International Journal of Dentistry Research

Case Report

ISSN: 2581-3218
IJDR 2025; 10(2): 36-39
Received: 20-02-2025
Accepted: 13-07-2025
Published: 31-08-2025

www.dentistryscience.com
doi: 10.31254/dentistry.2025.10202

A New Era in Cleft Care: Discovery of a Novel Type and Targeted Treatment- A Case Report

Prachi Vaish[1], Mayank Goel[1], Afroz Alam Ansari[1], Priyambadha H. Subba[1]
[1] Department of Paediatric and Preventive Dentistry, Faculty of Dental Sciences, King George's Medical University, Lucknow- 226003, Uttar Pradesh, India

Abstract

Presurgical orthopaedic interventions are essential in managing neonates with cleft lip and palate. While cleft lip and palate are treatable, the specific approach depends on the type and severity of the condition. Nevertheless, the case outlined below features a distinctive combination of clefts that doesn't conform to any recognized classification. The child had cleft involving only the lip and soft palate sparing the hard palate. Thus, the management had to be more towards a conservative approach to reduce trauma and improve the health of a child. In response to patient's specific needs, we have created a novel, personalized NAM device. This appliance greatly lessens the necessity for regular visits to the craniofacial clinic. We present a case in which a newborn, before undergoing lip surgery, received treatment with a nasal elevator device and adhesive strips for three months. In conclusion, NAM therapy and nasal elevation, successfully minimized the cleft width and improved the nasal framework. This report seeks to emphasize a new type of cleft, an innovative therapeutic approach, and its practical implementation.

Keywords: Cleft lip and palate, Novel type, Neonate, Paediatric dentistry.

***Corresponding author:**
Dr. Prachi Vaish
Junior Resident, Department of Paediatric and Preventive Dentistry, Faculty of Dental Sciences, King George's Medical University, Lucknow- 226003, Uttar Pradesh, India
Email: prachipedo@gmail.com

INTRODUCTION

Cleft lip and palate (CLP) are the most common congenital anomaly affecting the craniofacial region, arising from disrupted facial development during gestation. According to the global epidemiological survey, one newborn in every 600 suffers from cleft palate, incidence being highest among the Asians followed by Caucasians and Africans. The incidence in India was reported to be over 3500 CLP/year [1].

Over the past 70 years, numerous classification systems for cleft lip and palate have been developed, though only a few have gained broad clinical acceptance. Four of the more accepted schemes include Davie & Ritchie classification, Veau classification, Kernahan and Stark Symbolic Classification and the recent International Confederation of Plastic and Reconstructive Surgery classification. The case presented below had a unique combination of clefts not falling specifically under any of the given classification. The child had cleft involving only the lip and soft palate sparing the hard palate. Thus, the management had to be more towards a conservative approach and patient specific.

Presurgical infant orthopaedic procedures are crucial in the early management of newborns with cleft lip and palate. The evolution of modern presurgical methods began with McNeil in 1950, who used buccal plates to direct the segments to their proper positions [2]. In 1988, Matsuo and colleagues were the first to present a nonsurgical technique for addressing nasal deformities, employing silicone tubes to shape the nostrils [3]. Expanding on the concept of the high plasticity of neonatal nasal cartilage, Grayson and colleagues [4] developed an intraoral molding plate with nasal stents to effectively align the alveolar ridges.

Traditional NAM involves taking impressions from newborns, a process that can be quite difficult. Therefore, it is crucial to find alternative methods that address this challenge. Monasterio et al. were pioneers in reporting the use of a plastic-coated paperclip as a nasal elevator, along with an elastic band secured to the forehead to position the cleft segments correctly [5]. Moreover, because nurses can make the necessary adjustments, the requirement for a dental specialist is removed, which greatly decreases chair side time and costs associated with treatment.

CASE REPORT

A one-month-old child with a cleft lip and palate was referred to the Department of Paediatric and Preventive Dentistry. The child's medical history was unremarkable, and the birth weight was 2.14 kg. The mother, aged over 35, also had no significant medical history. There was no family history of cleft lip or palate among the siblings.

Upon extraoral and intraoral examination, the child was found to have a unilateral cleft lip on the right side, collapsed nostrils and columella, a deviated nasal septum toward the right side, and a cleft of the soft palate only.

