

THE MAXILLARY ORTHOPAEDIC COMBINATION APPLIANCE FOR NEW BORN CLEFT LIP AND PALATE BABIES

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SUMMARY

At most centres in the west a cleft lip and palate baby is given a maxillary orthopaedic combination appliance soon after birth. A similar appliance is now being given by us. This appliance is being presently given only as an obturator. It is intended to study its efficacy in conjunction with early lip repair and primary bone grafting in the near future.

(Key Words : Maxillary Orthopaedics, Combination Appliance, New Born, Cleft Palate.)

A convenient method of obturation in the new born cleft palate baby has been for us, until recently, a difficult problem. (Fig. 1)

In the past, palatal plates with extra-oral wires attached to cervical straps and head caps were given (Fig. 1.a.). These were cumbersome and added to the apprehensions of the already flustered parents. Extra oral traction for the protruding premaxilla in bilateral cleft cases along with palatal plates (Bauer 1965) was also very discouraging, as it entailed faithful and intelligent attention by the mother to see that the band remained in place. (Fig. 1 b). It was also important

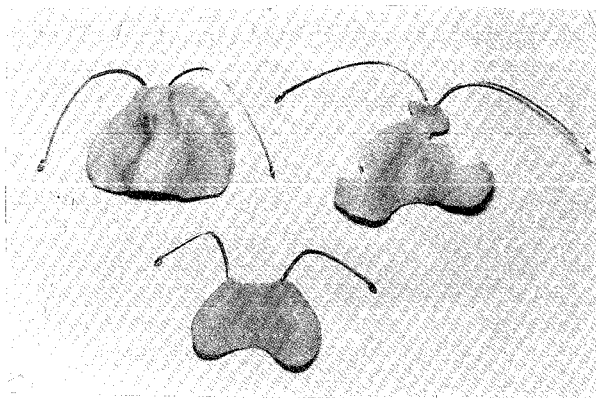


Fig. 1 (a) :—Palatal obturators with extra-oral wires.

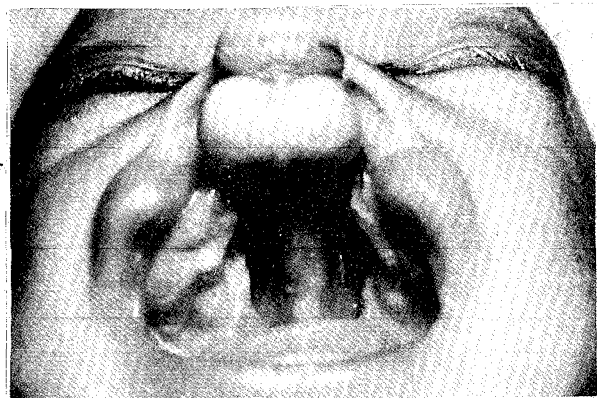


Fig. 1 :—Baby with Bilateral Cleft Lip and Palate.



Fig. 1 (b) :—Extra Oral traction for premaxilla along with palatal plate and extra oral wires.

that we followed the case closely to affirm that a safe amount of pressure was applied, as excessive pressure could cause lingual rotation of the premaxilla and severe buckling of the nasal septum,

as well as ulceration and irritation of the prolabium (Cronin and Penoff 1971).

The present view, of course, in such cases is

that a repaired lip (Hotz'88, personal communication) is the most efficient force that can be applied to the premaxilla. Definitive lip repair can be delayed until the premaxilla has been brought to a favourable position, (Cronin and Penoff, 1981). The baby wears a palatal plate all along.

Jacobson and Rosenstein (1984) described a palatal appliance which they named the maxillary orthopaedic combination appliance for the cleft lip and palate baby. This appliance functions as a palatal obturator which maintains the width of the alveolar arch. The appliance is used to mould the cleft segments into proper alignment by judiciously trimming the appliance from time to time in the direction in which movement is anticipated after lip closure. An expansion screw added to the appliance can expand the cleft segments, as required, in order to accommodate optimally, the protruding premaxilla over which lip adhesion, followed by lip surgery has already been performed.

Such a maxillary orthopaedic combination appliance is being routinely given to cleft lip and palate babies at this centre. In the past year we have provided more than ten patients of cleft lip and palate of various classifications with this appliance. Of course, our initial aim was to provide an obturator acceptable to the new born baby and the mother too. In all the cases total acceptability by the baby and the parents was observed, and it was a matter of great satisfaction to us. In one case the parents came back for a

second appliance as the first one had broken and the baby would not accept feeds without it. (Fig. 1.c.)

This appliance has yet not been tried here in combination with lip repair and primary bone grafts as studied and reported by (Rosenstein, 1976), Rosenstein, (1965), and Jacobson and Rosenstein (1984). However, as a preliminary report the acceptability of this appliance is very encouraging and it is intended to study its effectiveness in obtaining good arch form when given in conjunction with early lip surgery in the near future. A technique for taking the impression and fabricating the appliance is described.

