TMJ ANKYLOSIS – A OVERVIEW

Mohd Adhnan MF1*, Mohammed Junab Khan2, Mohammed Zaki Lohar3, Irfan Ashraf Baba4, Abdul Shahid Khan5, Nishat Anjum6

1MDS, Opposite Gajanan Mandir, Nagpur road, Chandrapur, India
2MD, Shishu Hospital, Opposite Zilla Parishad, Chandrapur, India
3MDS, Royal Multi-Speciality Dental Clinic & Implant Centre, Royal Touch Complex, Ganesh Peth, Hubli, Karnataka, India
4MDS, Registrar, Department Of Oral Medicine And Radiology, Government Dental College And Hospital Srinagar, Kashmir, India
5MDS, House no 2, Shakti Ward, Kawardha, Chattisgarh, India
6MDS, Opposite Gajanan Mandir, Nagpur road, Chandrapur, India

Received 29-10-2014; Revised 26-11-2014; Accepted 23-12-2014

*Corresponding Author: Mohd Adhnan
Opposite Gajanan Mandir Nagpur road, Chandrapur, India, Ph No- 918698452246

ABSTRACT

Ankylosis is a greek terminology meaning stiff joint. It can be defined as “inability to open due to either a fibrous or bony union between the head of the condyle and the glenoid fossa”. Surgical treatment procedures include arthroplasty of the joint cavity with or without a reconstruction and a coronoidectomy, an autogenous costochondral rib graft, distraction osteogenesis and intensive mouth-opening exercise, corrective orthognathic surgery or alloplastic joint prostheses. The authors have concluded that in order to achieve a satisfactory and durable effective treatment, an individualized approach is necessary in each case.

Keywords: Temporomandibular joint (TMJ), Arthroplasty.

INTRODUCTION

The TMJ is a ginglymoarthrodial joint, the most important functions of the temporomandibular joint (TMJ) are mastication and speech1. Temporomandibular disorder is a generic term used for any problem concerning the jaw joint. Among these disorders ankylosis is one of the most debilitating condition2.

Ankylosis is a Greek terminology meaning stiff joint. It can be defined as “inability to open due to either a fibrous or bony union between the head of the condyle and the glenoid fossa”3,4. It causes problems in mastication, digestion, speech, function, cosmesis, and maintenance of oral hygiene. It can also cause disturbances of facial growth and acute compromise of the airway, which invariably results in physical and psychological disability5.

CLASSIFICATION

Temporo-mandibular joint ankylosis may be classified by a combination of location (intra or extra articular), type of tissue involved (bony, fibrous, or fibroossseous) and extent of fusion (complete or incomplete). Kazanjian (1955) classified ankylosis as true and false. Any condition that gives rise to osseous or fibrous adhesion between the surfaces of the temporomandibular joint is a true ankylosis. False ankylosis results from pathological conditions not directly related to the joint5,6.

Taking into account the degree of TMJ mobility limitation, Sawhney divided TMJ ankylosis into 4 types6,7:

Type I: The head of the condylar process is visible but significantly deformed, with the fibroadhesions making TMJ movement impossible.

Type II: Consolidation of the deformed head of the condylar process and articular surface occurs mostly at the edges and in the anterior and posterior parts of the structures, and the medial part of the surface of the condylar head remain undamaged.

Type III: The ankylosic mass involves the mandibular ramus and zygomatic arch; an atrophic and displaced fragment of the anterior part of the condylar head is in a medial location.

Type IV: TMJ is completely obliterated by bony ankylosic mass growing between the mandibular ramus and cranial base.

Imaging of TMJ ankylosis-A new radiographic classification

- Class I: fibrous ankylosis. The condyle and glenoid fossa in original shape, and the maxillary artery in normal anatomical relation to the ankylosed mass
- Class II: bony fusion of condyle and the temporal bone. The maxillary artery in normal anatomical relation
- Class III: the distance between the maxillary artery and the medial pole of the mandibular condyle is less than on normal side or the maxillary artery runs within the ankylosic bony mass.
- Class IV: the ankylosed mass fused to the base of the skull and extensive bone formation, closely related to the vital structures such as the pterygoid plates, the carotid...
and jugular foramina and foramen spinosum and complete loss of joint anatomy.

