REVIEW ARTICLE

How to Overcome Feeding Difficulties of Cleft Lip and/Palate Infant?—An Overview

Nupur Saha[1], Shabnam Zahir[2], Arnab Santra[3]

Abstract

Cleft lip and cleft palate (CP) are the most common congenital anomalies, which can also occur together as cleft lip and palate (CLP), caused by abnormal facial development during intrauterine life. Shortly after birth, babies with CLP have facial deformation, feeding problems, and recurrent middle ear infections. The first and foremost concern for these babies is good nutrition, because of slow weight gain in infants with CP, especially in early life. Infant feeding is a complex activity demanding efficient coordination between the rhythmic processes of suck, swallowing, and respiration. For infants with cleft lip and/or palate, or opening in an oral area that is primarily responsible for the feeding problems because efficient sucking is dependent on the creation of negative pressure suction. These babies would be able to get all the benefits of feeding with some adjustments to feeding methods and positioning. Different feeding methods and interventions may reduce the stress experienced by the infant and mother and promote healthy growth and development.

Keywords: Breastfeeding, Cleft lip, Cleft lip and palate, Cleft palate, Feeding difficulties, Healthy growth and development.

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Introduction

Cheiloschisis, which is mostly known as cleft lip and Palatoschisis is mostly known as CP, is the most common congenital malformations all over the world. Shortly after birth, these babies have facial malformation, feeding difficulties, and recurrent middle ear infection.[1] The incidence of cleft lip/and palate is nearly 1:800 in our country, which means three infants are born with some type of cleft every hour in India.[2]

The term infant is typically applied to children under one year of age. Most of the primary lip surgery should be done at the age of 3 months, whereas CP surgery is done about at the age of 6–8 months of the infant's life. Cleft lip/and palate infant needs a healthy weight before going through these surgeries. In India, most the cleft infants are unfit for primary cleft surgeries at the actual time because they are underweight. Most of the parents of these children are unable to follow the treatment of comprehensive cleft care due to a lack of proper feeding advice to their infants. As a result, parents faced difficulties in feeding their infants, which leads to poor nutrition and underweight. So, the first and foremost concern for these infants is to provide them good nutrition, as several studies have showed weight gaining of these infants is very slow especially in early life.[3]

Before discussing the difficulties of feeding in cleft lip and CP infant, we should know the basic mechanism of feeding and the transition of feeding needs according to the age of the infant. The first weeks after childbirth are a critical period for the mother and baby. Breastfeeding is always encouraged because breast milk is accepted the best for the nutrition of human babies up to 6 months of age. Several studies stated that mothers with lactation failure get more chances to have postpartum depression. Infant feeding caused by the rhythmic pumping action is known as "suckling." Soon after birth, the lips are not readily matured, but a primary rooting reflex exists, this is why when the child is nursed, it turns its head naturally to the breast. In breastfeeding, the baby needs to pull and suck the nipple into the mouth. After the age of 6 months, an infant needs semisolid food for proper nutrition along with breastfeeding. Bottle-feeding mechanisms differ from suckling in breastfeeding. It does not have a primitive reflex and the child needs to do positive pressure on the teat (bottle nipple) with the tongue against the upper gum pad.[4] Swallowing act is very complex and integrated by the neuromotor event that begins in intra–uterine life (IUL). The interaction between the oral and pharyngeal phases of swallowing is intimate and functional.[5] Breathing is necessary to support feeding. It provides oxygen to all of the systems. During feeding, automatic adjustments are made to respiratory rate and depth to accommodate the "work" of feeding. To swallow the milk, the infant needs to stop breathing during each swallow and then breathe after swallowing. Thus, the suck-swallow-breathe circle completes a feeding cycle.[6]

Infants who have CP or CLP need specific feeding-based anatomy and swallow physiology. They need more amount of energy in the act of feeding. These infants need an average rate of 109.26 sucks per minute, whereas infants without clefts need average of 75.07 sucks per minute. This increased energy expenditure might lead them to fatigue. As there is poor or absent inner oral pressure and weak muscle movements, it alters all phases of oral, pharyngeal, and esophageal swallowing, and

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maybe increases the risk of aspiration. For this reason, infants experience challenges to maintain respiratory coordination and airway protection in the pharyngeal phase.[7]

Difficulties for Feeding of Cleft Lip

Clefts of the lip may be unilateral or bilateral and may or may not extend into the alveolus process. In these cases, the anterior oral seal formed by the lips, tongue, and nipple will be compromised. Other oral functions should be intact. If an adequate anterior seal cannot be created with the nipple or the position of the breast, assisted milk delivery systems should be considered. If the anterior seal being broken during the feeding, typical "kissing" sounds are heard, and this may compromise intake with each suck.[8]

