Incomplete cleft palate repair with plane-based coping technique. A case report

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Case Report

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Background: Cleft palate represents one of the most frequent congenital craniofacial malformations, with the incomplete soft cleft constituting a distinct anatomical variant limited to the posterior palate. Although clinically less extensive than complete forms, this condition entails significant functional repercussions, particularly in speech, swallowing, and hearing, requiring precise surgical correction and multidisciplinary management. We present the case of an 18-month-old female with a partial soft cleft palate who underwent surgical repair through layered dissection and closure, achieving satisfactory intraoperative results with minimal bleeding. This case highlights the importance of early diagnosis, detailed anatomical evaluation, and careful surgical planning to optimize velopharyngeal function. Despite optimal surgical repair, complications such as fistulas, dehiscences, or persistent velopharyngeal insufficiency may arise, necessitating complementary interventions including speech therapy or secondary procedures. Long-term outcomes are best achieved through coordinated multidisciplinary follow-up, ensuring both functional rehabilitation and psychosocial well-being.

KEY WORDS: Cleft palate, Velopharyngeal insufficiency, Palatoplasty

Cleft palate is one of the most common congenital malformations of the craniofacial complex. Within this spectrum, incomplete soft cleft represents an anatomical variant in which the cleft affects only the posterior portion of the palate, without extending into the hard palate. Although it may appear clinically less severe than other complete forms, its functional implications, especially in speech, swallowing, and hearing, are significant and warrant a meticulous surgical approach and multidisciplinary management.

From an embryological perspective, the formation of the secondary palate occurs between the sixth and ninth week of gestation. This process involves the elevation, approximation, and fusion of the lateral palatine processes. Lack of fusion in the posterior segment generates an isolated cleft of the soft palate, the etiology of which can be multifactorial, including genetic and environmental factors, as well as associated syndromes, such as Pierre Robin syndrome or velocardiofacial syndrome [1,2].

Various classification systems allow categorizing this type of cleft. One of the most widely used is the Veau system, where type I corresponds specifically to clefts of the soft palate without extension into the hard palate [3]. Other classifications, such as the LAHS system or the Kernahan and Stark system, are also useful for clinical documentation and surgical planning.

Anatomically, the soft palate is made up of a complex muscular and aponeurotic system whose integrity is essential for velopharyngeal function. Among the muscles involved are the levator veli palatini muscle, which is key in closing the velopharyngeal sphincter during speech and swallowing, as well as the tensor veli palatini, palatoglossus, and palatopharyngeus muscles. In cleft soft palates, there is disinsertion and malposition of the levator muscle, which significantly compromises its function [4].

Clinically, these patients may present with difficulties from the first days of life. Sucking disturbances, episodes of nasal regurgitation, and recurrent middle ear infections (due to Eustachian tube dysfunction) are common findings. However, the most evident long-term sign is hypernasality of speech, caused by velopharyngeal insufficiency (VPI) [5].

The diagnosis of this condition requires a detailed evaluation that includes direct clinical examination, as well as complementary tools such as nasopharyngoscopy, imaging studies (such as MRI to assess muscle anatomy), and audiological testing. Phoniatric assessment is essential, particularly in the presurgical phase [6].

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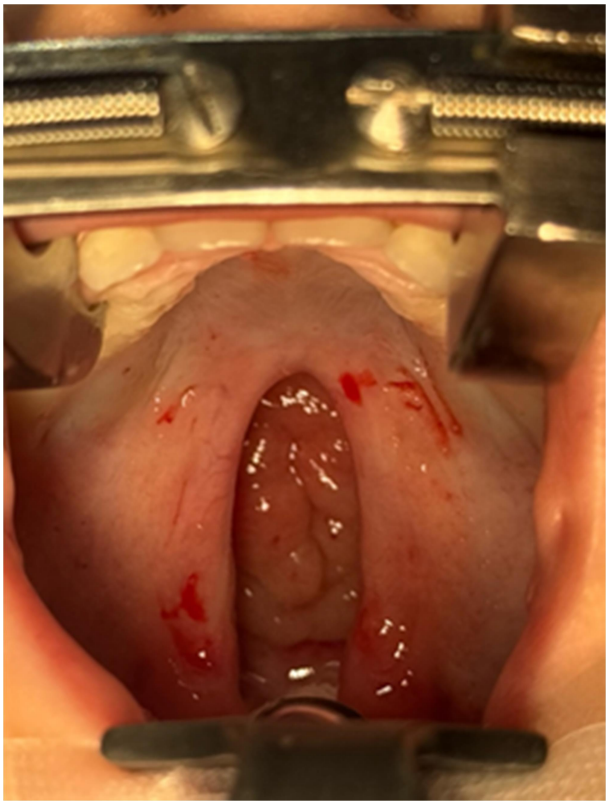

Figure 1. Presence of partial soft cleft palate demonstrated with a retractor.

