, mastication issues, facial abnormalities, and impaired jaw movement.¹ Kaban states that the most prevalent cause is trauma (31–98%), which is followed by local or systemic infection (10–49%), and any systemic illness (10%).² An accurate diagnosis is required to evaluate TMJ ankylosis. This evaluation includes a clinical examination as well as a variety of imaging procedures, including computed tomography (CT) scans, magnetic resonance imaging, orthopantomograms, plain films, and three-dimensional reconstructions. Research has indicated that ankylosis is frequently related to condylar neck fractures. In TMJ ankylosis, a typical observation is a medial bone protrusion, which might represent the remains of a medially displaced fractured condyloid

process.^{4,5} In their research, Ferrettiet al.⁶ also supported the idea that a medially displaced condylar fracture increases the risk of developing a TMJ ankylosis. We present a case of Right side TMJ ankylosis.

PRESENTATION OF CASE

A 31-year-old male patient presented to the department of oral and maxillofacial surgery with limited mouth opening (9mm) that had steadily decreased over the previous five years Fig1 (A, B). He had many facial bone fractures, including condyles, in a car accident seven years ago. Fig (2, 3).The condyle being treated conservative and the maxillary and malar fractures and mandibular parasymphysis was, treated with mini bone plates in other institution 7 years ago. Fig (4) After the surgery, he began to observe a gradually reduced mouth opening, and further physiotherapy exercises was unable to restore normal mouth opening of the jaw. Preoperative CT revealed unilateral bony ankylosis on the right side of TMJ Fig (5, 6)



(A)



(B)

Fig.1 (A, B) Pre-operative mouth opening



Fig. 2 Post trauma CT scan coronal view showing bilateral condylar fracture and medially displaced



Fig.3 Post trauma CT scan axial view showing posterolateral wall fracture



Fig.4 OPG



Fig. 5 3D CT of facial bone showing right condyle abutting the zygomatic arch

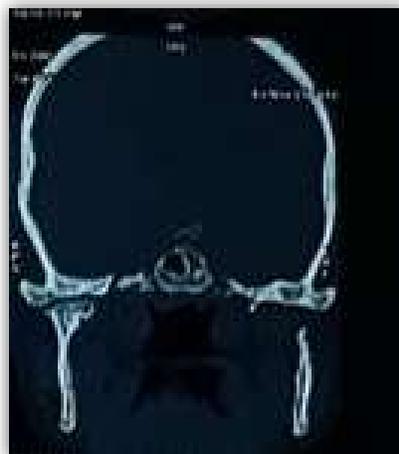


Fig.6 CT of facial bone shows right side bony ankylosis

SURGICAL PROCEDURE

The right temporal and preauricular area was selected as the surgical site. Painting was done with 5% povidone iodine. Zygomatic arch and superior temporal artery was palpated and natural skin fold was formed with digital pressure. Al-Kayat and Bramley incision was given Fig (7). Incision was given involving skin, subcutaneous tissue, and temporoparietal fascia with no 15 B.P blade and handle. Blunt dissection proceeds in this plane down to the temporal fascia's splitting point, which is located approximately 2 cm above the malar arch Fig (8). Fatty tissue is readily visible through the thin lateral layer and is found in the pocket formed by the division of temporal fascia. There should be no more attempts to separate the temporal fascia from the superficial fascia after this point. An incision into the superficial layer of the temporal fascia is made at a 45-degree angle both upward and forward, starting at the root of the malar arch. The periosteum of the malar arch can be safely cut inside this pocket and turned forward as a single flap together with the superficial fascia that contains the skin and nerves and the outer layer of temporal fascia. The pocket can extend anteriorly as far as the posterior border of the frontal process of the malar bone and it can be



Fig.7 Al-Kayat and Bramley incision

joined posteriorly to the preauricular dissection, which closely follows the cartilagenous external auditory canal beneath the parotid gland's glenoid lobe and the superficial temporal vessels. The tissues lateral to the joint capsule are dissected and retracted, proceeding downward from the articular fossa and lower edge of the arch. bony ankylotic mass exposed Fig (9). With small round, bur 3 stamp hole was made in ankylotic mass. With 702 taper fissure bur stamp hole was connected. With the help of chisel and mallet bony mass separated in upper and lower segment. With mastoid round bur in upper segment bony mass was reduced, and sharp bony margin was smoothed Fig (10). Gap was created equal on medial and lateral side. Active mouth opening was achieved of 35 mm Fig (12). Complete hemostasis was achieved and closure was done layer by layer.

