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Case Report: Temporomandibular Joint (TMJ) Ankylosis in a 10 year old Patient .

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Abstract

Unilateral temporomandibular joint (TMJ) ankylosis is a rare condition that can cause significant functional impairment and facial asymmetry. This case report describes the diagnosis and management of a 10-year-old patient with unilateral left TMJ ankylosis.

Introduction

Temporomandibular joint (TMJ) ankylosis is a rare and debilitating condition characterized by the fusion of the mandibular condyle to the temporal bone, resulting in limited mouth opening and significant functional impairment.[1] Unilateral TMJ ankylosis, where the condition affects only one joint, can cause facial asymmetry, deviation of the mandible, and difficulties with eating, speaking, and maintaining oral hygiene. Unilateral left TMJ ankylosis, in particular, poses unique challenges in terms of diagnosis and management, requiring a comprehensive treatment approach to address the functional and aesthetic implications of the condition. This case report describes the diagnosis and management of a 10-year-old patient with unilateral left TMJ ankylosis, highlighting the importance of prompt and effective treatment in improving functional outcomes and quality of life.[2]

This report covers the surgical treatment, clinical course, and morphological characteristics of Unilateral left temporomandibular joint (TMJ) ankylosis of a 10-year-old patient.

CASE PRESENTATION

A 10 year-old female patient was sent to our Department of Oral and Maxillofacial Surgery to the outpatient clinic with a history of progressive difficulty in mouth opening, inability to chew properly, and a noticeable facial asymmetry. The patient's parents reported that the symptoms had gradually worsened over the past six months, with a more marked restriction in jaw movement. The child had sustained a traumatic facial injury in a motor vehicle accident one year prior. Initially, the injury was thought to be minor, as there was no immediate complication or severe pain. However, over time, the patient began to experience discomfort and noticeable jaw stiffness.

On further questioning, the parents noted that their son had been unable to consume solid foods and relied on a liquid diet. They also observed changes in her speech, with difficulty pronouncing certain words clearly. There was no history of prior surgeries, infections, or systemic conditions that could have contributed to her symptoms.

Figure 1 Extraoral photograph showing deviation (right side of image)

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Medical History

The patient's medical history was otherwise unremarkable. The child was healthy, with no history of significant illnesses or surgeries. Immunization and developmental milestones were normal. However, the child had suffered a mild facial injury as a result of the motor vehicle accident. The injury involved a direct impact to the left side of the face, resulting in soft tissue trauma but no fractures initially noted on radiographic examination. The patient had been managed conservatively with observation, and the immediate post-trauma recovery was uneventful. However, in the subsequent months, the patient developed progressive limitations in mouth opening, which worsened in the months leading up to her presentation at the clinic.

Clinical Examination

On physical examination, the patient appeared well-nourished but had noticeable facial asymmetry. There was a deviation of the mandible to the left side during mouth opening, suggesting involvement of the left temporomandibular joint. The most striking finding was the limitation in mouth opening, with a maximum interincisal opening of approximately 10 mm. There was no obvious swelling or tenderness in the perioral or cervical regions.[4]

Palpation of the temporomandibular joint on the left side revealed tenderness, and a reduced range of motion. The right TMJ was unaffected and exhibited normal function w ithout tenderness or discomfort. There was no history of ear pain, tinnitus, or hearing loss to suggest additional involvement of the surrounding structures. The patient had difficulty articulating speech clearly due to the limited jaw movement, but the tongue and soft palate appeared intact.[10]

Radiographic Investigations

To further evaluate the extent of the TMJ involvement, radiographic imaging was performed. A panoramic X-ray revealed a marked reduction in the normal joint space on the left side, with a bony fusion between the mandibular condyle and the glenoid fossa. A computed tomography (CT) scan confirmed the diagnosis of complete bony ankylosis of the left temporomandibular joint. The condylar head and the fossa were fused, with loss of the normal anatomical features and joint movement. No other abnormalities were noted in the surrounding structures.

