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Original Article

Pre-arthroplastic and simultaneous mandibular distraction for correction of facial deformity in temporomandibular joint ankylosis

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ABSTRACT

Introduction: In cases of temporomandibular joint (TMJ) ankylosis, interposition arthroplasty allows return of functional jaw movements. In order to improve the facial appearance, distraction osteogenesis is the treatment of choice, and may be timed either as a pre-arthroplastic, simultaneous or post-arthroplastic procedure. This study was planned to compare the treatment outcomes of pre-arthroplastic distraction (PAD) and simultaneous arthroplastic distraction (SAD) to establish the better treatment modality in terms of improvement in function and aesthetics.

Materials and methods: This prospective randomized experimental study included 20 children and adolescents suffering from facial deformity due to long standing unilateral TMJ ankylosis. They were randomly allocated to the two surgical groups with ten in each group.

Result: Both groups resulted in good facial symmetry and aesthetics. Initially, during the distraction period, mouth opening of SAD group scored less than that of PAD group but became comparable in 30 days. More pain at the distraction site and over the normal TMJ was observed in PAD group. The excursive movements were almost comparable in both the groups.

Conclusion: We conclude that both procedures are effective in correcting the post-ankylotic deformity and improving function. Although PAD has better control over movement of the distracting segment, the contralateral TMJ may experience pain. SAD requires a shorter management period but is associated with a temporary decrease in function. Also, control of distraction may be difficult and chances of reankylosis are always there.

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1. Introduction

Temporomandibular joint (TMJ) ankylosis is one of the most debilitating joint disorder adversely effecting the quality of life. It hampers both facial aesthetics and functional movements of jaws.[1] Treatment of TMJ ankylosis is challenging, but rewarding and various protocols have been established.[2,3]

Distraction osteogenesis is a form of in vivo tissue engineering whereby viable bone is regenerated as a result of gradually separating the two osteotomized bone edges.[4] It has the added benefit of distraction histogenesis, or soft tissue augmentation, and has been effectively used for the reconstruction of congenital and acquired deformities of the mandible. Ilizarov,[5,6] a Russian physician, developed this technique in Kurgan in West Siberia, when treating veterans of the World War II, and has gained popularity even in maxillofacial region.[7]

Distraction osteogenesis has recently become the mainstay of treatment for correction of facial deformity in TMJ ankylosis. While interposition arthroplasty may be performed to correct the functional movements, distraction may be timed either before (pre-arthroplasty),[8–10] during (simultaneous arthroplasty)[11–16] or after (post-arthroplasty).[17]

This study was conducted with an aim to compare the treatment outcomes of pre-arthroplastic distraction (PAD) and simultaneous arthroplastic distraction (SAD) to establish the better treatment modality.

2. Materials and methods

The present study was carried out in the Department of Oral and Maxillofacial Surgery, King George's Medical University, Lucknow from 2011 to 2012, with the aim to compare the treatment outcomes of PAD osteogenesis (Group I: PAD) and simultaneous distraction osteogenesis with interposition arthroplasty (Group II: SAD) in unilateral TMJ ankylosis cases presenting with facial deformity.

A total of 20 cases who agreed to participate in the study were included after obtaining their informed consent or their parents', if minor. The study was duly approved by the Institutional Research Board. Pre- and post-operative evaluations were done on the basis of clinical and cephalometric analysis. Pre-operative assessment included a thorough history, clinical examination and radiological evaluation on cephalogram (antero-posterior and lateral), orthopantomogram and computerized tomographic scans.

Patients were randomly allocated to the two experimental groups, with ten in each. In Group I, a two-stage protocol was followed. Initially in the first stage surgery, the distractor was placed via submandibular approach. The second stage surgery was performed after a consolidation period of 4–6 weeks, wherein temporalis fascia interpositional arthroplasty was performed via Al-Kayat Bramley approach and the distractor was removed. In Group II, temporalis fascia interpositional arthroplasty and distractor placement was done in a single stage. Mouth opening exercises were started on the first post-operative day and distractor activation on the fifth post-operative day.

The parameters for assessment of function were maximal inter-incisal mouth opening, excursive movements (protrusion, lateral excursion), pain over the distraction site and the contralateral non-ankylosed TMJ, the time required to achieve the desired mouth opening of approx. 35 mm post-operatively with improvement in aesthetics and any complications. Both the groups were prospectively followed for at least 6 months post-operatively, with a mean of 1.7 years.

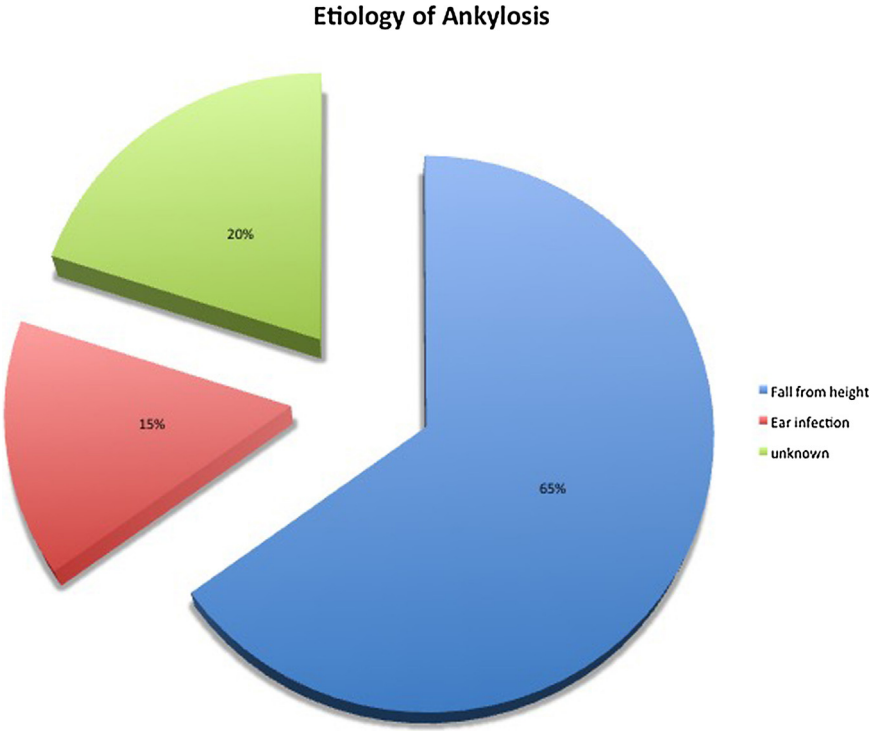

Fig. 1 – Aetiology (%).