Treatment is primarily surgical. The ideal age for repair is usually between 9 and 12 months of age, aiming for functional reconstruction before the active development of expressive language [7]. There are multiple surgical techniques described, one of the most

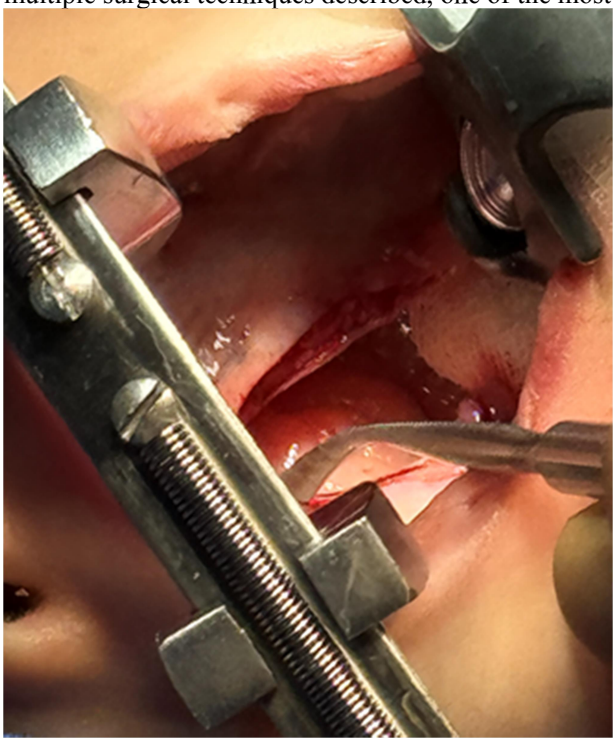

Figure 2. Dissection of the mucosa to visualize all layers of the soft cleft palate.

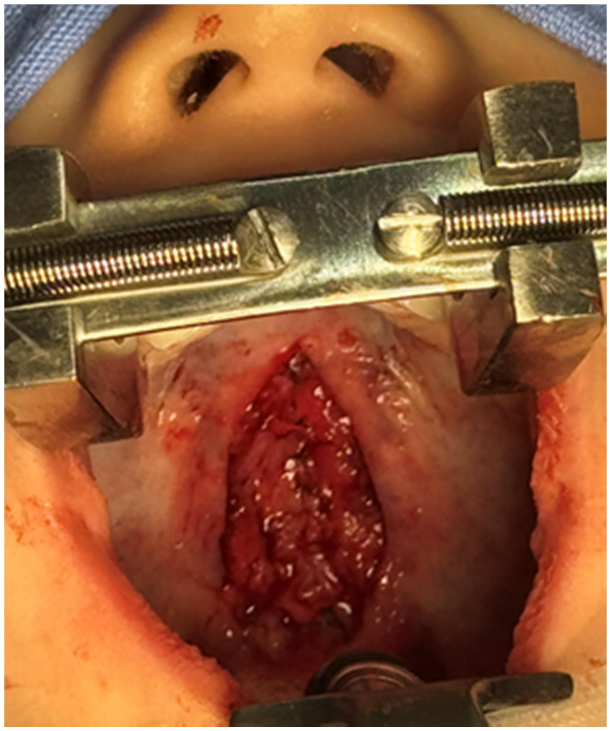

Figure 3. Tension-free muscular plane coping with absorbable suture.

accepted being intravelar velar palatoplasty (IVVP), which seeks proper anatomical realignment of the levator muscle to restore the function of the velopharyngeal mechanism [8]. The Sommerlad

