

Millard Technique in The Repair of Right Unilateral Cleft Lip: Functional and Aesthetic Outcomes: Case Report

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ABSTRACT

Cleft lip is one of the most common craniofacial congenital malformations and represents a surgical challenge due to its functional, aesthetic, and psychological implications. Its origin is attributed to a disruption in the fusion of the nasomedial and maxillary processes during embryogenesis, leading to an interruption in the continuity of the upper lip, the orbicularis oris muscle, and, in some cases, the nasal base. The goal of surgical treatment is to restore normal anatomy, muscular function, and facial symmetry while achieving a natural and harmonious aesthetic outcome. This report presents the case of a three-month-old male patient with a right unilateral cleft lip, treated using the rotation-advancement technique described by Millard. The procedure was performed under general anesthesia, with anatomical reconstruction of the orbicularis oris muscle, repositioning of the cutaneous flaps, and simultaneous correction of nasal deformity. Postoperative evolution was favorable, without complications, showing proper healing and restoration of lip continuity and nasal symmetry. At six months follow-up, the results were aesthetically satisfactory, with a fine, well-pigmented scar and no retraction. The Millard technique once again demonstrated to be a safe, versatile, and effective surgical option, allowing excellent functional and aesthetic outcomes when executed with precision and respect for anatomical principles. This case emphasizes the importance of early correction of cleft lip, multidisciplinary management, and the application of refined surgical techniques to achieve a comprehensive reconstruction that restores not only anatomy but also function and confidence.

KEYWORDS: Right unilateral cleft lip; Millard technique; Lip reconstruction; Reconstructive plastic surgery; Functional outcomes; Aesthetic outcomes; Congenital malformations; Rotation-advancement; Orbicularis oris muscle; Nasal symmetry.

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INTRODUCTION

Cleft lip and palate constitute one of the most common craniofacial congenital malformations, with a global incidence estimated at 1 in 700 to 1000 live births, though frequency varies by ethnicity, sex, and geographic location. Unilateral involvement is generally more common than

bilateral, with the left side predominating over the right.^{1,2} Right unilateral cleft lip, although less frequent, represents a significant surgical challenge due to its functional, aesthetic, and psychological implications. The etiology of this malformation is multifactorial, involving both genetic and environmental factors. Risk factors include prenatal exposure

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to tobacco, alcohol, certain medications, nutritional deficiencies such as folic acid, and family history of orofacial malformations.³ The defect results from a failure in the fusion of the nasomedial and maxillary processes during embryogenesis, specifically between the fourth and seventh weeks of intrauterine development, resulting in interruption of upper lip continuity, the orbicularis oris muscle, and sometimes the nasal floor, affecting both function and facial appearance.⁴

Clinically, cleft lip represents not only an evident aesthetic alteration but also significant functional repercussions, including feeding difficulties, speech alterations, recurrent respiratory infections, dental problems, and maxillofacial growth abnormalities. Additionally, psychological and social impacts can be substantial, especially in early developmental stages, affecting self-esteem and social integration. Surgical treatment aims to restore upper lip continuity, reconstruct the muscular function of the oral sphincter, and achieve a harmonious and natural facial appearance. Over time, multiple surgical techniques have been described for unilateral cleft lip correction, including those of Le Mesurier, Tennison-Randall, and Millard, the latter being the most widely used worldwide.^{4,5}

The Millard technique, described in 1957, introduced the concept of rotation and advancement of flaps, allowing a more anatomical and functional reconstruction of the lip. Its main advantage lies in recreating the philtrum, Cupid's bow, and lip symmetry while minimizing tension on the suture line and achieving a more aesthetic scar. Although various modifications have arisen since its original description, the basic principles remain the foundation of modern surgical management of unilateral cleft lip. Postoperative outcomes depend on multiple factors, including the patient's age at surgery, defect severity, surgical precision, and postoperative

care.⁶ Optimal results involve not only aesthetic restoration but also functional recovery of the lip sphincter, adequate muscular mobility, and proper nasal alignment. Management of cleft lip patients also requires an integral, multidisciplinary approach, including plastic or maxillofacial surgeons, pediatricians, orthodontists, speech therapists, psychologists, and language therapists. This coordinated approach addresses all stages of treatment, from primary surgery in infancy to potential aesthetic or functional revisions in later stages. This report presents a case of right unilateral cleft lip treated with the Millard technique, describing the surgical technique, postoperative evolution, functional and aesthetic outcomes, and the importance of timely intervention within a comprehensive management program for cleft lip and palate patients.^{7,8}

