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A Case Report: Combination between Millard Technique and Paranasal Flap in Unilateral Cleft Lip and Palate

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Abstract:- Background: Cleft lip and palate, are spaces or gaps in the alveolus, palate, or upper lip. They are the most common congenital anomaly of the orofacial region with etiologies rooted in genetic and environmental factors. As the result of these structural abnormalities, patients with cleft lip and palate have speech difficulties, feeding problems, reduced nasal airflow, and aesthetic issues. Patient with cleft lip and palate need to be treated at the appropriate time and age to achieve functional and aesthetic well-being. Case History: A 4-month-old male, born with cleft lip up the nostrils, upper gum and palate on left side, experienced feeding difficulties, came to DR. H. Moch Ansari Saleh Hospital Banjarmasin. The patient then underwent a modified Millard technique with paranasal flap. Conclusion: The modified Millard technique and paranasal flap can be considered a viable option for treating unilateral cleft lip as it provides good aesthetic results by minimizing lip scarring. Although primary nasoplasty remains controversial, primary nasoplasty during cleft lip repair gives good results with limited or no effect on nasal growth. When the patient reach 9-months old, another surgery to restore the palate was scheduled.

Keywords:- *Cleft Lip and Palate, Modified Millard Technique, Paranasal Flap, Reconsctrution.*

I. INTRODUCTION

Congenital malformations are based on anatomical abnormalities that occur during embryogenesis. The process of embryogenesis is associated with the development of a tissue or organ that slows or stops, leading to aberrant results in the form of persistent structural abnormalities. There are several types of craniofacial malformations based on their location and morphogenesis. One of the malformations of the skull and face is cleft lip and palate. [1]

Cleft lip and palate is the most common congenital anomaly of the orofacial region. It can occur alone or with other congenital abnormalities. The prevalence of cleft lip and palate worldwide is 1 per 700 live births. Patients with cleft lip and palate need to be treated at the appropriate time and age to achieve functional and aesthetic well-being. Management of children with cleft lip and palate requires interprofessional collaboration by a number of different specialties including plastic surgeons, pediatricians, ENT doctors, pediatric dentists, orthodontists, prosthodontists, speech therapists, geneticists, and psychologists as this congenital disorder requires years of specialized care.[1,2]

The writing of this case report aims to provide an overview and management of lip repair with the modified Millard technique followed by paranasal flap.

II. CASE STUDIES

A 4 months old male infant referred to DR. H. Moch Ansari Saleh Hospital with cleft lip, upper gum and palate since birth. The patient often choked when getting breast milk directly from his mother. Complaints of cough, runny nose, fever, shortness of breath, ear discharge, ear pain were denied. History of congenital heart disease and allergies were denied. There were no family history who had similar complaints as the patient. During pregnancy, his mother had a history of taking ibuprofen.

A physical examination of the patient found a complete cleft lip up to the nostrils on the left side, cleft on the alveolar bone, and cleft on the palate durum and mole. A through examination was carried out for the preparation of general anesthesia including routine blood test (hemoglobin, erythrocytes, leukocytes, platelets, BT, and CT), and chest X-rays. The test results are within normal limit except the hemoglobin was 9.4g/dl.

III. DISCUSSION

Spaces or gaps in the alveolus, palate, or upper lip may be present at birth as a congenital abnormality known as cleft lip and palate. Variegated gaps in the nasal floor, alveolus, and lips are the outcome of cleft lip, which occurs when the frontonasal and maxillary processes fail to fuse. In a cleft palate, the palate durum and/or mole are separated because the palatal part of the maxillary processus did not fuse properly. The outcome is a hole in the palate that serves as a direct conduit between the oral cavity and the nasal passages.[1]

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On this case, this patient has suffered from left-sided cleft lip, which extends to the nostrils, alveolar bone and palate, has complained of choking on breast milk on a regular basis from birth. About 70% of unilateral clefts happen on the left side of the face, and the prevalence of unilateral clefts is four times higher than that of bilateral clefts. There is a 2:1 reported ratio of boys to girls for cleft lip and palate, and the severity of these cases is higher in boys. Both hereditary and environmental factors, including maternal sickness, some drugs (such as aspirin, ibuprofen, antihistamines, and rifampicin), and malnutrition, contribute to the development of cleft lip and palate. Cleft lip and palate are more common in families when the condition runs in the family. Some other variables that might raise the likelihood of cleft lip and palate include being over the age of 30, not getting enough folic acid in diet, having a history of trauma during the first trimester of pregnancy, being exposed to radiation while pregnant, and having certain Sexually Transmitted Disease (STD) like syphilis and rubella.[1,3,4]

Problems with feeding are the first sign that a baby has arrived. A cleft palate makes it abnormal for a baby to be able to suckle from their mother's breast. The capacity of the outside lips to make a sucking action and the ability of the palate to permit the required rise in oral pressure to force food particles into the mouth are the two components that determine an infant's suctioning ability.