After surgery, the patient was put on a nonchewing diet for two weeks before switching to a soft diet. On the fifth postoperative day, intensive physical therapy was started six times a day, and range of motion exercises were added using heister mouth gag and actively aided opening, which were continued for four months.



Fig.8 Intraoperative view showing superficial layer of deep temporal fascia



Fig.9 Intraoperative view of the ankylotic segment



Fig .10 Intraoperative view of the resected ankylotic segment

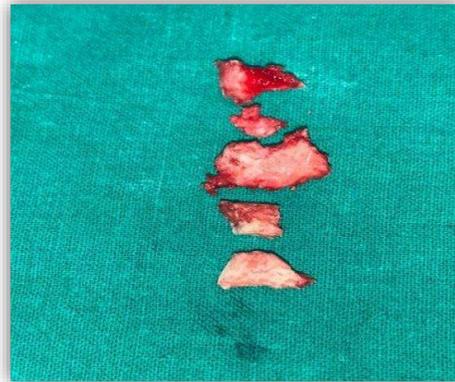


Fig.11 Resected ankylotic segment



Fig.12 Intra operative active mouth opening

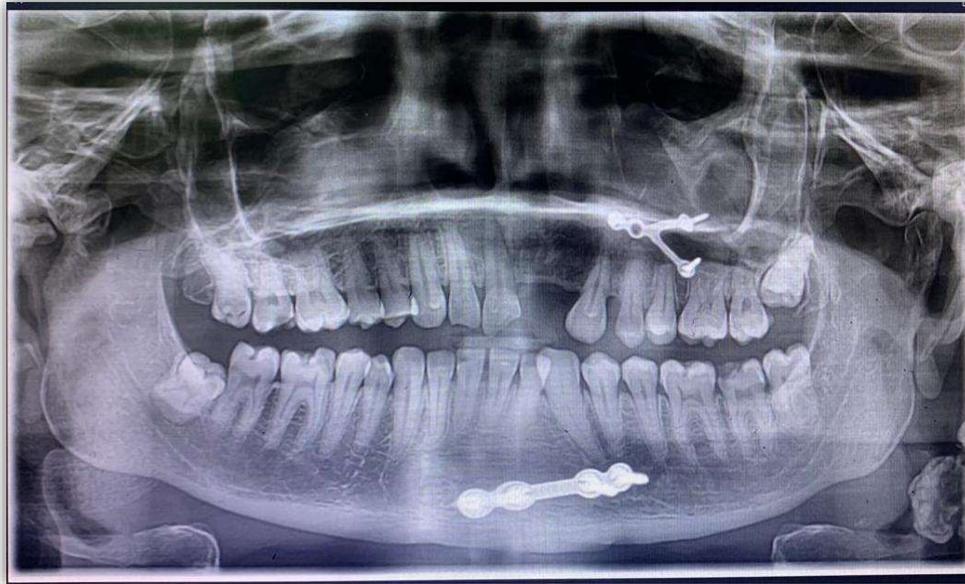


Fig.13 Post-operative OPG showing the resected ankylotic mass

DISCUSSION

TMJ ankylosis is most likely caused by a fracture in the condylar process. In 1982, Rowe⁷ reported that sagittal fractures of the condyle can cause ankylosis. The displacement of the intra-articular disc and the resulting loss of mobility were observed in conjunction with the upward displacement of the lateral fragment over the outer rim of the glenoid fossa. He et al. (2008) reported a significant relationship between simultaneous mandibular fractures and sagittal split condylar fractures in the pathophysiology of TMJ ankylosis⁸. Our opinion is that the proposed explanation for the fusion to the zygomatic arch could be that the fractured sagittal part being cancellous is reshaped and gets fused to the arch.