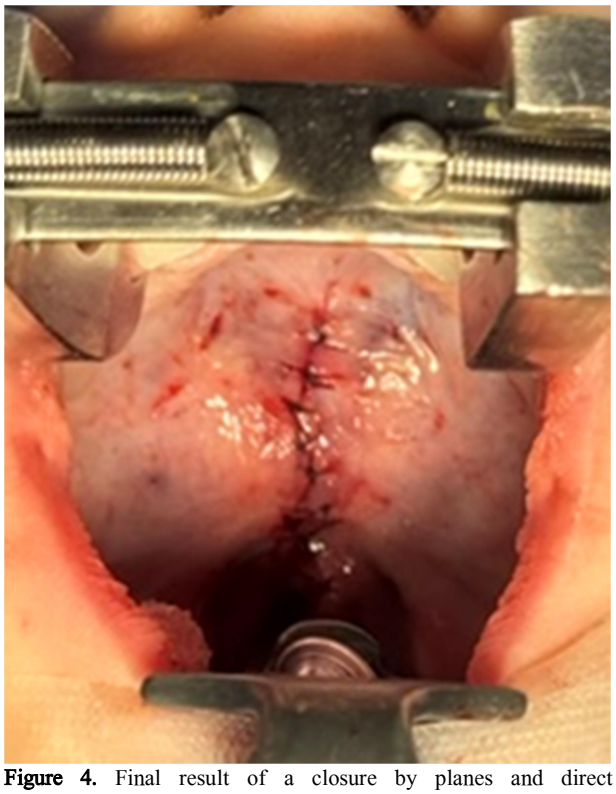

Figure 4. Final result of a closure by planes and direct confrontation of the cleft palate.

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technique, a microsurgical variant of IVVP, emphasizes direct visualization and precise muscle reattachment using optical aids. Furlow Z-plasty, meanwhile, allows for palatal lengthening and functional reconstruction and is also effective in selected cases [9].

Case report

We discuss the case of an 18-month-old female patient diagnosed with a partial soft cleft palate. (Figure 1) Under balanced general anesthesia and facial hygiene with a microdacyn, a Dingman-Mouth oral retractor was placed. The soft palate was visualized. Lidocaine and epinephrine were infiltrated around the periphery of the defect. An incision was made along the edge of the cleft palate, dissecting in layers until the mucosa and muscle were released.(Figure 2) These were manually approximated, and adequate coverage was observed without tension.(Figure 3) The defect was closed in layers with 3/0 Vicryl and the oral mucosa and uvula with 5/0 Vicryl.(Figure 4) Minimal bleeding was achieved with this surgical technique.

Discussion

Despite the appropriate surgical approach, complications such as palatal fistulas, dehiscences, and persistent hypernasality may occur. In cases with residual FPI, pharyngeal obturator placement, secondary pharyngoplasties, or intensive speech therapy interventions may be considered [10].
Successful treatment in these patients requires ongoing multidisciplinary care, integrating plastic surgery, otorhinolaryngology, audiology, speech therapy, and child psychology. Early intervention and long-term follow-up are key to achieving satisfactory functional and psychosocial outcomes.

Conflicts of interests

The authors have no conflicts of interests.

References

1. Sommerlad BC. A technique for cleft palate repair. Plast Reconstr Surg. 2003;112(6):1542-8.
2. Cohen SR, Kalinowski J, LaRossa D, Randall P. Cleft palate repair: a 33-year follow-up of 200 patients. Ann Plast Surg. 1991;27(6):590-6.
3. Kummer AW. Cleft palate and craniofacial anomalies: effects on speech and resonance. 4th ed. Clifton Park: Delmar Cengage Learning; 2020.
4. Peterson-Falzone SJ, Trost-Cardamone JE, Karnell MP, Hardin-Jones MA. The clinician's guide to treating cleft palate speech. 2nd ed. St. Louis: Mosby Elsevier; 2006.
5. Hardin-Jones MA, Jones DL. Speech production of preschoolers with cleft palate. Clin Linguist Phon. 2005;19(2):109-24.
6. Shprintzen RJ, Bardach J. Cleft palate speech management: a multidisciplinary approach. 2nd ed. St. Louis: Mosby; 1995.
7. Sitzman TJ, Tolliver S, Kane AA, et al. Timing of palate closure: a critical review. Cleft Palate Craniofac J. 2008;45(3):297-304.
8. Sadove AM, van Aalst JA, Culp JA. Cleft palate repair. Clin Plast Surg. 2004;31(2):231-41.
9. Furlow LT Jr. Cleft palate repair by double opposing Z-plasty. Plast Reconstr Surg. 1986;78(6):724-36.
10. Kirschner RE, LaRossa D. Cleft palate. Otolaryngol Clin North Am. 2000;33(6):1191-215.

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