The right temporomandibular joint appeared to be intact, with no signs of ankylosis or damage. There were no signs of acute infections or systemic bone conditions, ruling out other potential causes of the symptoms.

figure 2 pre operative radiograph

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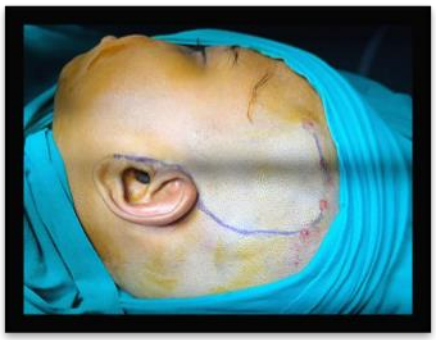
Diagnosis

Based on the clinical findings and radiological evidence, the diagnosis of unilateral TMJ ankylosis secondary to trauma was established. The traumatic event, which occurred a year prior, likely initiated the process of bony fusion, even though the patient had initially shown no significant signs of joint dysfunction following the injury.

Surgical Management

Given the severity of the temporomandibular joint (TMJ) ankylosis in the 10-year-old male patient, a comprehensive surgical approach was necessary to restore jaw function and prevent re-ankylosis. The goal of the surgery was to release the bony fusion, address any associated structural issues, and create a functional joint space that would allow for normal mouth opening and mastication. The surgery was performed under general anesthesia (GA), and a staged procedure was followed.[3]



1. **Release of Ankylotic Fusion (Osteotomy of the Ankylotic Chunk)**

Once the patient was under general anesthesia, a preauricular incision was made to expose the TMJ and the affected anatomical structures. The area was carefully dissected to avoid injury to nearby neurovascular structures. The ankylotic mass, consisting of bony fusion between the mandibular condyle and the glenoid fossa, was identified. This fusion was the result of progressive ankylosis following the trauma.[5]

An osteotome was used to carefully separate the bony ankylotic chunk from both the mandibular condyle and the glenoid fossa. The ankylotic mass was osteotomized in a controlled manner to avoid damage to the surrounding joint structures, particularly the articular disc and surrounding muscles. The excised ankylotic chunk was then removed completely, which effectively re-established a functional joint space.[15]

The goal of this step was to release the bony fusion and restore mobility to the joint while preserving the anatomical integrity of the remaining structures, particularly on the unaffected side.

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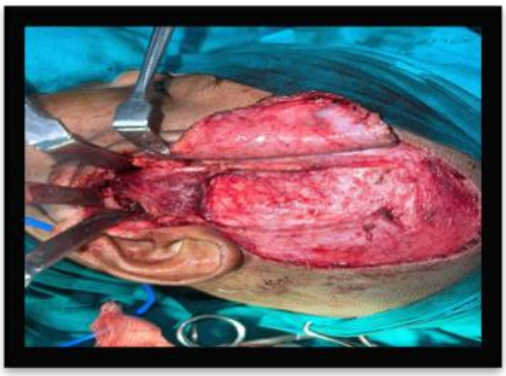
2. **Left-Side Coronoidectomy**

After the ankylotic mass was removed, attention was turned to the coronoid process of the mandible, which was involved in the patient's reduced mouth opening. The coronoid process is the bony projection from the mandible where the temporalis muscle attaches. In cases of TMJ ankylosis, the coronoid process can become hypertrophied or malformed, exacerbating the restriction of jaw movement.

A left-side coronoidectomy was performed to reduce this anatomical obstruction. The coronoidectomy involved removing part or all of the coronoid process that was limiting the patient's ability to open the mouth. By excising this bony structure, the surgeon ensured that there would be no physical barrier to full mouth opening, thus preventing further mechanical restriction of the temporomandibular joint.[9]

The coronoidectomy was done carefully to avoid damaging the surrounding tissues, particularly the temporalis muscle, which was crucial for the next step in the surgical process.



3. **Temporalis Myocutaneous Flap as Interpositional Material**

One of the key steps in preventing re-ankylosis following the release of the bony fusion is the use of interpositional material to prevent the joint surfaces from fusing again. In this case, a temporalis myocutaneous flap was selected as the interpositional material.