CASE REPORT

A three-month-old male patient, first child of a healthy 25-year-old mother, presented with right unilateral cleft lip. Prenatal history was unremarkable, with no exposure to teratogenic substances or family history of congenital malformations. Birth was eutocic, with appropriate weight and height for gestational age. The initial examination revealed a clear discontinuity of the right upper lip segment, loss of Cupid's bow, and philtrum deviation toward the left. The right alar base showed mild external rotation and depression, with evident nasal floor asymmetry. Oral mucosa was partially interrupted without oronasal communication. Feeding was possible with slight difficulty, without regurgitation or recurrent respiratory infections. Preoperative laboratory tests were normal. Multidisciplinary evaluation deemed the patient suitable for primary correction using Millard's rotation-advancement technique

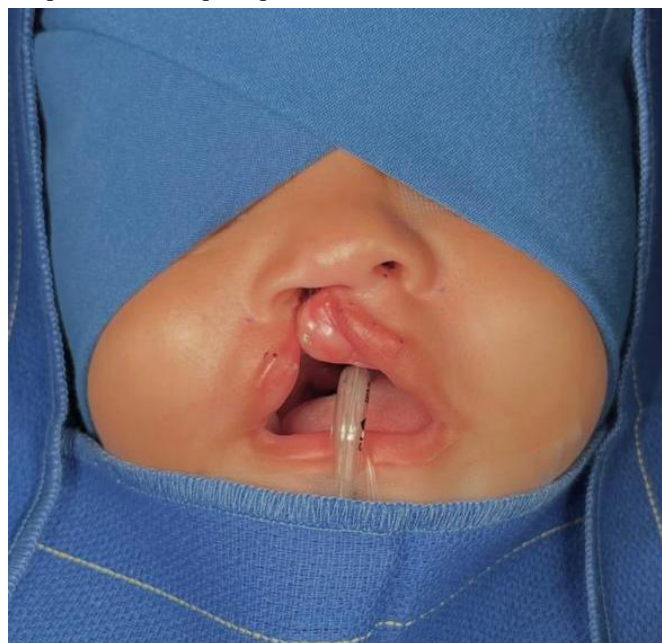


Figure 1: Preoperative image

Under general anesthesia with orotracheal intubation, the patient was placed supine with slight neck extension. Surgical markings were performed on anatomical reference points: philtrum column, Cupid's bow, nasal base, and vermilion border. Incisions characteristic of the Millard rotation-advancement technique were delineated, adapted to the right-sided defect. Local infiltration with 1% lidocaine and 1:100,000 epinephrine provided hemostasis and facilitated dissection. Incisions were performed with a No. 15 scalpel, and medial and lateral cutaneous and muscular flaps were carefully dissected. The orbicularis oris muscle, interrupted in continuity, was identified and reconstructed with 5-0 absorbable sutures, restoring oral sphincter function.

After muscular reconstruction, the medial flap was rotated and the lateral flap advanced to achieve anatomic closure, restoring Cupid's bow and philtrum. Vermilion alignment and symmetry with the contralateral side were carefully preserved. Oral mucosa was sutured with 5-0 chromic catgut,

the muscle layer with 5-0 polyglycolic acid, and the skin with 6-0 monofilament nylon using fine simple sutures to minimize tension. Internal suspension sutures corrected the right nasal base, achieving proper projection and symmetry. Antibiotic ointment and sterile dressing were applied postoperatively.