Impression Technique

The quality of a cleft lip and palate impression depends on two factors. These are, the complete inclusion of the palatine shelves with a good reproduction of the mucobuccal fold and an adequate extension of the impression into the cleft area. The impression must extend into the nasal chamber and every available undercut. These undercuts are utilised in the retention of the appliance.

We are fortunate to have an upper tray designed by Dr. Claude Hockenjos and Dr. Labor H. Schutzbach of Basel, Switzerland. This is an expandible tray especially designed for cleft palate babies. (Fig. 2 a, 2 b). However, perforated acrylic trays of various sizes can be prepared and serve very well. (Fig.3)

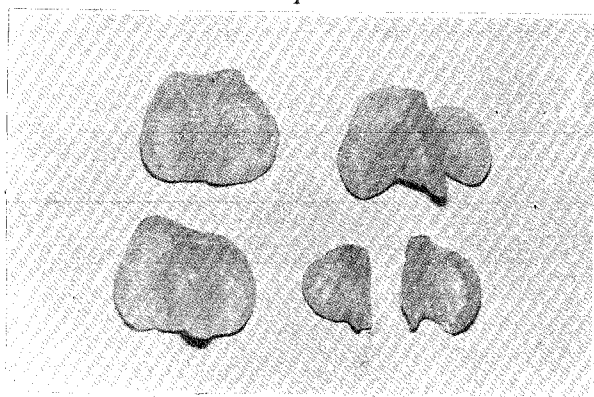


Fig. 1 (c) :—Maxillary orthopaedic combination appliance (R-Lower) a broken appliance.

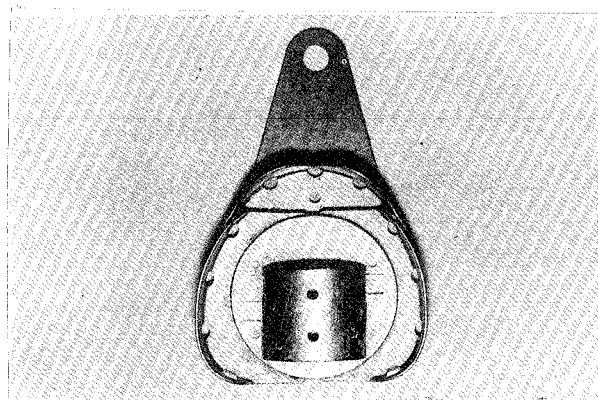


Fig. 2 (a) :—A metal tray designed for cleft palate impressions.

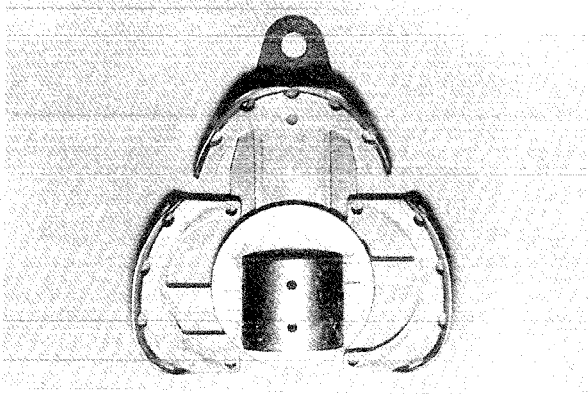


Fig. 2 (b): Expanded tray.

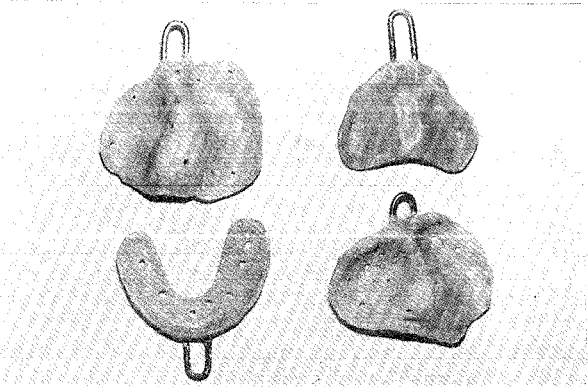


Fig. 3: Acrylic trays.

The tray is checked in the baby's mouth for good lateral as well as anteroposterior coverage. Posteriorly, the tray should cover the maxillary tuberosity region.

After the tray has been tried in the mouth. Alginate impression material is mixed to a thick doughy consistency using warm water if the weather is cold. Since colour timed Alginate is still not available in most centres here, it is essential to practice mixing the material in a manner, that it sets within 15-20 seconds when the tray is pressed in position in the mouth. The tray is loaded, seated in the mouth with the baby in an upside-down position, the assistant holding the baby by its legs (Fig. 4), Hotzand Gnoinsky, personal communication (1988). This ensures maximum airway and at the same time excellent visibility. The set impression is removed from the mouth by a fast snapping action. The impression is examined for its completeness. A powerful Suction tip is always



Fig. 4:— Impression technique for upper (note, the baby is held by its legs).

kept handy to suck out any alginate which might have torn off from the impression and left in the undercuts. The impression is always taken when the baby is on an empty stomach.