**CAUSES AND PATHOGENESIS**

TMJ Ankylosis usually results from injury (13–100%); local or systemic infection (10–40%); or systemic disease (10%) such as ankylosing spondylitis, rheumatoid arthritis, and psoriasis; but can also result from operation on the TMJ. Other etiological factors are: myositis ossificans, osteochondroma, rheumatoid arthritis, ankylosing spondylitis (Bechterew Disease), psoriatic arthritis, systemic lupus erythematosus, radiotherapy or surgical treatment of TMJ. TMJ ankylosis has been identified as a complication after orthognathic surgery. Other blood into the joint, along with the disruption of fibrocartilage process is not diagnosed and/or not treated may result in TMJ ankylosis developed in childhood leads to mandibular profile of the affected patient is often described as “bird beaking”. The lower face is considerably shortened, the deficient mandible is visibly retruded and lacks the chin. In cases of unilateral ankylosis the face is asymmetric with the chin significantly deviated to the affected side, flatness on the unaffected side and roundness and fullness on the affected side. Lip incompetence, with the lower lip trapped under the maxillary front teeth. A prolonged ankylosis leads to muscle atrophy. Secondary elongation and hypertrophy of coronoid process subsequently results in limited mandibular mobility. The lower border showed a characteristic concavity ending in a well-defined antegonial notch; invariably, the angle had a spike of bone. Little or no deformities seen when intracapsular ankylosis occurs after the mandible had reached its full development.

**MECHANISM FOR ANTEGONIAL NOTCH**

Because of a failure of growth at the condyle, forward and downward movement of the body of the mandible does not occur, and a localised thickening of the bone at the angle accentuates the antegonion. This, coupled with the obtuse angle formed between the cranial base and the lower border of the mandible, is responsible for the characteristic “warping”.

**TREATMENT**

Temporomandibular joint ankylosis presents a serious problem for airway access. All patients were managed surgically under general anesthesia using fiber-optic nasotracheal intubation. The current protocol for surgical correction is to operate when the ankylosis is recognized regardless of the age of the patient. Incision for TMJ are,

1. Pre-auricular incision
2. Modified Blair’s incision
3. Al Kayat & Bramley incision
4. Popovich modification of Al Kayat & Bramley incision
5. Post auricular incision
6. Endaural incision
7. Circum-meatlal incision
8. Hemicoronal incision
9. Bicoronal incision
10. Intraoral approach

Al-Kayat Bramley incision over other pre-auricular incisions because of following advantages of Al-Kayat Bramley incision minimal bleeding and less sensory loss, easily identified fascial planes, excellent visibility, avoidance of muscle herniation and fibrosis, little post-operative discomfort or swelling, good cosmetic result achieved and easily teachable and speedy executed technique.

The surgical treatment procedures include:

1) Arthroplasty of the joint cavity;
2) Arthroplasty and a free costochondral graft
3) Arthroplasty with temporals myofascial flap insertion in the newly created joint cavity accompanied by a simultaneous unilateral coronoidectomy on the affected side or a bilateral coronoidectomy;
4) Distraction of the ramus and body of the mandible on the affected side;
5) Reconstruction of the joint using an alloplastic prosthesis
6) Arthroscopic laser-assisted preparation of the articular surfaces.
7. Postoperative radiotherapy
8. Bilateral arthrotyomy.

A necessary complement of the surgical treatment is physiotherapy (intensive mouth-opening exercise). According to Kaban et al. The advantages of gap arthroplasty are its simplicity and short operating time and the disadvantages include:

1. Creation of a pseudoarticular and a short ramus;
2. Failure to remove all the bony pathology, and
3. Increased risk of reankylosis.

No ideal interpositional graft is available because the problems encountered with the various available materials are biologic compatibility, and its capacity to remodel into a neocondyle with time. Its major drawbacks are donor site morbidity and reported unpredictable growth.

The benefits of a CCG include its growth potential, its biologic compatibility, and its capacity to remodel into a neocondyle with time. Its major drawbacks are donor site morbidity and reported unpredictable growth.

The BPF is a readily accessible mass of adipose tissue in the oromaxillofacial region. It is a specialized type of fat termed the TMJ. And it can be used as a pedicled or random fat flap with its own blood supply.

Disadvantages of alloplastic materials are wear at the joint surfaces, foreign body reaction, mobility of the implant with displacement, and implant fracture.

CONCLUSION

Until now no single standard treatment protocol for temporomandibular joint ankylosis has been reported. The failure rate (determined as reankylosis) still remains high. If a limited incisal opening, chin deviation or facial deformities are also considered to be failures, the percentage is even higher. Each method of TMJ reconstruction requires aggressive excision of the fibrous and bony pathological tissue causing ankylosis.

ACKNOWLEDGEMENT

The author is very much thankful to Dr Asif Karigar for their kind support.

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Source of support: Nil, Conflict of interest: None Declared