

Happy Smile of a New-Born Infant with Cleft Lip and Cleft Palate

Istien Wardani, Dyah Ayu R

Department of Pediatric Dentistry, Faculty of Dentistry, Hang Tuah University and
Pediatric Dentistry Clinic dr Ramelan Naval Hospital

Online submission : 13 Juni 2022

Accept Submission : 20 Juli 2022

ABSTRACT

Background: Cleft palate of the new-born infants with or without cleft lip, are recognized to be at risk of feeding difficulties, making it difficult to maintain adequate nutrition, and also interfere the speech function and the parents also their psychological growth. **Purpose:** Surgical closure of the cleft lip may be accomplished shortly after birth to relieve the parents' anxiety as long as the general rules "triple tens" (more than : 10 week of age, 10 pounds of body weight, 10 grams of haemoglobine) that is frequently used in determining optimum timing for lip closure must be fulfilled. **Case Report:** Female baby at age 5 days, who was referred to pediatric dentistry clinic dr. Ramelan Naval Hospital Surabaya with parents complaining that their baby was born with cleft lip and palate and could not drink breast milk, easily choked, so they had to depend on the sonde. **Case management:** A maxillary feeding plate (=MFP) was made to close the cleft palate and regenerate the function of chewing and swallowing so that the infant obtains good nourishment and gain body weight until the palatal cleft closure operation. **Conclusion:** After the closure, her mother and family are psychologically able to prepare comprehensive protection for the child so that they too feel comfortable and confident. Smile can represent 80% of communication. When children feel comfortable because they can freely smile, this smile can attract other people to make it easier to adapt and socialize.

Keywords: Cleft Lip and Cleft Palate, Feeding Plate, Weight, Psychology.

Correspondence: Istien Wardani, Department of Pediatric Dentistry, Faculty of Dentistry, Universitas Hang Tuah. Jl. Arif Rahman Hakim 150, Surabaya, Indonesia. Phone 031-5912191. Email: istienwardani@yahoo.com

INTRODUCTION

Cleft Lip (CL) and Cleft Palate (CP) are disorder in the process of growth and development with the manifestation of a cleft in the lip or Palate and can be unilateral or bilateral. This gap not only affect the lips but also the Palate. This palate is a barrier between the nasal cavity and the mouth. CP can affect the hard palate or just soft palate or both. Disruption of the palate can cause interference with the process of mastication, swallowing and talking.^{1,2} CL is a disease caused by the contribution of environmental factors as well as genetic factors. The cause of most of these CL events is still unknown. 1 in 5 cases of CL are cases that occur due to genetic descendant. Risk factors for CL in infants have been around since the baby is still in the womb.^{1,2}

Some risk factors for the fetus to experience lip cracks are:^{2,3}

The mothers smokes, the mother has diabetes, consumption of certain drugs during pregnancy increase the likelihood of children experiencing CL, Rubella virus infection, deficiency of some vitamins during pregnancy. Pathogenesis The upper lip is a derivative of the medial nasal and maxillary processes. The failure to combine the medial nasal and maxillary processes in the fifth week of pregnancy, either on one or both sides, result in CL and usually occur at the junction between the central and lateral parts of the upper lip. Cleft can only affect the upper lip or can also extend further to the maxilla and primary palate. If palatal fail to occur also, CL occurs with CP, which forms Cleft Lip and Palate (CLP) abnormalities.⁴

Normally, secondary palate development starts from the right and left palatal processes. Palatal fusion begins at the 8th week of pregnancy and continue until the 12th week of pregnancy. CP occurs due to failure of total or partial fusion of the palatal. This can occur in several ways, like abnormalities in genes that regulate cell differentiation, growth, apoptosis, inter-cell adhesion, and cell signaling, as well as

interference with cell function due to teratogenic environment, or a combination of both.⁴

Environmental and genetic factors influence each other and play an important role in pathogenesis. Mothers who smoke during pregnancy are at risk of giving birth to children who experience CLP because the TGF gene mutation can occur. Smoking during pregnancy also affects embryonic growth by producing tissue hypoxia that interferes with tissue growth, especially the growth of the palate. In addition, serum folate can also decrease in pregnant women which can form a cleft or cleft that is often caused by folate deficiency.⁵