The parents were informed about the treatment procedure, its duration, and provided their informed consent. Active NAM therapy was conducted for 3 weeks, followed by passive retention for approximately 3 to 4 months, as the child was scheduled for lip surgery at 5 to 6 months of age.

Treatment

An impression of the maxillary arch was taken using condensation silicone (Coltene Speedex Light Body Elastomeric Impression Material). This impression was then poured using Type III dental stone. To ensure the child's safety during the procedure, gentle pinching was used to induce cry, and the child's head was positioned downward to prevent any material from flowing into the throat. Maxillary models were created at the beginning of the treatment and prior to surgery. The impression was taken only once for record-keeping purposes.

The nasal device's core was made using 19-gauge stainless steel wire, shaped similarly to a hockey stick. One end of the wire was crafted to hold the ala in its corrected position, while the opposite end was shaped into a triangle to secure the tape (Figure 1a). After achieving the desired form, the wire was coated with self-cure acrylic (RR Cold Cure, DPI, Mumbai, India). The device was then polished and finished with stone burs using a straight handpiece and fine-grit sandpaper. This design was intended to prevent trauma from the wire, improve hygiene, and lower the possibility of nasal and upper respiratory infections.

The device was checked for proper fit on the baby. The appliance blade was carefully inserted into the nose and extended over the forehead. Once the desired alar height was achieved, the triangular wire section was secured with tape on each side (Figure 1b). The procedure was thoroughly explained to the parents, and they were instructed to clean the device regularly with lukewarm water. The child was scheduled for routine follow-up visits leading up to the surgery at 5-6 months of age.

Figure 1: 1a. A 19-gauge wire was used to design the nasal elevator. As it is shown in the schematic picture, the tip was made hockey stick shape by covering with acrylic, crafted to hold the ala in its corrected position. Other end was made triangular shape to secure the tape. At last, micropore tape was attached to the triangular end for fixation to the frontal area. **1b.** A 28-day old neonate with a unilateral cleft lip and palate treated with Nasal elevator and micropore tape

Outcome and Follow-Up

The patient was observed on a weekly basis to evaluate the nasal elevator (Table 1, Figure 2). After the NAM therapy, the patient had lip surgery to fully reconstruct the lip and nose.

Table 1: Nasal measurements

Vertical Dimension	**Preoperative**	**Postoperative**	**Outcome**
a. Nostril height (mm)	0.22	0.9	Increased
b. Nasal dome height (mm)	0.91	1.9	Increased
c. Columellar angle (degree)	21.8	32.46	Increased
Horizontal Dimension			
d. Nostril basal width (mm)	2.5	1.7	Decreased
e. Nostril width (mm)	2.1	1.3	Decreased

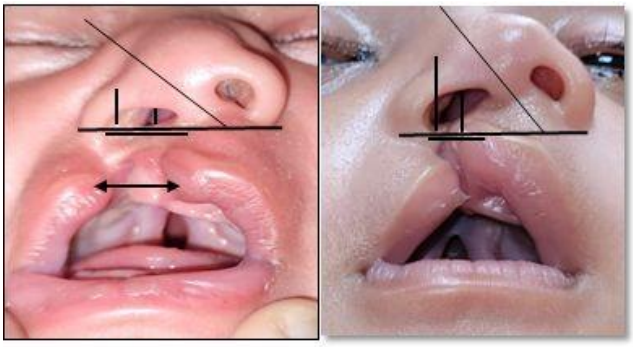

Figure 2: Photographic measurements of the Nostril height (mm), Nasal dome height(mm), Nostril basal width(mm), Nostril width(mm), columellar angle (degree), width of cleft lip in a patient with right cleft lip and palate before and after treatment

DISCUSSION

Cleft lip and palate (CLP) are a congenital anomaly that significantly affects facial morphology, feeding, speech, and social integration. Proper categorization of CLP is crucial for effective clinical documentation, treatment approaches, and research efforts. Current classification systems, including the Kernahan "striped Y" diagram, the Veau system, and the LAHSAL framework, adequately address most known variations of clefts. However, recognizing or suggesting a new subtype of unilateral cleft lip and palate that does not align with these established categories necessitates additional examination. This discussion delves into the potential ramifications, challenges, and essential steps involved in proposing such a new subtype.

