

## TEMPOROMANDIBULAR JOINT ANKYLOSIS A PRELIMINARY REPORT

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### SUMMARY

*A technique to correct the functional and cosmetic deformity in temporomandibular joint ankylosis using costochondral grafts is described. Two cases, one each of a bilateral and unilateral ankylosis is presented to illustrate the results obtained.*

The victim of temporomandibular joint ankylosis cannot open his mouth, masticate or speak properly. If it occurs in early childhood severe cosmetic disability and subsequent psychological stress complicate a distressing functional problem. Most operative methods have the limited aim of improving masticatory function only. We present a method of correction using costochondral grafts which corrects the functional and cosmetic disability.

#### *Pathologic Anatomy*

Damage to the growth centre and loss of functional matrix results in a loss of length and vertical height of the mandible. This hypoplastic mandible is retroposed behind the maxilla resulting in an open bite. In unilateral ankylosis the normal mandible gets shifted across the midline resulting in a flattening of the face on the normal side. The secondary effect of this on the maxilla results in a loss of the vertical height on the affected side and medial displacement of the maxilla on the contra-lateral side. Any surgical procedure which centralizes the mandible and corrects the deficiency in the vertical height will result in an open bite on the affected side and a cross bite on the contra-lateral side. The temporoalis, medial pterygoid and the masseter muscles are atrophic and contracted, which tends to keep the mandible in the retroposed position after release.

#### *Surgical Procedure*

The aim of management is to restore mas-

ticatory function, normal occlusion and appearance of the face. First, the ankylosis is released and the vertical height of the mandible is restored by a costochondral graft, then the occlusion is corrected by orthodontia and finally the cosmetic appearance is restored by genioplasty and/or onlay graft. The temporomandibular joint is approached by a preauricular incision as described by Sawhney (1986). A high osteoarthrectomy is done. We prefer a roto-osteotome to a neurosurgical burr which removes too much bone and further reduces the height of the mandible. A new glenoid fossa is then created. The coronoid process is then excised. The angle of the mandible is approached by a submandibular incision. Care is taken to prevent injury to the lower branches of the facial nerve. The periosteum is incised at its inferior border, which is stripped off from both the surfaces of the vertical ramus, detaching the insertions of the medial pterygoid and masseter muscles. The mandible is now free and can be moved to a central position. A rubber wedge of thickness equal to the deficiency in the height of the ramus is placed between the molar teeth and intermaxillary fixation is applied. The wedge helps to correct the gagging of the molar teeth and restores mandibular height. A costochondral graft taken from the 8th rib is wired to the posterior edge of the mandible. The cartilagenous end of the graft is placed in the newly created glenoid fossa. The wound is closed in layers with suction drainage. Intermaxillary fixa-



Fig. 1. Pre-operative view of a bilateral ankylosis, showing the classical bird face deformity.

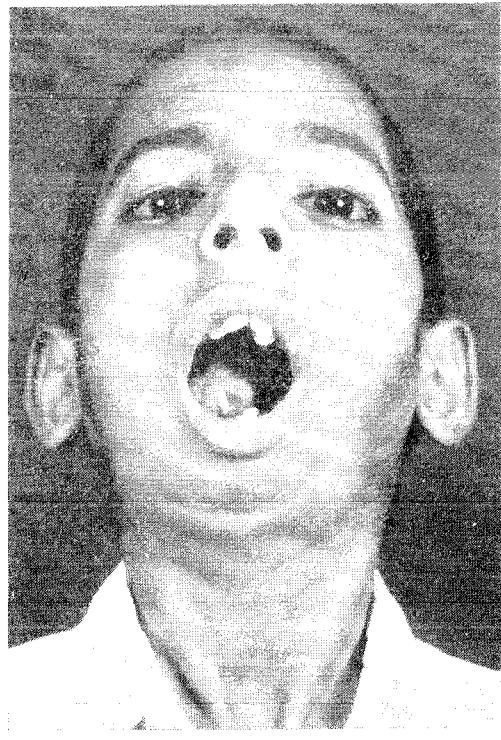
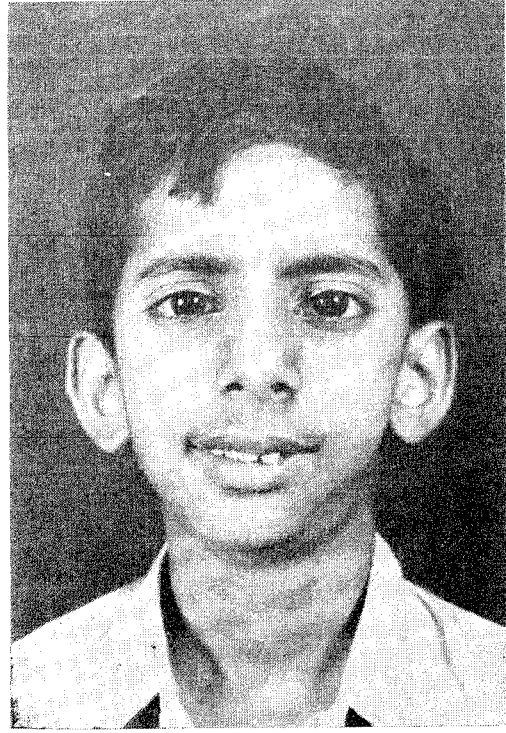