Alcohol consuming in pregnancy is often associated with abnormalities in the offspring called Fetal Alcohol Syndrome (FAS). This is because alcohol consumption by pregnant women can have teratogenic effects such as mental retardation, cardiovascular disorders, and sometimes clefting or crevices in the baby's oral cavity may occur.⁵

Some drugs can induce CLP. Chemotherapy drugs such as aminopterin, methotrexate, cyclophosphamide, procarbazine, and hydroxamic acid derivatives interfere with DNA synthesis that results in malformations in the fetus. The use of anti-seizure drugs, for example phenytoin, can inhibit overall embryonic growth, including facial prominences, which is characterized by a decreased rate of mesenchymal cell proliferation at facial prominences of around 50%.⁵ Formation of the baby's face occurs around seven to nine weeks after conception. Lips are formed around the seventh week and the roof of the mouth in the form of hard palate and soft palate, around nine weeks of age. Lips and palate grow individually, therefore it is possible to suffer either only CL or CP.^{5,6,7}

The clasification of CPL according to Veau can be categorized into :^{7,8}

- a. Classification 1 : only soft cleft palate or uvula
- b. Classification 2 : soft and hard cleft palate up to foramen incisivum

- c. Classification 3 : soft cleft palate, hard palate ---- involving alveolus and lip on one side
- d. Classification 4 : cleft on soft palate, hard palate ---- involving alveolus and lip on both sides

CLP of the new-born infants will cause trouble in lactation both from mother's milk and nursing bottle. This will cause limitation of mastication function and ease the entrance of foreign object to the nasopharynx. Infants are easily choked, therefore it is difficult in maintaining adequate nutrition and also disturb of the aesthetic and speech function.^{4,9}

Feeding cleft palate infants is different from that normal ones. For this special infants, to meet their nutritional needs, time, patience as well as the substitute for the lost palatal structure are badly required. Lack of knowledge on how to feed these infants frequently causes false ways by treating them as normal babies. Very often, the hole of the nipple of the nursing bottle is made larger to ease the lactation. This way of feeding, may bring about deglutition and aspiration of food, drink, saliva and air to the nasopharynx. Infection of the respiratory tract and even death may anytime happen.⁹

The difficulty in both eating and drinking will surely affect the infant's health. There have been found cleft palate babies with much less weight than the normal infants.^{8,10} "Maxillary Feeding Plate" (MFP) is a protesa made of acrylic, used to close the abnormal cleft between the oral and nasal cavities. The function of this is to help mastication, speech, maintenance of maxilla curve width and teeth arrangement, improvement of palatal growth, anti aspiration agent and in to gain normal palatal form to enable physiological position of the tongue.^{9,11}

In 1928 Wardill developed a new surgical technique. The palatal operation is commonly performed on 18 – 24 month babies. As for cleft lip, it can be done to babies of 3 months. The "Triple Ten" method is applied to babies above 10 weeks, Hb above 10 mgr/100 ml and body weight above 10 pounds. For

normal babies, it is not hard to reach, but for the cleft palate babies this may seem difficult.^{6,7,9,11} The results of research by Wardani, the difference in baby weight using Maxilla Feeding Plate (MFP) is very significant compared to those not using it. And babies without MFP do not get enough nutrition and make babies malnourished and this is stated in their lower body weight compared to those using MFP¹¹.

Patients with cleft lip and palate require extensive and routine care. Treatment is carried out in 4 stages, before the initial surgery to improve the shape of the lips, during the period of deciduous teeth, the period of mixed dentition, and the beginning of the period of permanent dentition.^{5,7} The goal is to get a better appearance, reduce the incidence of respiratory diseases, children can eat, talk, smile, listen and breathe as they should⁸.

CASE REPORT

A 5-days-old baby girl, who visited the clinic of pedodontics, Dental and Oral Depart., Dr Ramelan Naval Hospital Surabaya with her parents complaining that their baby was born with a cleft lip and palate and could not drink breast milk, was easily choked, so she had to depend on nasogastric tube. Patients are classified in group 4 (fig 1).