Difficulties for Feeding of Cleft Lip with Cleft Palate and Cleft Lip

Infants with CP/CLP use their geniohyoid and mylohyoid muscles during the oral phase that leads to decrease the movement of the tongue resulting in an extended pharyngeal phase. Sometimes, an audible swallow, milder pharyngeal wetness, and throat clearing are noticed in infants with CP/CLP.[7]

Different Methods of Feeding for Babies with Cleft Lip/Cleft Lip and Palate

The priority to the feeding of these infants is for maintaining optimum nutrition, and the second is finding a technique as close to normal as possible. Feeding interventions help to reduce the stress experienced by the infant and mother/family, promote healthy growth and development, and facilitate a normal feeding pattern.[9]

With some adjustments of normal infants feeding methods and positioning, the baby would be able to overcome all the difficulties of feeding and enjoy benefits of feeding, like bonding with the mother/caregiver, adequate nutrition for healthy growth and development before undergoing surgery for the cleft lip or the palate. Breast, bottle, long-handled spoon, or cup feeding or a combination of all may be chosen with the lactation instruction about the correct positioning of the child. Even where breastfeeding may be difficult for a baby with a CP, there is an option for the mother to express her milk and give it through the bottle.[9]

The Techniques of the Feeding of Babies with Cleft Lip

Cleft lip babies do not have a major problem with feeding; only need some modifications in positioning during the feed. In a unilateral cleft lip, the modified football method or straddle position (Fig. 1) may be helpful. In this position, the baby is with a cleft toward the breast, this allows the cleft to be tucked into the breast tissue and makes it easier for the baby. Further, supporting the infant's cheek decreases the width of the cleft and simultaneously increases the closure around the nipples. Another modified method is the "Dancer hand position" (Fig. 2), where the hand under the breast forwards to support the breast with three fingers rather than four forms a U-shape with the thumb and forefinger to cradle the baby's chin, this helps the baby to suck the nipple and areola between the gums. In all feeding positions, the baby is kept in an upright position (Fig. 3) that allows the milk to flow down and helps prevent choking. If an incorrect position is taken (Fig. 4), the milk may enter into the respiratory passage. Breastfeeding would be more difficult for babies with bilateral cleft of the lip; this is due to the inability to form an air-tight seal around the nipple. In some conditions where breastfeeding is not adequate, one can always switch on to specially designed bottles, as nutrition cannot be compromised.[9]

Fig. 1: Modified football method or straddle position[9]

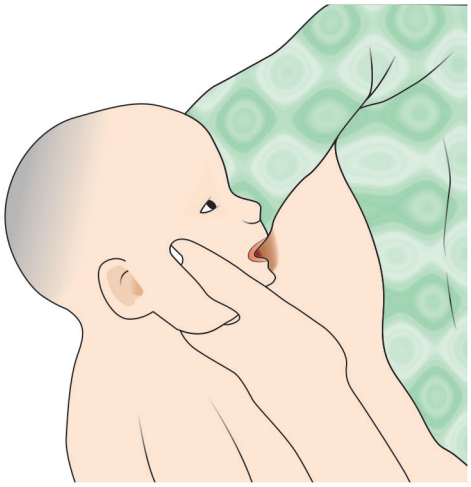

Fig. 2: Dancer hand position[9]

Fig. 3: Correct position for feeding[9]

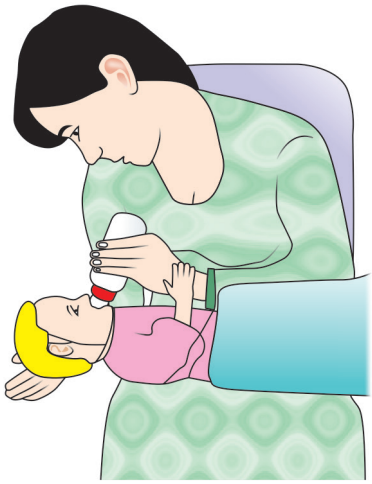

Fig. 4: Incorrect position for feeding[9]