Fig. 2. Post-operative result at 6 months after costochondral graft illustrates mouth opening of 3.5 cms.



(3)

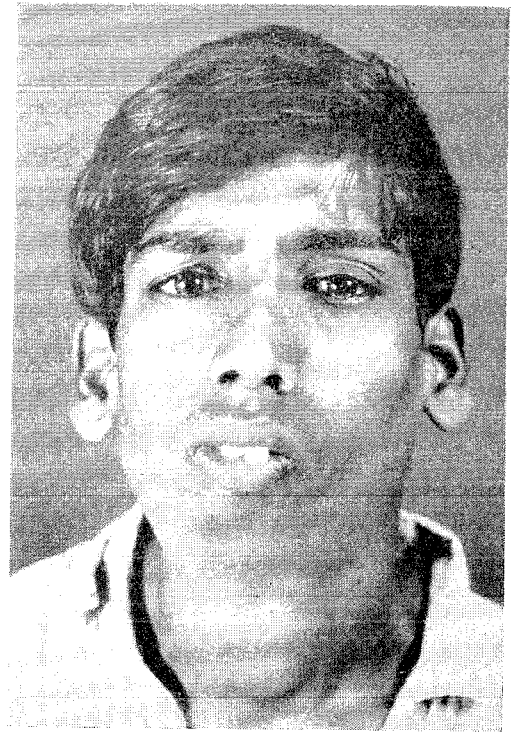


(4)

Fig. 3 & 4. Final result after genioplasty.

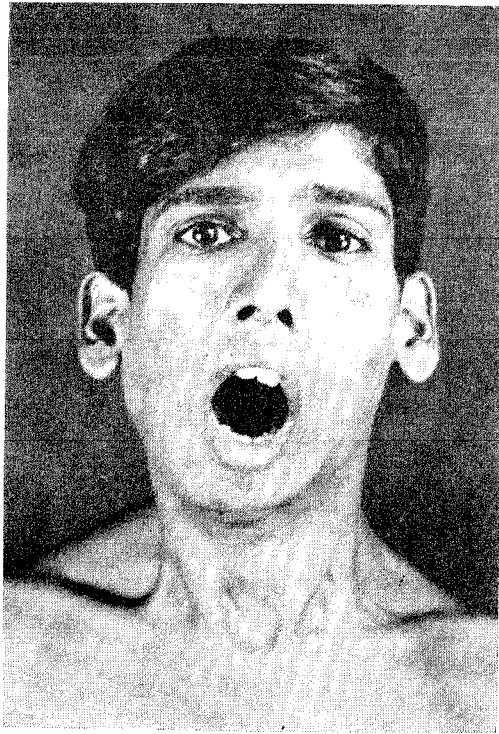


(5)



(6)

Fig. 5 & 6. Pre-operative view of case 2 illustrating the deformity in unilateral ankylosis.



(7)



(8)

Fig. 7 & 8. Final result after costochondral graft and genioplasty.

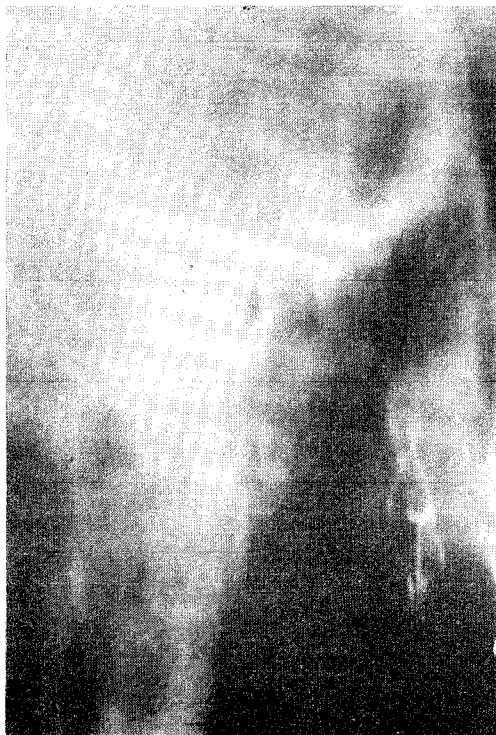


(9)



(10)

Fig. 9 & 10. Pre-operative right temporomandibular joint x-rays of case 2 in mouth open and closed position illustrating sclerosis of the joint.



