

Trouble free impressions in cleft lip and palate infants.

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ABSTRACT

In this article the authors describe a simple, easy and uncomplicated procedure for making accurate impressions in infants with cleft lip and palate. A stepwise procedure is described to obtain accurate reproductions of maxillary arch in infants with cleft lip and palate. The impressions, thus obtained, can be used to prepare maxillary orthopedic plates or obturators to help nursing and feeding in these infants.

KEY WORDS

Cleft lip palate, infant, Impression

INTRODUCTION

Clefts of the lip and palate are the most common congenital defect involving the orofacial region ^[1]. The aim of treatment in cleft patients is to restore normal anatomy; function. A variety of surgical procedures have been advocated to achieve these goals. Surgery alone may not prove to be beneficial in all cases, especially where the separation between the cleft segments is large. Presurgical infant maxillary orthopedics (PIMO) may prove to be beneficial to the surgeon if a better alignment and closer approximation of the cleft segments is achieved *before* the actual surgical repair. The contemporary view is that when used as an adjunctive procedure to definitive lip repair, infant maxillary orthopedics provides presurgical benefits ^[2]. Many different appliances exist for use in the cleft infant for maxillary orthopedics and may be broadly grouped under active, semi-active or passive categories ^[3]. In addition, are the presurgical nasoalveolar molding (PNAM) plates ^[4]. The crucial initial step in fabrication of any appliance or obturator is the impression procedure. Different impression procedures have been reported in the literature for cleft lip and palate (CLP) infants. Patient positioning, tray and impression material selection are the important factors to consider in any impression procedure. A number of different positions of the infant have been adopted for cleft palate impression making in infants including face down ^[5], upright ^[6], horizontal raised to sitting as the impression sets ^[7] and even inverted upside down ^[8]. Tray selection is an important step. The tray should be large enough transversely to include the lateral maxillary segments, posteriorly cover up to the maxillary tuberosities and provide a good reproduction of the mucobuccal folds. Anecdotal reports mention ice cream sticks as suitable trays for infant impressions. Complications encountered when taking impressions in cleft lip and palate infants arise primarily due to the fact that they are obligatory nasal breathers. Chate, on the basis of a questionnaire survey, reported that dentists involved routinely in the care of CLP patients have encountered hazards like difficulty in removal of impression due to engagement of undercuts, fragmentation of the impression during withdrawal from the mouth with subsequent respiratory obstruction due to lodgment in the respiratory passage and cyanotic episodes of which few resulted in asphyxiation ^[9]. Here we describe the technique followed at our institute, which is simple, accurate and involves no complications.

IMPRESSION PROCEDURE

All infant impressions at our institution are taken in the neonatal intensive care unit with a surgeon present at all times to avoid complications and to handle airway emergencies. Parents are instructed not to feed the infant for at least two hours prior to the procedure. High volume suction is also ready, at all times, in case regurgitation of the stomach contents occurs during the procedure. The impression is made when the infant is fully awake without any anesthesia or premedication. Infants should be able to cry during the impression procedure and absence of crying may be indicative of airway blockage. The parent sits on a stool of adjustable height. The infant is made to lie in a supine position on the lap of the parent with the head on the knee at a lower level. The clinician positions himself in a comfortable 10 o'clock position to the infant's head. A wax sheet of approximate size and shape is adapted intraorally using the thumb and index finger.

(Fig.1)



Fig 1 – Wax sheet after initial intraoral adaptation in BCLP infant

A stone model of the negative wax reproduction is then obtained (**Fig.2**)



Fig 2 – Stone cast used to fabricate the acrylic tray

A wax spacer is adapted on the stone model on which a custom acrylic tray with a handle is prepared (**Fig.3**).



Fig 3 – Custom acrylic tray smoothed and polished

The tray is smoothed and polished to avoid rough areas. Pea-sized amounts of fast setting elastomeric putty material are kneaded together taking care to use more catalyst to accelerate setting, loaded into the custom tray and impressions obtained with the infant, parent and operator in the same position, as mentioned earlier (**Fig.4**).



Fig 4 – Final Impression of the BCLP infant made with infant lying on the lap of the parent



Fig 5 – Final Impression of BCLP infant in fast setting putty material



Fig 6 – Final Impression of UCLP infant in fast setting putty material

After the tray is removed, the oral cavity is inspected for any loose fragments of impression material.

DISCUSSION

Impression procedures in cleft infants pose a unique set of challenges in infants including the size constraints imposed by the infant's oral cavity, anatomical variations associated with the severity of clefts and a lack of ability of the infant to cooperate and respond to commands. The impression procedure described has been carried out at our institute routinely with all the necessary precautions and fortunately no complications have been encountered. Most of the appliances described for PIMO require a high degree of parental cooperation for successful therapy. In the impression procedure described, parents are also involved right from the beginning. This helps in assuring as well as motivating them to be involved in the care of their infant. Alginate^[10], low fusing impression compound^[11] and elastomeric impression materials^[5] have been routinely employed for taking impressions of neonates with oral clefts. An ideal impression material should exhibit certain characteristics to be useful in both a clinical and

laboratory setting. The use of fast setting color-timed alginates has been suggested in cleft infants. Alginate has poor tear strength^[12] and in our earlier experiences was found to fragment on removal especially since the material extrudes deep into the cleft undercuts. One particular method suggests packing the cleft areas with cottonoid patties to avoid complications when using alginate^[13]. Impression compound is also used for impressions of infants with oral clefts. The advantages of its use are that it can be removed before it sets in case of any emergency and it has excellent resistance to tearing. Impression compound, however, is a thermoplastic material and overheating can lead to scalding or burns in infants and leaching out of volatile components of the compound, which may be harmful to the infants. The use of elastomeric impression material in cleft infant has been described previously and in our experience has led to no complications whatsoever. We use fast setting elastomeric putty material at our institute and it reproduces all the areas of interest with good surface detail. Elastomeric putty impression materials, unlike alginate, does not extrude deep into undercut areas in the region of the cleft. This helps during removal as it resists tearing and, as a result, removal is atraumatic to the infant. Additionally, in a laboratory setting the material remains dimensionally stable and permits accurate pouring of multiple casts.

CONCLUSION

The procedure described is simple, easy to do and minimizes any risks to the infant during the procedure. Knowledge of the care to be taken during the impression procedure in CLP infants leads to better preparation and coordination of the efforts of the various specialties involved in CLP care as well as reduce potential hazards.

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