The "rule over 10" for cleft lip surgery specifies that the baby should be more than 10 weeks old, 10 pounds, and 10 g/dL hemoglobin before the procedure may be considered.[5] However, for the best possible speaking results after cleft palate surgery, it is best to wait until the child is 9 to 12 months old. This gives the scar tissue time to mature, which helps it to soften. Postponing cleft palate surgery after this window can raise the likelihood of speech impairment.[6]

Despite the patient's hemoglobin level being 9.4 g/dL, the procedure went forward. The "rule over 10" is not a gold standard. Decision-making is based on the patient's overall physiological status, the surgeons, anesthesiologist's experience, and the center's postoperative care facilities, according to a recent study that evaluated its relevance as a preoperative determinant for patients undergoing cleft and lip repair.[7]

Two of the most popular surgical procedures for repairing unilateral cleft lips are the triangular flap method (also called the Tennison-Randall technique) and the rotation-advancement technique (also called the Millard technique) (Figure 1). Patient heterogeneity, gap size, and assessment duration determine the relative merits of the two methods. In an effort to achieve successful surgical results, several surgeons nowadays have used various methods to repair cleft lip. The goal of the procedure is to create an uneven upper lip shape with philtrum column lengths that seem natural. It should mirror the other side, not go beyond the philtrum column, and not have vermillion notch in order to conceal the scar tissue.[6]

A paranasal flap and a modified Millard method were used to fix the patient's cleft lip (Figure 2).[8] To compensate for the limitations of each method, the Millard design was tweaked with Tennison's input. Though they provide distinct outcomes, the two methods rely on the same geometric foundation (Figure 3). Geometric considerations and the restoration or reconstruction of natural anatomical components should guide the design of a successful cheiloplasty.[6]

To conduct the Millard procedure, one rotates the flap on the medial portion of the cleft and then uses the lateral section to generate a continuation flap.[5] One of the most common methods for restoring cleft lips is the Millard procedure, which may replicate the philtrum column on the cleft side. Some side effects of the conventional Millard procedure include vermilion notching, small lips, and scar tissue contraction.[5,6] Scar tissue contraction, insufficient orbicularis oris muscle strength, skin inversion at the suture line, and insufficient rotation are the potential causes of vermillion notch, a discontinuity at the vermillion free boundary.[9] Avoiding the vermillion notch and lengthening the shortest side of the lip is possible with a triangular flap (Tennison procedure) inserted from the side.[10]

Although the Classic Millard method is known for its vivid red strokes and straight line scars, it does have one drawback, it may injure the lip mucosa and tissue and cause tiny nostrils if the lateral lip segment has a lesser vertical height. The Tennison procedure leaves behind scars in the form of barely visible zigzag lines with very little hypertrophic tendencies. One drawback of the Tennison Technique is the production of scars on the philtrum in the bottom third, which might lead to lips that are too lengthy vertically. So, to fix the nasal malformation, this modified Millard approach involves creating two closure points along the base of the nostrils and bringing them together. Parallel lines are drawn from these two spots to the medial cupid's bow and the lateral triangle fold, respectively. Therefore, it is anticipated that the Millard approach, as modified with Tennison, would provide superior outcomes.

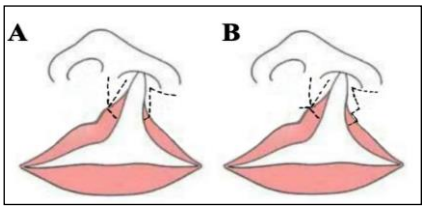

Fig 1. A. Classic Millard Technique B. Modified Millard Technique[6]

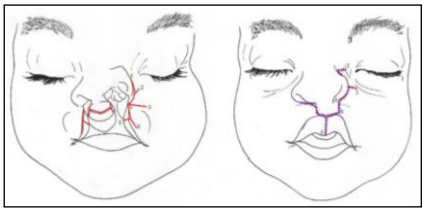

Fig 2. Modified Millard Technique with Paranasal Flap[8]

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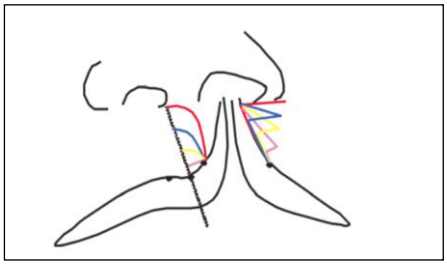