(11)



(12)

Fig. 11 & 12. Post-operative tomograms right temporomandibular joint of case 2 in mouth open and closed position.

tion is removed after 6 weeks and rubber wedging and jaw exercises started. Full mouth opening is restored in about a week to ten days after removal of the intermaxillary wires.

### Case Reports

*Case 1 :* CMR, a 12 year old boy presented with bilateral ankylosis of the temporomandibular joint in April '85. Bilateral condylectomy done elsewhere 3 years earlier had failed. He had severe mandibular hypoplasia with the classical bird face deformity (Fig. 1). Bilateral osteoarthrectomy with costochondral grafts was done by the technique described. But for temporary facial nerve paralysis he had no complications. Six months after surgery he could open his mouth 3.5 cms (Fig. 2), his occlusion was satisfactory and the facial paralysis had recovered fully. Although his appearance had improved his chin was still hypoplastic and lip balance poor. In Nov. '85 he had an onlay graft for chin augmentation from the iliac crest. The graft united well in six weeks. When finally seen 8 months after his second operation, his masticatory function, occlusion and cosmetic appearance were good (Fig. 3 & 4).

*Case 2 :* R, a 16 year old boy had a right temporomandibular joint ankylosis following an injury 4 years earlier. He had a severe classical unilateral deformity (Fig. 5 & 6). He was treated by a right costochondral graft. At 2 months he could open his mouth 3 cms he had left sided cross bite and a right open bite. Orthodontia by a screw expansion plate with an occlusal block corrected the cross bite in 6 months. The right open bite had corrected spontaneously. A genioplasty by a sliding osteotomy with bone graft was done 9 month after initial surgery. On assessment 3 months later the bone graft had united well. His mouth opening was 3 cms in between the incisors (Fig. 7). He could move the jaw from side to side but protrusion was not possible. The cosmetic result was satisfactory (Fig. 8).

### Discussion

The first attempt at surgical correction of this difficult problem was by angle osteotomy with interposition of the masseter and medial pterygoid muscles (Esmarch's, 1860). A hinge or rat trap movement which is inefficient for mastication was achieved. The procedure does not attempt to correct the cosmetic deformity. For effective mastication a grinding or side to side movement is essential and this is possible only if the new joint is at its original site. Condylectomy and gap arthroplasty were attempts to correct this drawback but the incidence of recurrence was high (Topazian, 1966). In the latter procedure the mandible tended to go back thereby increasing the open bite and worsening the cosmetic disability. Interpositional arthroplasty had some of these disadvantages.

Numerous materials have been used successfully. We have found the acrylic spacer (Sawhney, 1986), a cheap and effective technique. It preserves the height of the mandible but does not correct the deficiency and therefore does not improve the cosmetic appearance in cases with severe deformity. Kent (1974) developed a prosthesis which can effectively restore the height of the mandible. Its disadvantages are its cost and that it has no growth potential and therefore is not suitable for smaller children. It like any other technique that uses foreign material has a risk that a small percentage of them will get extruded out.

In contrast the costochondral graft not only restores the height but has a growth potential as well (Poswillo, 1974). Prolonged immobilization which this technique requires has been criticized as a cause of recurrence (Silagi & Schow, 1970; Sawhney, 1986) but we have not encountered any problem from this. Full mouth opening is usually restored within one week to ten days of removing the inter maxillary fixation. An important cause of recurrence after surgery for ankylosis is



that the shortened elevator muscles tend to draw the mandible back into a retroposed position. The resulting open bite mechanically interferes with efficient mastication. The stripping of the muscle which we employ corrects this and is an important factor in the success of the technique.

In unilateral cases we have not done osteotomies on the contralateral normal side as recommended by Rowe (1982) and we have not encountered any problem due to torsional stress on the normal joint. One problem encountered

immediately is the occlusal problem which can be corrected in children by orthodontia. In adults maxillary osteotomies may be necessary.

### Conclusion

The technique involving use of costochondral graft effectively restores function and the cosmetic appearance. Encouraged by our results, we have started using it in all cases of temporomandibular joint ankylosis with severe deformity.

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