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Management of Ankylosing Spondylitis of the Temporomandibular Joint: A Case Report

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Abstract

Introduction: Temporomandibular Joint Ankylosis (TMJA) is characterized by the limited opening of the mouth. Ankylosing Spondylitis (AS) is a chronic inflammatory disease that affects the joints and bones. AS also affects the synovial and cartilaginous articularations and the sites of tendon and ligament attachment to bone. This case presents the management of a rare TMJA case which is a secondary manifestation of ankylosing spondylitis. Case: A 30-year-old male visited the Cipto Mangunkusumo hospital with the chief complaint that he had difficulties opening his mouth since 5 years ago. MRI examination showed bilateral fusion between the condyle and glenoid fossa. Bilateral interpositional temporal muscle graft arthroplasty, and bilateral coronoidectomy were performed. One month after surgery, the patient showed uneventful postoperative healing with an interincisal opening of 2.5 cm. Conclusion: Interpositional temporal muscle graft arthroplasty is the suitable treatment for TMJA secondary to ankylosing spondylitis.

Keyword: Temporomandibular Joint Ankylosis, Ankylosing Spondylitis, Interpositional Graft Arthroplasty.

Introduction

Temporomandibular joint ankylosis (TMJA), is characterized by the limited opening of the mouth. TMJA occurs due to fusion between the condyle and the glenoid fossa. The most common etiology of TMJA is trauma, especially condylar fracture. Furthermore, TMJA may induce distressing conditions, such as impaired speech, difficulty in chewing, poor oral hygiene, compromised airway and psychological stress.1,2

TMJ structures are mainly composed of fibrocartilagenous tissues, hence there is a tendency of involvement in ankylosing spondylitis (AS), similar to other structures such as the joints of the extremities or intervertebral discs. Despite the low
incidence of TMJ involvement (4%) in the USA.\(^1,3\) Patients with TMJA involvement were mostly reported to be males, below 50 years old and had peripheral joint diseases.\(^4\)

Involvement of the TMJ is often accompanied by severe symptoms until stiffness, pain and total restriction of jaw movement had occurred.\(^5\)

Various studies mentioned several treatment for TMJA with AS, such as gap arthroplasty, interpositional graft arthroplasty, and reconstruction with alloplastic material.\(^2,4,6,7\)

The aim of TMJA treatment lies in restoring the form and function of the joints, removal the ankylosic mass, achieve adequate mouth opening, and the greatest concern, to prevent recurrence. Sufficient perioperative management, and postoperative care remain the prime factors in increasing success rate of surgery.\(^1,5,8\)

This case report presents the management of bilateral TMJA with interpositional temporal muscle graft arthroplasty and coronoidectomy.

**Case Report**

A male patient, aged 25 years, was referred to the Department of Oral and Maxillofacial Surgery at Cipto Mangunkusumo Hospital for evaluation and treatment of bilateral TMJA. He visited with the chief complaint of not being able to open his mouth since 5 years ago. From the age of 12, the patient complained of stiffness and restricted movement of his neck, back and lower extremities. At the age of 20 years, the patient began to complain difficulties in opening his mouth, until his jaws were locked. The patient could only consume a liquid diet since then. Previously, the patient had planned to undergo a total hip replacement by an orthopaedic surgeon, however, due to the difficulty in intubation and nutritional intake, the patient was then advised to seek treatment for his jaws, beforehand. Extra oral examination showed no facial asymmetry, no swelling, and pain during palpation of the neck. Intraoral examination found no malocclusions. MRI examination showed fusion on both sides of the TMJ (Fig.1). The patient was diagnosed with bilateral TMJA and interpositional temporal muscle graft arthroplasty was planned as the definitive treatment.

Interpositional temporal muscle graft arthroplasty was conducted under general anesthesia. TMJ and cervical involvement in ankylosing spondylitis made tracheal intubation difficult. Furthermore, the anesthesiologist performed awake intubation using fiber optic device. In order to obtain visibility of the temporomandibular joint, Al-Kayat approach was used on both sides. After

![Figure 1. MRI examination (coronal view) showed fusion between condyle and glenoid fossa on both sides, (A) right; (B) left.](image)

![Figure 2. Interincisal distance during opening. (A) Preoperative evaluation, (B) after gap arthroplasty, (C) After coronoidectomy, (D) 1 week postoperative](image)
gap arthroplasty was only 15 mm. Due to limited mouth opening, coronoidectomy was decided on both sides. Coronoidectomy was then performed on the left side, hence increasing mouth opening to 25 mm. After coronoidectomy was completed on both sides, the final recorded mouth opening was 40 mm (Fig.2).