The Technique of the Feeding of Babies with Cleft Palate

During the feeding, infants with CP/CLP tend to swallow more air. So, it's important to release this air by burping after the infant consumes each ounce. Frequent burping helps the infant avoid feeling falsely stated and reduces spitting up, reflux, and gas pain. All infants should feed in a relaxed state, but the infant with CP/CLP often feels stress while feeding. Stress can be easily identified by a furrowed brow, wide eyes, redness around brow/eyelids, the tension in the legs/arms, and/or clenched fists often held high near the face of these infants during the feeding. The caregiver or mother always needs to watch carefully for signs of aspiration during feeding. The sign of aspiration includes significant pharyngeal wetness, gagging, coughing, chest congestion, vomiting, watery eyes, and excessive nasal congestion or regurgitation not mitigated with bottle changes. Infants with the cleft lip and/or palate use compensatory swallow patterns potentially contributing to the ingestion of more air during feeding. So, more frequent burping with about every ounce consumed improves their comfort during and after feeding.[7] Managing nasal congestion during feeding supports a more comfortable feeding experience. It can be done by moving the infant to their side; hips stacked, and keeping head and shoulders slightly higher than hips. The next watch for the infant is to swallow. Then, move them slowly and gently onto their other side and watch again for them to swallow. This procedure helps to move the milk from above the palatal shelves. So, when the infant is then brought back into the feeding position, the nasal congestion should have cleared. It is important to keep the head/shoulders slightly higher than the hips when doing this maneuver to prevent the reflux from traveling into the nasopharynx.[7]

In most cases, these babies are unable to breastfeed but pediatricians are always encouraging mothers for breastfeeding. If breastfeeding is not achieving the outcomes, then it may be necessary to bottle feed as well. Various specially designed feeding bottles are available in the market nowadays. Most of these bottles have a one-way flow valve and squeezable (Fig. 5) Haberman feeder, and a Mead–Johnson nurser bottle. Pigeon nipple added some modifications having soft side and hard side with the one-way valve. Dr. Brown specialty feeding system also has a one-way flow valve that can be used with any level nipple, but one must watch

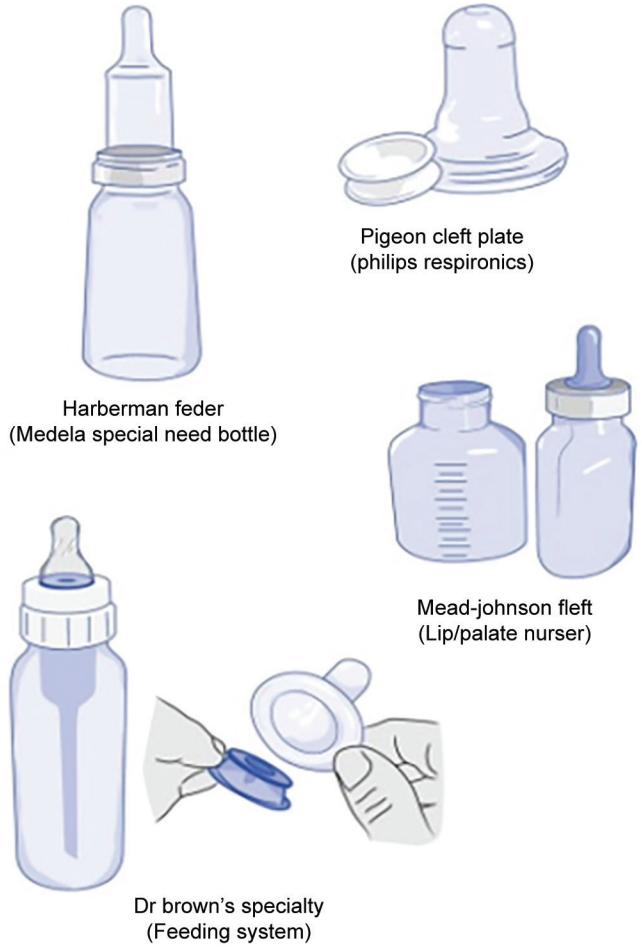

Fig. 5: Different feeding systems[9]

carefully during feeding of the baby to make sure that the breast milk or formula is not flowing too fast. All these bottles can flow milk with minimum pressure.[10]

Spoon or Cup Feeding

Jannu et al.[11] invented D-cleft (Fig. 6) which provided a good seal of palatal defect from nasal regurgitation and was found to act as a scaffold against the pressing of the feeding bottle's teat during sucking movements. This device overcomes several disadvantages presented by indwelling tubes or long-term intraoral attachment methods and can make infants free from constant irritability. This device was tried and tested successfully in many neonates born with CP. It has been successfully used to feeding neonates by their mothers/caretakers with almost no training required.[11] Before any operation to repair a CLP, the baby needs to be completely weaned from bottle drinking, because after the palate repair, the bottle nipple can rub against the stitches and break down the repair. A long-handled spoon with a flat bowl should be used in those cases. First, pabulum and cereals should be started with spoon feeding. Introduction of only one ingredient of food at a time should be done.[9]

Sometimes, all techniques failed in CP babies. They still have difficulties in feeding and may have chances of aspiration during feeding. In these cases, a feeding prosthesis is required to fulfill their feeding demand.