Various types of clefts affecting the lip and palate have been observed and categorized into different classification systems. However, the current case presented with a unique combination involving only lip and soft palate. Therefore, the treatment plan needed to be modified to suit the case and improve the overall health of the child.

Presurgical infant orthopaedic procedures help minimize the need for future surgeries and reduce the necessity for alveolar bone grafting [3,6]. One key benefit of the presurgical NAM device is that it not only facilitates molding but also acts as a feeding plate[2], supporting newborn feeding and aiding in the development of the essential suckling reflex. NAM therapy involves three phases: retraction of the premaxilla, repositioning the tips of the alar cartilages, and lengthening the columella [3].

The flexibility of cartilage in infants enables the adjustment of nasal cartilages. This short-term pliability is thought to stem from elevated levels of hyaluronic acid, a key element of the proteoglycan intercellular matrix, which remains present in infants for several weeks following birth. For individuals with cleft lip and palate, lengthening of the columella should be performed within the suggested window of about 5 to 6 months [3,7-9]. Consistent follow-up appointments and gradual, careful modifications of the appliance can lead to more efficient and rapid results.

A research study conducted by Liao et al. [10] indicated that patients with complete unilateral cleft lip and palate displayed different levels of efficacy, efficiency, and complication rates with the two types of nasoalveolar molding (NAM) techniques. By recognizing these differences, surgeons and orthodontists can better handle patient discussions and establish realistic expectations for outcomes [10]. Monasterio utilized a nasal elevator along with DynaCleft rather than an intraoral appliance featuring a nasal stent for NAM. This method removed the necessity of obtaining impressions of the newborn, simplifying the management process. In standard NAM, the appliance has a direct impact on the maxillary flanges, while the nasal elevator exerts influence on the maxillary segments indirectly via the traction pressure of the lip. Nonetheless, it is essential to mention that opting for DynaCleft raises the cost of treatment. In our situation, we chose to use Tegaderm tape (3M, USA) and micropore tape as alternatives to DynaCleft to make the treatment more cost-effective for the patient's family.

In contrast to traditional devices previously used, this device presents several significant benefits. Since it does not include an acrylic plate in the mouth, it does not hinder feeding, supports better oral hygiene, and is more easily accepted by the child. Furthermore, as the device is used solely on the nose, it does not have to be taken out after feeding or during sleep, which helps to shorten the overall treatment time. For patients with unilateral cleft lip and palate (UCLP), these adjustments result in enhanced nasal symmetry prior to the primary lip and nasal surgery.

Ezzat et al. [11] carried out a study examining the impact of presurgical nasoalveolar molding (PNM) on patients who have a unilateral cleft lip and palate, initiating the treatment at 24 days of age and lasting for an average duration of 110 days. They determined that PNM therapy led to significant enhancements in nasal symmetry by decreasing columellar deviation, elevating nostril height on the affected side, maintaining bialar width, widening columellar width, and achieving more symmetrical heights and widths of the nostrils [4]. Similarly, in the current case, treatment commenced at 28 days and lasting for an average duration of 121 days. Importantly, noticeable improvements in nasal symmetry were detected within 2-3 weeks (Figure 3), although the passive phase of treatment continued until the scheduled surgery. Results were remarkable after the surgery with this novel approach (Figure 4).

As shown in Figure 3, the cleft width was reduced, and the nasal architecture improved. No complications were observed during the treatment or follow-up sessions. Therefore, our study demonstrates that NAM, combined with nasal elevation, can significantly reduce cleft width and enhance nasal architecture.

Figure 3: Result of treatment at 3 months of age, before surgery

Figure 4: Result of treatment at 5 months of age, after surgery

CONCLUSION

This case highlights a rare and previously unclassified cleft presentation involving only the lip and soft palate with sparing of the hard palate. The use of a novel, patient-specific nasal elevator device combined with NAM therapy proved to be a safe, practical, and effective presurgical intervention. This approach successfully reduced cleft width, improved nasal architecture, minimized the need for frequent clinic visits, and enhanced overall parental satisfaction. Unlike conventional NAM appliances, this device offered the advantages of better oral hygiene, uninterrupted feeding, and ease of use at home, making it highly adaptable for resource-limited settings. The findings suggest that such innovative, minimally invasive interventions can complement traditional cleft care protocols, particularly in unique or atypical presentations. Further clinical validation with larger cohorts is warranted to establish its broader applicability and potential role in refining cleft care strategies.