To prevent recurrence of ankylosis, temporal muscle graft arthroplasty was performed (Fig.3). Parallel incisions were made through the temporalis muscle. Commencing from the top edge of the temporalis muscle, the flap was raised down through the lateroposterior part of the zygomatic arch and covering the glenoid fossa. The flap was then sutured to the surrounding muscle and the muscle was attached to the glenoid fossa. A vacuum drain was placed and to prevent formation of dead space, the muscles were sutured layer by layer.

During post-operative evaluation, patient claimed to be satisfied with the surgery, and had no problem with chewing on medium-soft diet, however the patient still complained about pain in the neck. No abnormalities in the facial nerve was observed during examination. Recorded interincisal opening was 25 mm. Patient was referred for physiotherapy and had to undergo mouth opening physical therapy with occlusal guidance using rubber and archbar. Anti-inflammatory and muscle relaxant medications for secondary symptoms were provided to the patient. After two months follow up, the patient was consulted to an orthopaedic surgeon to discuss treatment of ankylosis in the hip and spine.

Discussion

Although various authors had stated that the mechanism of TMJ involvement in patients with AS was unclear; however, two possible mechanism exists that explains the pathogenesis of TMJ involvement in AS. First, the destruction of the disc or capsular attachment, resulting in subsequent degenerative joint diseases and internal derangement. Second, there could be a synovitis (rheumatoid arthritis) with direct breakdown of the articular surfaces which may lead to ankylosis. Immunological examination may prove to be useful for diagnosis of AS.3 Furthermore, immunological activity could also be determined by the presence of human leucocyte antigen (HLA-B27) in over 90% of patients with AS 1,2,5

A variety of techniques for the management of TMJA had been reported in many studies. These include gap arthroplasty, interpositional arthroplasty, subankylotic osteotomy with creation of a functional pseudoarthrosis and more recently, total reconstruction of TMJ with alloplastic graft.2,4,6,9 A coronoidectomy is only performed in cases of total TMJA where mouth opening following surgery on the ankylosed joint is inadequate.7 According to Gupta et al., and Bhrany et al., coronoidectomy could improve and stabilize interincisal mouth opening in patients with trismus and ankylosis. 10,11 Although there was limited mouth opening after gap arthroplasty, we observed increased distance during mouth opening after coronoidectomy was performed. We believed there were possible

Figure 3. The operational procedure of interpositional temporalis graft, this procedure was performed on both sides. (A) Al-Kayat incision design, (B) Fusion between condyle and glenoid fossa, (C) Design of temporalis muscle flap,(D) Interpositional temporalis muscle graft after gap arthroplasty.
muscle spasm or atrophy that occurred in the temporalis muscle after 5 years of being inactive.

The principal goal for treatment of TMJA is removal of the ankylotic mass, restoring the form and function of the joint, increase interincisal distance during mouth opening, and prevention of recurrence. One week after surgery, the recorded interincisal mouth opening of the patient was 2.5 cm, This distance was smaller compared to the value recorded intra-operatively, which was approximately 4 cm, This difference was probably caused by muscle relaxants used intra-operatively which caused spasm of the masticatory muscles.

The most common symptoms of TMJ secondary to AS were muscle spasm, pain, and postural imbalance. Multidisciplinary treatment may involve many specialists from various fields. Specific AS exercise program may be recommended through physiotherapy, this is necessary in helping to maintain posture and prevent fusion of the joint. Anti-inflammatory and muscle relaxant medications are still a major part of symptomatic treatment.

The difficulty of the TMJA surgery lies in the intubation procedure and obtaining approach to the joint. A fibreoptic guided awake nasal intubation is a more safer and recommended technique compared to tracheostomy or classical blind awake nasal intubation technique. Approach to the joint is often obtained through important anatomical structures. The risk of complications includes facial nerve damage, scar formation, and perforation in the external auditory meatus. However, the most detrimental complication for this treatment were perforation of the middle cranial fossa and bleeding from the temporalis artery.

**Conclusion**

Ankylosing spondylitis of the temporomandibular joint is a challenging problem for both the oral and maxillofacial surgeon and patient. Over decades, "trial and error" and fundamental principles of TMJA surgery had aided the evolution of techniques that were used to correct this problem. This case report had described a useful technique in treating patients with TMJA secondary to AS.

**Reference**
