Case Report

Distraction Osteogenesis, A New Hope For Tmj Ankylosis

Dr. Amarnath.B.C. M.D.S*, Dr. Dharma R.M., M.D.S**, Dr. Prashanth C.S., M.D.S*** Dr. Rajkumar G.C., M.D.S#

*Professor, **Professor, ***Professor, D.A.P.M.R.V. Dental College, Bangalore. #Professor, Oral and Maxillofacial Surgery, V.S. Dental College

ABSTRACT

This case report presents the results of extraoral mandibular distraction osteogenesis and gap arthroplasty in a patient with bilateral temporomandibular joint bony ankylosis. Distraction osteogenesis with gap arthroplasty proved successful in this patient with follow-up of longer than 2 years.

Keywords: Distraction Osteogenesis, TMJ ankylosis, Gap Arthroplasty

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INTRODUCTION

Ankylosis of the TMJ is a common pathology affecting the facial skeleton, which often gets overlooked during younger age, thereby creating a more complex situation making it difficult to manage during the later years of life. The treatment of the sequelae of bilateral temporomandibular ankylosis is difficult, because these patients present with significant micrognathia, and it is impossible to use the conventional techniques for mandibular augmentation. The latest technique for combating the same is “Distraction Osteogenesis”. Distraction
techniques have been used in the facial bone area for the past 10 years.\textsuperscript{1,2}

Distraction osteogenesis (DO) is a biologic process of new bone formation by gradual traction of a fracture callus formed between osteotomised bone segments.\textsuperscript{3-5}

Bone lengthening by osteotomy and distraction osteogenesis of long bones was first described by Codivilla\textsuperscript{6} and later popularized by Ilizarov.\textsuperscript{7} DO has been applied to the craniofacial region since McCarthy et al reported the first clinical application of the technique in the treatment of four children with either unilateral or bilateral mandibular hypoplasia.\textsuperscript{8}

This case report describes a 16 yr old male patient with bilateral TMJ ankylosis and severe bilateral mandibular hypoplasia. Orthodontic treatment in combination with gap arthroplasty and distraction osteogenesis was carried out.

**CASE REPORT**

The patient, a 16 yr old boy, reported to the Department of Orthodontics and Dentofacial Orthopaedics with the chief complaint of an inability to open the mouth. Thorough clinical examination revealed the cause as bilateral TMJ ankylosis. The patient had a convex profile, recessive chin and high clinical FMA. (Fig 1)

On intraoral examination, Cl I molar relation was noted bilaterally with posterior open bite. The upper incisors were retroclined and the lower incisors were proclined. 15 mm of overjet and 3 mm of overbite was present. Mouth opening was restricted to 8 mm.
Fig 1: Pretreatment extraoral photographs showing bird beak face, with a mouth opening of 8mm and overjet of 15mm

The treatment was carried out in three phases:

**PHASE I**: Bilateral gap arthroplasty with Temporalis graft interposition was carried out, to relieve the TMJ ankylosis. (Fig 2). The patient was also instructed to carry out certain mouth opening exercises using spring loaded acrylic plates to improve the function. Mandibular distraction osteogenesis was then carried out using Bilateral Extraoral unidirectional distractors (Fig 4).
FIG. 2: CONDYLECTOMY PROCEDURE

FIG 3: POST SURGICAL MOUTH OPENING OF 26 MM

FIG 4: PLACEMENT OF EXTRAORAL DISTRACTORS
Fig 5: post distraction extra oral and intraoral photographs
**PHASE II:** It consisted of the functional appliance phase in which the Frankel 2 appliance was used to allow functional modulation of the orofacial capsular matrix to prevent relapse, reankylosis and also aid in mouth opening. (Fig 6).

**PHASE III:** Fixed mechanotherapy was initiated after 1 year of Frankel 2 appliance wear (Fig 7), for aligning and establishment of occlusion using 022 MBT appliance.

Fig 7: Intraoral photographs showing initiation of fixed mechanotherapy
DISCUSSION

There was significant improvement obtained by employing Distraction Osteogenesis for this case, none of the other Orthodontic or combined Orthognathic approaches would have given the same results. Probably the use of a multi-directional distractor would have given better results in terms of reduced open bite to be managed post distraction.

CONCLUSION

The patient described here showed favourable results in terms of function and aesthetics (Fig 8). Without the osteogenic distraction process, the results we achieved would not have been the same, since success with other
mandibular augmentation techniques are limited. Although it represents a new kind of technique with several questions still unanswered, osteogenic distraction is the best indicated treatment in such patients.

References


6. Codivilla A. On the means of lengthening, in the lower limbs, the muscles and tissues which are shortened through deformity. 1904. *Clin Orthop Relat Res* 1994;301:4–9