The temporalis myocutaneous flap is a viable and commonly used option in TMJ surgeries because of its rich vascular supply and its ability to provide an adequate barrier between the mandible and the skull base. To create the flap, the surgeon first identified and elevated the temporalis muscle along with a portion of the overlying skin (myocutaneous flap). The temporalis muscle, which originates from the temporal fossa of the skull, is dissected with its vascular pedicle intact. This ensures that the flap will remain viable and able to promote healing.[11]

Once elevated, the temporalis flap was positioned between the mandibular condyle and the glenoid fossa. This flap served as a biological barrier to prevent the formation of a new bony fusion between the two joint surfaces.[12] Additionally, the temporalis muscle and overlying tissue helped to provide soft tissue coverage and support for the joint, which also contributed to the recovery of normal joint function. The flap was secured in place with sutures to ensure that it remained positioned between the joint components during the healing phase.

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4. **Postoperative Considerations and Rehabilitation**

After the interpositional flap was secured and the surgical site was thoroughly irrigated, the incision was closed in layers. The patient was then placed in a soft diet for six weeks to minimize strain on the healing joint and interpositional material. Given the young age of the patient, post-operative physical therapy was an integral part of the recovery process.

The goal of the therapy was to encourage gradual, gentle movements of the jaw, prevent any scarring or fibrosis, and ensure that the temporalis myocutaneous flap remained effective in preventing re-ankylosis. A program of passive and active jaw exercises was started early in the postoperative phase to help achieve a normal range of motion and to avoid the recurrence of any restrictions in mouth opening.[7]

The patient was closely monitored for any signs of infection, re-ankylosis, or other complications. Pain was managed with anti-inflammatory medications, and any issues with swelling or infection were addressed promptly. The patient's follow-up visits included radiographic monitoring to ensure that the temporalis flap remained in place and that the joint space remained clear of any new fusion.[13]

Post operative radiograph

DISCUSSION

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TMJ ankylosis in children can have a devastating impact on both function and appearance. Early intervention is critical to ensure that growth and development of the craniofacial structures proceed without hindrance. In this case, the ankylosis developed as a result of trauma to the left TMJ, but the patient's delay in seeking medical attention following the initial injury led to progressive joint stiffness and functional impairment.[6]

The surgical approach used in this case, consisting of a combination of arthroplasty and interpositional grafting, is effective in preventing re-ankylosis while preserving joint function. Various techniques can be employed, including the use of temporalis fascia, muscle flaps, or synthetic materials, depending on the individual needs of the patient.[8]

Postoperative rehabilitation plays a crucial role in the recovery process. Physical therapy aimed at promoting jaw movement and preventing fibrosis is essential for achieving optimal results. The outcomes of this case highlight the importance of early diagnosis, appropriate surgical management, and comprehensive postoperative care in managing TMJ ankylosis in pediatric patients.[14]

Conclusion

This comprehensive surgical approach to TMJ ankylosis involved the careful removal of the ankylotic chunk using an osteotome, resection of the left-side coronoid process to eliminate any further mechanical barriers to mouth opening, and the use of a temporalis myocutaneous flap as interpositional material to prevent re-ankylosis. These steps together helped to restore normal joint function and significantly improved the patient's quality of life. The outcome of this case highlights the importance of a detailed and tailored surgical plan for pediatric patients with TMJ ankylosis, as well as the need for ongoing rehabilitation to ensure optimal functional recovery.

TMJ ankylosis is a challenging condition that can result in severe functional and aesthetic consequences if not treated in a timely manner. This case illustrates the successful management of unilateral TMJ ankylosis in a pediatric patient following a traumatic injury. Through prompt diagnosis, surgical intervention, and rehabilitation, the patient was able to regain normal function and improve her quality of life. The case underscores the need for early intervention and multidisciplinary care to address this condition effectively in children.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Keywords

Temporomandibular joint, ankylosis, trauma, pediatric, surgical management, mouth opening, facial asymmetry.

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