A lower impression is taken with the baby lying sideways. This impression is taken for record purposes. The U/L impression (Fig. 5) are poured

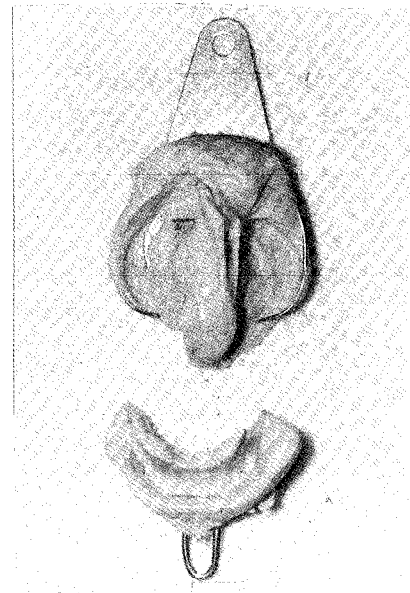


Fig. 5: U, L Impressions.

in stone plaster and models prepared for study and for working purposes.

Appliance Fabrication

The retention of the maxillary orthopaedic appliance depends upon the utilization of every available undercut in the cleft area. The most valuable retentive area is the exposed nasal surface of the maxillary palatal shelf and the inferior turbinate. These undercuts are never blocked out. However, the area representing the upper part of the nasal chamber may be partially blocked out to facilitate comfortable breathing. The appliance prepared is a combination maxillary orthopaedic appliance because it combines both hard and soft acrylic and it may be either an active or a passive appliance. The appliance made at this centre is from heat cure soft acrylic and heat cure acrylic.

Self cure soft acrylic and heat cure acrylic. Rosenstein, was tried and given up because the denture liners in use here tend to tear off easily and the appliance does not last. Of course, it is far more convenient to prepare the appliance in self cure, than to process it in heat cure acrylic.

The 'wax up' of the appliance is done, like for

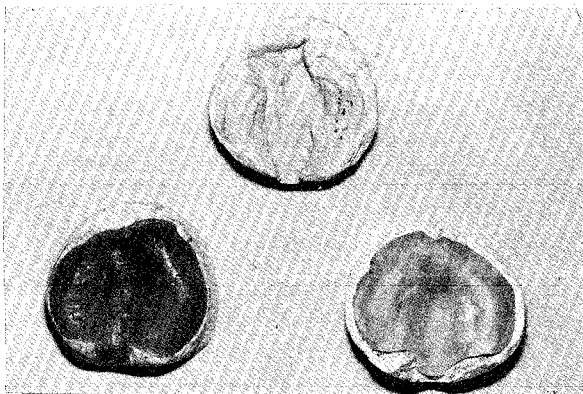


Fig. 6:—(U) study model (L-R) waxed up model, model with appliance.

any other heat cure appliance with the wax properly adapted in all the undercuts. (Fig. 6)

The waxed up model is then flaked and placed for dewaxing in the acryliser. After dewaxing the flask is opened, the molten wax washed out with hot water and detergent powder. The molds are then allowed to cool & cold mold

seal applied. Heat cure soft clear acrylic is mixed and kept aside, followed by mixing of heat cure hard clear acrylic.

The heat cure soft acrylic is packed into the cleft area when the former has reached a doughy consistency. Over this, heat cure hard acrylic is packed so as to cover the palatine shelves, alveolar ridges and over them into the vestibule. A trial closure of the flask is done and the excess removed. The flask is opened, checked for proper flow of acrylic and finally closed and clamped under pressure. It is then put in the acryliser and allowed to boil for the requisite time. The flask is then cooled and the appliance removed from the working cast.

The appliance is finished and polished and tried in the baby's mouth. Posteriorly the extension of the appliance should be checked so that



Fig. 7:—Baby wearing the appliance.

the delicate, cleft uvular area is adequately relieved. Along the alveolus the appliance should cover the maxillary tuberosities. (Fig. 7). The appliance should extend 1-2 mm past the crest of the ridge all along buccally and labially. (Fig. 6, 7)

The blanching in the maxillary tuberosity region which can be seen through the transparent acrylic is an indication of the proper fit of the appliance.

The baby is kept under close observation for sometime after the insertion of the appliance. Feeding with a bottle is tried, after observing that the baby is comfortably swallowing his saliva. If there is gasping or discomfort during feeding, perhaps the extension of the soft acrylic in the cleft



Fig. 8: Feeding.

area is too far posterior. Trimming in this area is done, until the baby can comfortably swallow his

feed. (Fig. 8). The mother is then taught how to remove, clean, and reinsert the appliance after every feed.

The baby is observed for 1-3 hours, during which the mother intermittently feeds the baby. The baby is called for immediate followup the next day. The appliance is removed and the mouth checked for any pressure spots, which are relieved.

The patient is then initially followed up at weekly intervals, followed by fortnightly appointments. An expansion screw may be added in the hard palate area where required. The combination maxillary orthopaedic appliance is a great step forward in the overall development of the new born cleft palate baby.

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