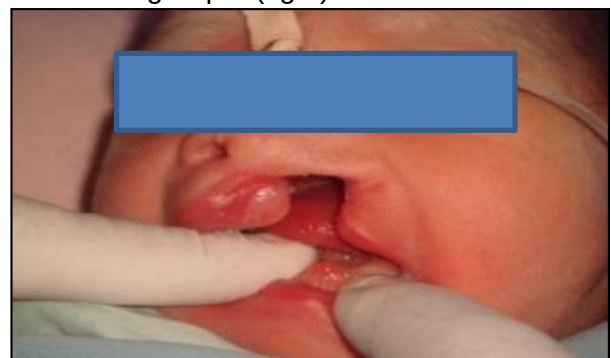


Fig 1. Patients are classified in group 4

CASE MANAGEMENT

Infants with bilateral CLP who visited the clinic of pedodontics, Dental and Oral Depart., Dr Ramelan Navy Hospital Surabaya. Name,

age, address, sex, parents' name, and body weight were recorded. Anamnesis and clinical examination to diagnose the cleft palate were performed. Extra and intra oral tests were also held.

Using special molding spoon (fig 2& 3) with "alginate fast setting", a palate shape was made. This palate shape was then casted using hard gypsum (fig 5). On the gypsum model, border line of the expected feeding palate was drawn (fig 6). The feeding plate was made of orthocryl, varnished and perforated with a small drill. This was done to tie the threat/dental floss to the middle front part of the feeding plate as additional fixation and safety (fig 7). The MFP was applied and checked on its position (fig 8).



Fig 2 & 3. Special tray



Fig 4. Tray is tried, then printed



Fig 5. Printout is casted using gypsum



Fig 6. The model is demarcated



Fig 7. MFP using orthocryl material

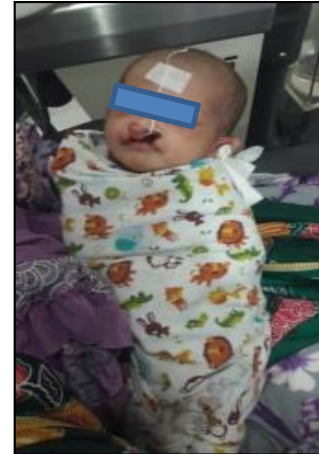


Fig 8. MFP is installed in patients



Fig 9. Patients can drink bottled milk and breast milk





Fig 10. monthly appointment during 1st, 2nd, 3rd 4th and month after MFP. The 5th operation was performed.



Fig 11. After CL operation

After the installation of the MFP, patients can drink breast milk or bottle milk (fig 9). In the first month, there was no significant difference in body weight compared to before using the MFP. However, the second month onwards shows that body weight continues to increase from month to month, so that the "Triple Ten" guidelines are met and the patient will undergo CL operation. In the 5th month the patient could have CL operation (fig 10 & 11).

DISCUSSION

Patients with CLP abnormalities usually cannot eat and speak properly. Surgery is the most important medical action to unite the cleft lip or sky in infants and children. With surgery, not only returns the anatomy to near normal, but also pays attention to the aesthetic aspects of the face, improves speech, eating and psychological functions of children and their families.¹² Generally parents of patients want the operation of the cleft lip to be carried out immediately, for aesthetic reasons.¹² Infants with this disorder the air entering the lungs is not filtered and warmed first by the nasal mucosa so that the baby will be susceptible to upper respiratory tract infections and easy to choke when drinking milk, so that it will cause respiratory problems that can be fatal if aspirated.^{3,4,9} Infants with CLP will have impaired swallowing function, making it difficult to meet their nutritional intake and consequently the child's nutritional value is reduced as shown in his body weight under the standard weight of the child^{6,7} According to Wardani's research, installation of MFP shows effectiveness in infants with CLP and is useful for helping the baby's development process through weight gain based on monthly observations where CLP infants who use MFP have higher average weight than average normal weight babies. same age.¹¹ Clinically, anatomically and physiologically, the organs involved in the ingestion function show that the palate, especially the palate soft plays an active role in the process of ingestion.