Additionally crucial to avoiding ankylosis recurrence is post-temporomandibular joint arthroplasty physiotherapy. In order to obtain satisfactory outcomes in terms of maximum mouth opening (MMO) and range of motion, De Méurechy and his colleagues designed a physiotherapeutic

strategy for functional rehabilitation⁹. As the most frequent side effect of TMJ surgery is re-ankylosis, a patient's step-by-step rehabilitation program involves jaw exercises as well as diet modifications to avoid TMJ re-ankylosis. Abboud et al., however compared two distinct physiotherapy regimens—gradual vs rapid rehabilitation—for TMJ arthroscopic procedures. Even though the two groups' follow-up results are comparable, the immediate rehabilitation groups had improved MMO and pain outcomes¹⁰. In our case, we encouraged the patient to begin early, intense full-range-of-motion physical therapy in order to stop adhesion reattachment. The goal of immediate physical physiotherapy is to create a healing environment that allows for unhindered condyle translation¹¹.

CONCLUSION

It seems that gap arthroplasty produced a steady result in terms of range of motion. To avoid recurrence, an early postoperative physical therapy program is essential

BIBLIOGRAPHY

1. Andrade N.N, Nerurkar S.A, Mathai P, Aggarwal N. Modified cut for gap arthroplasty in temporomandibular joint ankylosis. *Ann Maxillofac Surg* 2019;9(2):
2. Kaban LB, Perrott DH, Fisher K. A protocol for management of temporomandibular joint ankylosis. *J Oral Maxillofac Surg.*1990;48:1145–51.
3. G. Arakeri, A. Kusanal, G.A. Zaki, P.A. Brennan, Pathogenesis of post-traumatic ankylosis of the temporomandibular joint: a critical review, *Br. J. Oral Maxillo fac. Surg.* 50 (2012) 8–12.
4. D.M. Laskin, Role of the meniscus in the etiology of post traumatic temporomandibular joint ankylosis, *Int. J. Oral Surg.* 7 (1978) 340–345.
5. J.E. Norman, Ankylosis of the temporomandibular joint, *Aust. Dent. J.* 23(1978) 56–66
6. 6.C.Ferretti, R. Bryant, P. Becker, C. Lawrence, Temporomandibular joint morphology following post-traumatic ankylosis in 26 patients, *Int. J. OralMaxillofac. Surg.* 34 (2005) 376–381
7. Cornelius C.P, Audigé L, Kunz C, Rudderma R, Buitrago-Téllez C.H, Frodel J, Prein J. The comprehensive AOCMF classification system: mandible fractures-
8. Level 3 Tutorial. *Craniomaxillofacial Trauma Reconstr* 2014;7(Suppl 1):S031–43.
9. Rasse M. Diakapituläre frakturen der mandibula. eine neue operationsmethode und erste ergebnisse. *Z für Stomatol* (1984) 1993;90(8):413–28.
10. De Meurechy N.K.G, Loos P.J, Mommaerts M.Y. Postoperative physiotherapy after open temporomandibular joint surgery: a 3-Step program. *J Oral Maxillofac Surg* 2019;77(5):932–50.
11. De Meurechy N.K.G, Loos P.J, Mommaerts M.Y. Postoperative physiotherapy after open temporomandibular joint surgery: a 3-Step program. *J Oral Maxillofac Surg* 2019;77(5):932–50.
12. [11] Abboud W.A, Yarom N, Yahalom R, Joachim M, Reiter S, Koren O, Elishoov H. Comparison of two physiotherapy programmes for rehabilitation after
13. temporomandibular joint arthroscopy. *Int J Oral Maxillofac Surg* 2018;47(6):755