

## Nasoalveolar molding in early management for newborn with labiognatopalatoschizis

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### ABSTRACT

A 1-week-old female infant with bilateral cleft lip and palate (CLP) was referred to the Department of Prosthodontic, Hasanuddin University Dental Hospital. The nutrition was managed through a nasogastric tube. The patient was in primary need of appliance that could support the feeding. Intraoral examination revealed bilateral complete CLP deformity diagnosed as *bilateral complete labiognatopalatoschizis*. It was performed fabrication of nasolalveolar molding (NAM) in order to reduce the severity of the initial cleft deformity and to achieve better and more stable results in CLP infants, in particularly advantageous to lengthen the deficient columella prior to the primary surgical repair of the lip and nose. Preliminary impression was done at the first appointment using custom tray and elastomeric material. At 2 weeks after birth, a conventional molding plate was fabricated on the maxillary cast. After the NAM was finished, try in was performed on the patient's mouth and adjustment were done to its edges. It is concluded that NAM allows an overall improvement in functional activity thus increasing infant's weight prior to surgery, also correct the aesthetics of the nasolabial complex in bilateral cleft conditions while minimizing the extent of the surgery and the overall number of surgical procedures.

**Keywords:** nasolveolar molding, labiognatopalatoschizis, cleft lip, cleft palate

### INTRODUCTION

Labiopalatoschisis or cleft lip and palate (CLP), is a craniofacial congenital disorder caused by disorders of facial development in the embryo. Unification failure of processus maxillaris and processus nasalis medialis especially at week 5-7 pregnancy will result in unilateral or bilateral labioschisis. Processus medial nasalis, which is the part that forms the two segments intermaxillaris, if it fails to fuse, there is a gap called palatoschisis. Teratogenic environmental factors and genetics play a role in the formation of CLP. Intrauterine exposure to anticonvulsants can increase the incidence of CLP up to 10 times. Smoking habit during pregnancy can increase the probability. Other teratogens are alcohol and retinoid acid.<sup>1,2</sup>

The CLP is a common birth defect. Both can affect several body systems and functions, including eating and drinking, facial development, teething, ability to speak, and can have social and psychological impacts on children and parents.<sup>3</sup>

Babies born with a cleft palate may have difficulty on food intake, even milk. The gap cannot be closed tightly, given the presence of incomplete palatal structures. Discharge from the nose due to the inability of the palate to separate the nose from the oral cavity, as well as the baby being easily choking when breastfeeding, often occurs in infants with a cleft palate defect.<sup>3,4</sup>

Feeding appliances are often required by CLP patients. Nasoalveolar molding (NAM) is a device

for the patients, so this article discusses the use of NAM which creates a seal between the oral and nasal cavities and helps the baby suck milk.

### CASE

A 7-day-old infant patient referred to the Hospital of Halimah Dg. Sikati Makassar with complaints of congenital CLP (Fig. 1). The patient wants to be immediately treated in order to provide food intake for the baby. Her parents provided informed consent prior to the treatment. Nutrition was managed through a nasogastric tube (NGT). The patient was in primary need of appliance that could support her feeding (Fig. 2A).



Figure 1 Patient's extraoral profile

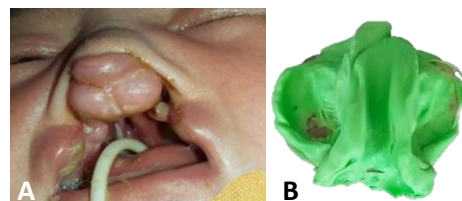


Figure 2A Intraoral examination, B preliminary impression

### MANAGEMENT

Anamnesis and objective examination are performed to confirm the diagnosis of bilateral complete labiognatopalatoschizis. On first appointment,

preliminary impression was done with elastomer material and infant acrylic custom tray. Child should be crying while making impression, otherwise it will be known that airway is blocked. After impression was fully set it was carefully removed (Fig.2B) and two casts were made, one for construction of molding plate and the other for measuring the intra alveolar gap.

Next, the mold is formed on working cast. The molding plate is made on a plaster model of clear, hard acrylic material and the edges also cleft area were fabricated with soft denture material (Fig.3). It is tried in the child's mouth and adjusted so that there is no acrylic in the cleft area. It is highly polished and smoothed (Fig.4).

After several adjustment, the feeding plate inserted in patient's mouth and checked for the adaptability by feed the baby with milk (Fig.5). Evaluation was done also, and the parents were taught to remove, clean and insert the appliance.

## DISCUSSION

Congenital CLP abnormalities are common. So, treatment of this deformity become a global health problem. Difficulty sucking milk often occurs when feeding or drinking in infants with CLP. In order for the baby to suck well, muscle coordination is needed intraoral, which is difficult for people with CLP.<sup>3</sup>



Figure 3 Design of the obturator



Figure 4 Insertion of the obturator



Figure 5 Feeding test

Coordination of the intraoral muscles is necessary for sucking success, which can be challenging in children with CLP. It is difficult to breastfeed a child with a cleft palate. The infant is unable to produce suction due to the opening in the palate.<sup>4,5</sup> The degree of difficulty, however, will vary depending on the severity of the cleft. The mother will need to make some adjustments in order to breastfeed a child with a cleft palate successfully. The modified football hold (child is normally held at a 45°) is an example of a position that can be used to reduce nasal regurgitation.<sup>6</sup>

Feeding obturator is a passive device designed to provide a normal contour to the cleft alveolus and hard palate. They separate the oral and nasal cavities and in doing so provide a surface to position the nipple during suckling. The combined use of a palatal obturator and lactation advice can improve the time taken to feed, volume of intake, and growth at 4 weeks of age when commenced with newborn infants who have cleft palate or combined CLP.<sup>5</sup>

Previous research on NAM has yielded outstanding results. The alveolar cleft areas were reduced by more than 1 mm. nonetheless, it is believed that the number of surgeries and hence scarring will be minimized.<sup>4</sup> PNAM can help to reduce the cleft gap more effectively in CLP cases. Long term result of the method needs further investigation.<sup>6</sup>

It is concluded that while limiting the extent of surgery and the overall number of surgical treatments. The PNAM provides for an overall improvement in the aesthetics of the nasolabial complex in both unilateral and bilateral cleft situations.

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