The child and family's psychics is the most important thing for the transition process of children back to school where mothers provide comprehensive protection so that children can smile confidently. As we get older, children are increasingly aware of their position as social creatures. The began to be sensitive to other people's views of him, and wanted to be well received in the midst of the environment. Body language including smiles can represent 80% of communication. When

children feel comfortable because they can freely smile, then this smile can attract other people to get close and hang out with him, making it easier for him to adapt and socialize.

CONCLUSION

Provision of MFP in newborn CL babies can help increase baby weight. As the baby's weight increases, his nutritional intake is fulfilled and the baby is immediately operated after meeting the Triple Ten requirements. Psychologically, mothers provide overall protection and support so that children can smile, trust relationships and be able to socialize especially in children with CLP abnormalities. Children will feel comfortable and free to smile, so they can attract other people to get close and associate with them, and make it easier for them to adapt and socialize, especially in children with CLP disorders. Children who have CLP abnormalities and have undergone surgery will have high hopes for their future.

REFERENCES

- Margulis AV, Mitchell AA, Gilboa SM, Werler MM, Glynn RJ, Hernandez-Diaz S, National Birth Defects Prevention Study. Use of Topiramate in Pregnancy and Risk of Oral Clefts. *American Journal of Obstetrics and Gynecology*. 2012; 207: 405.e1-e7.
- Facts about Cleft Lip and Cleft Palate | Birth Defects | NCBDDD | CDC [Internet]. Centers for Disease Control and Prevention. 2019 [cited 5 Agustus 2019]. Available from: <https://www.cdc.gov/ncbddd/birthdefects/cleftlip.html>
- Causes of Cleft Lip & Palate [Internet]. 2019 [cited 5 Agustus 2019]. Available from: <https://med.virginia.edu/pediatrics/about/clinicalandpatientservices/patient-tutorials/cleft-lip-palate/causes-of-cleft-lippalate/>
- Tolarova M. Pediatric Cleft Lip and Palate: Background, Pathophysiology, Etiology [Internet]. *Emedicine.medscape.com*. 2019 [cited 6 Agustus 2019]. Available from: <https://emedicine.medscape.com/article/995535-overview#a2>
- Prabhu S, Jose M, Krishnapillai R, Prabhu V. Etiopathogenesis of Orofacial Clefting Revisited. *Journal of Oral and Maxillofacial Pathology*. 2012; 16(2): 228
- Avery JK *Essential of Oral Histology and Embriology A Clinical Approach* St. Louis: C.V. Mosby; 1992 (pp 39-50).
- Converse, J.M.: Hogan,V.M dan Mc Carthy, J.G.: Cleft Lip and Palato,introduction,p.1930-1939 (dalam *Reconstructive plastic surgery*, vol.4. 2ed W. Company,Philadelphia,1997, 1930-2500)
- Sjamsudin E, Maifara D. Epidemiology and Characteristics of Cleft Lip and Palate and the Influence of Consanguinity and Socioeconomic in West Java, Indonesia: A Five-Year Retrospective Study. *International Journal of Oral and Maxillofacial Surgery*. 2017 Mar 1; 46: 69.
- Stone C. Cleft Lip and Palate: Etiology, Epidemiology, Preventive and Intervention Strategies. *Anatomy & Physiology*. 2013; 04(3).
- Levaillant, Jean-Marc., dkk. Prenatal Diagnosis of Cleft Lip/Palate: The Surface Rendered Oro-Palatal (SROP) View of the Fetal Lips and Palate, A Tool to Improve Information-Sharing within the Orofacial Team and with the Parents. *Elsevier*. 2016. [cited 14 April 2018]. Available from: [di:www.jcmfs.com/article/S1010-5182\(16\)30015-4/fulltext](http://www.jcmfs.com/article/S1010-5182(16)30015-4/fulltext).
- Wardani,I, & Budipramana, E:FDI IDA Bali. The effect of Maxillary Feeding Plate as Palatal Cleft Closure in New Born Infants Can Increase Body Weigh. 2022.
- Berger, Z. E., & Dalton, L. J. Coping with a cleft II: Factors associated with psychosocial adjustment of adolescentswith a cleft lip and palate and theirparents. *The Cleft Palate-Craniofacial Journal*. 2011; 48; 82–90.