LEARNING POINTS

1. The article highlights the significance of tailoring treatment plans based on the specific needs of the patient. The case presented involved a unique combination of clefts that didn't fall under any recognized classification, emphasizing the need for individualized care.

2. The study demonstrates how simpler, non-invasive devices such as nasal elevators and adhesive strips can be used effectively instead of traditional, more invasive techniques. This not only reduces treatment costs but also improves patient comfort and ease of use for caregivers.

3. CLP is a prevalent congenital anomaly, and understanding the varying degrees of severity and classification systems (e.g., Veau, LAHSAL) is essential for effectively managing these cases. The article's approach to

individualized treatment is applicable in various healthcare settings globally.

Patient Perspective

The patient expressed satisfaction with the treatment received and reported significant relief from the spontaneous pain and sensitivity that initially brought him to the clinic. He noted that the procedure was comfortable and that the dental team kept him well informed at every stage of the treatment. The patient appreciated the explanation provided about the unusual root canal anatomy and was reassured by the careful approach taken to ensure all canals were treated. He reported no post-operative complications and expressed confidence in the outcome, mentioning that he would recommend similar care to others if needed.

Conflicts of Interest

The author reports no conflicts of interest.

Funding

None declared.

REFERENCES

1. Patel D, Goyal R, Puri T. Presurgical nasoalveolar moulding—an adjunct to facilitate surgical repair in infants with cleft lip and palate. Modern Plastic Surgery. 2013;3(1):34-42.
2. McNeil CK. Orthodontic procedures in the treatment of congenital cleft palate. Dent. Record. 1950;70:126-32.
3. Matsuo KH T. Nonsurgical correction of cleft lip nasal deformity in the early neonate. Ann Acad Med Singap. 1988;17:358–65.
4. Grayson BH, Garfinkle JS. Early cleft management: the case for nasoalveolar molding. American Journal of Orthodontics and Dentofacial Orthopedics. 2014;145(2):136.
5. Monasterio L, Ford A, Gutiérrez C, Tastets ME, García J. Comparative study of nasoalveolar molding methods: nasal elevator plus DynaCleft® versus NAM-Grayson in patients with complete unilateral cleft lip and palate. The Cleft Palate-Craniofacial Journal. 2013;50(5):548-54.
6. Subramanian CS, Prasad NK, Chitharanjan AB, Liou EJ. A modified presurgical orthopedic (nasoalveolar molding) device in the treatment of unilateral cleft lip and palate. European Journal of Dentistry. 2016;10(03):435-8.
7. Matsuo K, Hirose T. Preoperative non-surgical over-correction of cleft lip nasal deformity. British journal of plastic surgery. 1991;44(1):5-11.
8. Matsuo K, Hirose T, Tomono T, Iwasawa M, Katohda S, Takahashi N, et al. Nonsurgical correction of congenital auricular deformities in the early neonate: a preliminary report. Plastic and reconstructive surgery. 1984;73(1):51.
9. Matsuo K, Hirose T, Otagiri T, Norose N. Repair of cleft lip with nonsurgical correction of nasal deformity in the early neonatal period. Plastic and reconstructive surgery. 1989;83(1):25-31.
10. Liao YF, Wang YC, Chen IJ, Pai CJ, Ko WC, Wang YC. Comparative outcomes of two nasoalveolar molding techniques for bilateral cleft nose deformity. Plastic and reconstructive surgery. 2014;133(1):103-10.
11. Ezzat CF, Chavarria C, Teichgraeber JF, Chen JW, Stratmann RG, Gateno J, et al. Presurgical nasoalveolar molding therapy for the treatment of unilateral cleft lip and palate: a preliminary study. The Cleft palate-craniofacial journal. 2007;44(1):8-12.

HOW TO CITE THIS ARTICLE-
Vaish P, Goel M, Ansari AA, Subba PH. A New Era in Cleft Care: Discovery of a Novel Type and Targeted Treatment- A Case Report. Int J Dent Res 2025; 10(2):36-39. doi: 10.31254/dentistry.2025.10202