Fig. 6: D-cleft devices[11]

Feeding Prosthesis

The feeding plate or prosthesis fills up the cleft and the separation between the oral and nasal cavity. It creates a strong surface toward which the baby can press the nipple and extract the milk.[16] It assists in feeding and reduces the incidence of choking and nasal regurgitation. The obturator holds the tongue from entering the defect.[17] Feeding appliances have been mentioned by several authors in different times. An affected infant cannot produce a sufficient negative pressure in the oral cavity that needs for swallowing.[18] Feeding plates (Fig. 7) have been modified using different materials like the Bioplast clear soft palate (Ethylene-vinyl acetate) and Tulle.[17] The feeding appliance is usually made by a heat-cure clear acrylic resin. The appliance should be properly trimmed; borders are rounded and polished to avoid trauma to the surrounding tissue. For emergency purpose, an elastic or thread is attached to the appliance, and the mother/caregiver is asked to hold the appliance against resistance using the thread while feeding to avoid swallowing.[12] The drawback of the feeding plate mainly is the requirement of fabrication of new ones from time to time because of the growth of infants. Also, good oral hygiene and the cleanliness of prostheses should be maintained failing in which fungal growth on the palate can be seen.

To summarize, apart from the proper feeding positions, the following instructions should also be given to the parents.

- Feed at least 8–12 times in 24 hours.
- Feeding limit to less than 30 minutes and not to be exhaustive.
- Do burping 2–3 times during feed.

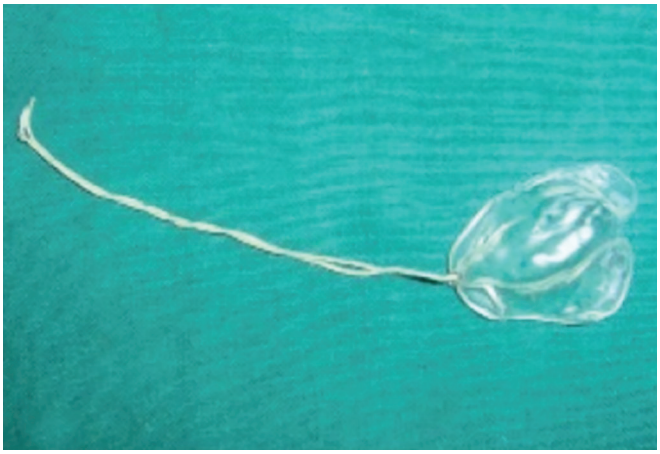

Fig. 7: Example of a feeding plate of a cleft lip and/palate infant[17]

- Oral hygiene maintenance, for example, gum pad and prosthesis if given.
- Sterilization of feeding bottles, nipples, and cups.
- Reassurance the mothers to take patience as babies with clefts take a longer time to feed.

A protocol should be maintained to examine the growth and development of babies with a cleft.[9]

Goyal et al's study shows that spoon feeding was the most common feeding practice method noted, and breastfeeding was the second-most common feeding practice method among cleft patients in India.[13] Ravi et al[14] a survey to compare three feeding techniques in Indian cleft patients, noted that paladai feeding is better than bottle or spoon feeding for infants' weight gain. Gopalakrishna and Agrawal's survey on cleft management shows that Indian pediatric doctors advise using the spoon as the primary feeding appliance. The feeding techniques of children with CLP seem to be entirely different in India concerning the other developed countries. Bottle feeding is not encouraged by the pediatric physician as it requires cleaning and asepsis. Many feeding appliances are costly, imported, and not easily available in urban and rural areas of India. That's why feeding with spoon and indigenous appliances is preferred to bottle feeding.[15]

Conclusion

Breast milk is the best choice of food for an infant under 6 months of age. With some modified positioning of baby and breast, cleft lip and/palate infants and babies can enjoy all the advantages of breastfeeding. In India, paladai and spoon feeding are more popular than bottle feeding due to the cost effectiveness of the bottle. On the other hand, Pedodontics can make a feeding plate to ensure effective feeding of these babies. Primary cleft surgeries are very important for comprehensive cleft care treatment for long-term esthetical and growth of the orofacial structure. Effective feeding leads to healthy growth and development of babies so that they can undergo primary cleft surgeries at the actual time.

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