Fig 3. Geometric Lines of the Classic Millard Technique (Red Line) and Tennison Technique (Purple Line)[6]

As a result of structural abnormalities, patients with cleft deformities have both aesthetic issues and reduced nasal airflow. Nasal abnormalities such as a very short columella, septal deviation, a downwardly turning nasal tip, and decreased nasal projection are common in people with cleft lip.[11] Unilateral cleft lip is characterized by a distinct malformation of one side of the nose, affecting both the bony and soft tissues of the nose. The primary cause of the deformity, which is directly correlated with the severity or breadth of the cleft, is a shortening of the columella, as well as the medial crus of the lower lateral cartilage. When the maxillary bones are underdeveloped, the asymmetry caused by the orbicularis oris muscle's improper insertion becomes much more noticeable. The orbicularis oris fits horizontally onto the columella in healthy lips. On the other hand, the orbicularis oris inserts discontinuously into the columella on the side of the body that is not affected by cleft lip. As a consequence, the septum in the nasal airway on the cleft side bends due to a force that pushes the columella and caudal nasal septum to the uncleft side. The ala is already pushed backwards by the inadequate maxillary structure at the base of the jaw, and it becomes worse. The lower lateral cartilage on the cleft side has an uneven form, which causes the nose tip to be asymmetrical. The medial crus is narrower and less distinct on the cleft side, whereas the lateral crus is longer and more expansive.[12]

This patient also had a paranasal flap. On the upper lip, an incision was made along the philtrum column. The blood supply (inferior labial artery) was preserved to reconstruct the soft-tissue defect at the lateral nasal wall and create an upper lip. Incision was made on the junction of left upper and lower alar cartilage, dissection was made to release the connective tissue between them. After get released, the lower alar cartilage was repositioned. A left paranasal flap was raised and transpositioned from the left lateral alar to close the defect at one left side of the nose after approximating the edge. The muscle, subcutaneous, and mucosal were sutured using PGA 5-0 and skin with nylon 6-0.[8]

Primary nasoplasty, which in this patient is paranasal flap, done at the time of cleft lip repair, intermediate nasoplasty is done between the ages of 5 and 11, and definitive nasoplasty is done after the child reaches bone maturity at 16 years of age, although the exact timing of these procedures is still up for debate.[13] Given the potential impact on the nose and maxilla's long-term growth, the precise time of primary nasoplasty is still up for debate. When it comes to cleft correction, some surgeons believe that doing a primary nasoplasty doesn't really reduce the need for further procedures, and in fact makes them more difficult to do in the future because of the scarring that occurs in the nose. However, there are medical professionals who maintain that initial nasoplasty is crucial.[14] Taking advantage of the malleability of the nasal cartilage and soft tissues is the foundation of nasoplasty in infants. Proponents of primary nasoplasty argue that the procedure may mitigate the psychological and social effects of birth defects, lessen the severity of nasal malformations, and cut down on the frequency of revision procedures needed later in life.[13] According to a new meta-analysis, primary nasoplasty produces satisfactory outcomes with little to no impact on nasal development when performed during unilateral cleft lip surgery.[15]

The patient was released from the hospital after round one of postoperative monitoring revealed no problems (Figure 4). When the infant was nine months old, another treatment to restore the palate was scheduled.

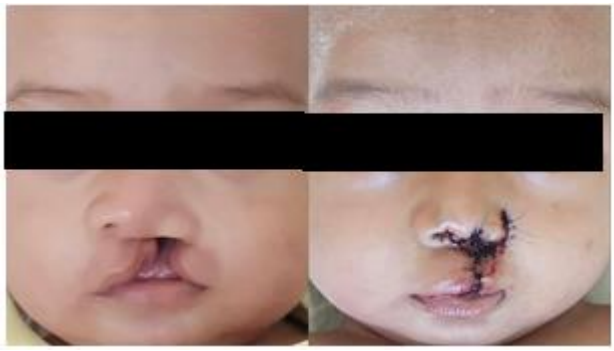

Fig 4. Clinical Features of Pre and Post Cheiloplasty and Nasoplasty

IV. CONCLUSION

Cleft lip and palate is the most frequent congenital anomaly of the orofacial region and is the most severe congenital anomaly affecting the mouth and surrounding structures. The first operation of cleft lip is usually performed at 3 months of age after exclusion of other congenital anomalies. Millard's modified technique is a commonly used technique as it provides good aesthetic results by minimizing lip scarring. Although primary nasoplasty remains controversial, recent systematic reviews have shown that primary nasoplasty during cleft lip repair gives good results with limited or no effect on nasal growth.

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