Postoperative course was uneventful, with no bleeding, hematoma, dehiscence, or infection. Analgesia with paracetamol and local care with saline irrigation and topical antibiotics were prescribed. Skin sutures were removed on day seven, showing good approximation and healing. At one month, the lip displayed symmetric alignment, thin well-pigmented scar, restored philtrum, and harmonious Cupid's bow. Lip mobility and suction function were fully recovered. Nasal symmetry remained stable without retraction or contour irregularities. At six months, functional and aesthetic outcomes were excellent, with barely perceptible scarring and natural facial integration.



Figure 2: Postoperative image

DISCUSSION

Surgical repair of unilateral cleft lip remains a major challenge in pediatric plastic and reconstructive surgery, requiring simultaneous restoration of function, facial symmetry, and lip aesthetics. In this case, Millard's rotation-advancement technique yielded satisfactory functional and aesthetic results, consistent with international literature where it is considered the method of choice. Since its introduction in 1957, Millard's technique revolutionized cleft lip repair by rotating the medial flap and advancing the lateral flap, recreating the anatomical structures of the upper lip with a natural appearance.^{9,10} Unlike earlier techniques such as Tennison-Randall, which use triangular flaps or rigid geometric incisions, Millard's method follows natural lip

lines to achieve less perceptible scars and a harmonious philtrum and Cupid's bow. Successful outcomes depend on meticulous surgical planning and understanding of lip and nasal anatomy. Reconstructing the orbicularis oris muscle is critical for restoring oral sphincter competence and proper lip mobility during feeding and facial expression. Nasal correction, performed concurrently, enhances symmetry and stability, reducing the need for secondary procedures.¹¹ Early intervention, ideally between three and six months, optimizes tissue handling, healing, and adaptation to facial growth while minimizing psychosocial impact. Postoperative results in this case align with international standards, showing a thin, linear, well-pigmented scar, restored philtrum, defined Cupid's bow, and stable nasal symmetry. No complications

occurred, highlighting the importance of surgical precision, flap vascular preservation, and minimal suture tension. Although modifications to Millard's original technique have been proposed, the core principles of design flexibility and patient-specific adaptation remain its greatest strength.^{12,13}

CONCLUSION

The experience from this case also highlights the importance of performing surgical intervention at an early age, ideally between three and six months. Early surgery facilitates tissue handling, optimal healing, and adaptation to subsequent facial growth, while minimizing the psychological impact on both the patient and the family. Timely treatment improves feeding and speech function and contributes significantly to the emotional and social development of the child, essential factors for overall integration and well-being.¹⁴

It is also important to emphasize that correction of the nasal component during the same procedure is an essential part of treatment, as alar deformity is inherent to unilateral cleft lip. Early remodeling of the nasal base and repositioning of the soft tissues of the affected ala help achieve greater long-term symmetry and aesthetic stability. In this case, proper nasal reconstruction contributed significantly to overall facial balance and prevented the need for secondary procedures.¹⁴

The results observed underscore the importance of a multidisciplinary approach in the comprehensive management of cleft lip and palate patients. Coordinated participation of plastic surgeons, pediatricians, anesthesiologists, orthodontists, speech therapists, and psychologists allows simultaneous management of medical, functional, aesthetic, and psychosocial aspects, ensuring comprehensive treatment and rehabilitation. Surgery alone does not mark the end of treatment but rather initiates a continuous follow-up process focused on facial growth, speech function, and emotional development.¹⁵

The outcome of this clinical case confirms that the Millard technique, when applied correctly and adapted to the anatomical particularities of each patient, provides stable, reproducible, and high-quality aesthetic results. Its flexible design and ability to be individualized make it an invaluable tool in the reconstructive surgical arsenal. Moreover, the low incidence of complications and quality of scarring support its continued use as the gold standard in unilateral cleft lip repair.¹⁵

In conclusion, the Millard technique represents an ideal fusion of surgical art and science. Its application requires aesthetic sensitivity, technical mastery, and a profound understanding of facial anatomy. The case presented demonstrates that through careful execution and comprehensive care, it is possible to achieve outstanding functional and aesthetic results, restoring not only the anatomy of the lip but also the confidence, identity, and quality of life of the patient. Interventions of this kind highlight the significance of reconstructive surgery as a

discipline that restores not only form but also function and human dignity.

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