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Case Report

The Tessier No. 7 Cleft Dilemma: A Case Report of Macrostomia and Its Reconstruction

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A B S T R A C T

Transverse facial clefts type 7 (also known as congenital macrostomia) are rare congenital malformations resulting from a defect in mesodermal migration and fusion between the maxillary and mandibular processes. Clinical manifestations range from a slight notch at the corner of the mouth to severe disfigurement, often overlapping with the spectrum of hemifacial microsomia or Goldenhar syndrome. The therapeutic goal is to achieve a symmetrical and functional corner of the mouth with minimal scarring. In this article, we report a new case of congenital macrostomia treated in the maxillofacial surgery department of the 20 August 1953 Hospital in Casablanca.

Keywords: Transverse cleft; Macrostomia; Congenital cleft; Oral commissure; Tessier No. 7 cleft; Vermillion square flap; Z-plasty; W-plasty; First branchial arch

Introduction

Congenital macrostomia is a rare congenital malformation with an estimated incidence of between 1 in 60,000 and 1 in 300,000 live births. It is more common in males and typically affects the right side, although bilateral forms do exist.

The mechanism dates back to embryonic development and involves a failure of fusion-or disrupted mesenchymal migration-between the maxillary and mandibular processes of the first branchial arch.

Several clinical presentations are possible, ranging from an isolated anomaly to a broader clinical syndrome, most commonly hemifacial microsomia or Treacher-Collins syndrome.

Beyond the obvious aesthetic imbalance, macrostomia causes significant functional impairments, including difficulty eating, excessive salivation and problems articulating certain syllables. Treatment is surgical and involves functional repair of the orbicularis oris muscle, precise and symmetrical positioning of the neocommissure and optimal selection of the skin closure technique to achieve a satisfactory dynamic and functional outcome.

Case Report

A 6-year-old boy, an only child, born following a well-managed pregnancy with no complications or incidents during delivery and no history of intensive care or prior hospitalization.

The mother has no history of substance abuse (tobacco or alcohol) or exposure to secondhand smoke during pregnancy.

No fenugreek was consumed during pregnancy.

No parental consanguinity was noted.

The family history did not include any similar cases, facial clefts or other congenital anomalies.

Clinically, facial asymmetry is noted, consisting of an asymmetric bilateral macrostomia, characterized by a lack of fusion between the lips at the commissures. This cleft was significantly more pronounced on the left side than on the right.

Clinical examination of the other systems revealed no other associated malformations, suggesting a diagnosis of isolated bilateral macrostomia.

Functionally, this deformity resulted in noticeable speech articulation difficulties (specific to certain letters) and feeding issues due to the lack of oral sphincter competence. In addition to these functional impairments, the patient exhibited significant facial asymmetry both at rest and during animation, causing substantial aesthetic concern **(Figure 1)**.

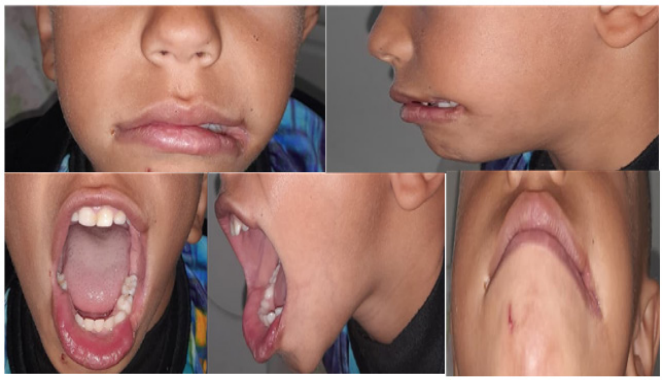

Figure 1: Frontal and profile images of the child with the mouth open and closed, showing bilateral congenital macrostomia.

Surgical management

The procedure was performed under general anaesthesia with midline oral endotracheal intubation.

The first step involved mapping and precisely marking the location of the planned bilateral neocommissure. Given the asymmetrical nature of the cleft, the reference point for the new oral commissure was determined by drawing a vertical line starting from the medial limbus (or passing through the pupil during a straight-ahead gaze into infinity / midgaze) to intersect the mucocutaneous junction. This positioning was reconfirmed by identifying the transition zone where the muscle bundles terminated and where the vermilion began to taper. Anthropometric measurements were taken to ensure optimal lip symmetry between the two sides.

After local infiltration with an anesthetic solution containing epinephrine at a 1:200,000 ratio for hemostasis, incisions were made, followed by subcutaneous and submucosal dissection to isolate and expose the superior and inferior bundles of the orbicularis oris muscle.

The excess oral mucosa was excised and closed linearly up to the neocommissure.

Reconstruction of the oral sphincter involved superimposing the muscle bundles of the orbicularis muscle: the upper bundle was positioned anteriorly (above) the lower bundle and secured using horizontal mattress sutures with absorbable suture material, which successfully reconstructed the muscular modiolus. A vermilion flap was transposed to cover the new buccal angle, thereby avoiding a direct suture line at the commissure.

At the skin level, a bilateral Z-plasty was designed and performed to break the longitudinal axis of the scar **(Figure 2)**.

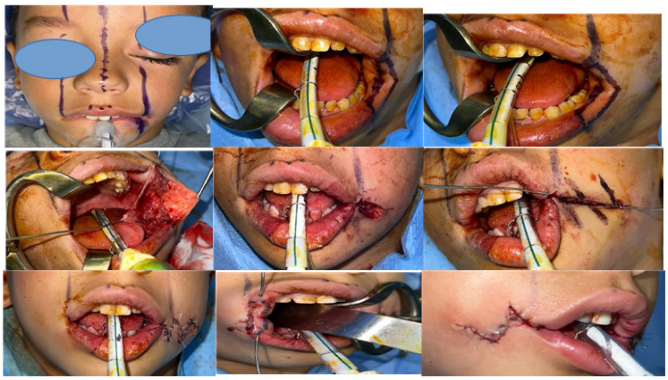

Figure 2: Illustrations showing the surgical steps involved in reconstructing the new commissures, as well as the final result following a Z-plasty of the skin.

Postoperative course and follow-up

The immediate postoperative period proceeded without incident and no early complications were observed. At the 3-month follow-up evaluation, highly satisfactory results were observed in terms of both function and aesthetics:

- **Functional restoration:** complete closure of the buccal sphincter was successfully achieved, with optimal oral seal during feeding and a total elimination of food and liquid leakage.
- Furthermore, speech articulation showed remarkable improvement, effectively correcting preoperative phonetic deficits.
- **Aesthetic outcome:** the reconstructed lips achieved excellent structural symmetry, both at rest and during dynamic facial movements. The newly positioned neocomissures retained a natural contour with well-balanced vermilion thickness. Furthermore, the bilateral Z-plasty resulted in discreet scars, completely free of contractile bands that could restrict normal mouth opening **(Figure 3)**.

Discussion

Congenital macrostomia or transverse facial cleft, corresponds to cleft no. 7 in Tessier's craniofacial classification. It represents the most lateral variant of facial clefting, resulting from a failure of fusion between the maxillary and mandibular processes of the first branchial arch during early embryonic development[1,2]. Recently, Woods et al. proposed a detailed subclassification to better standardize the clinical approach to

this deformity[3]. With an estimated incidence ranging from 1 in 60,000 to 1 in 300,000 live births[4,5], macrostomia remains a rare clinical entity. The literature classically reports a higher prevalence in males and a predominance of unilateral rightsided involvement[1,4]. The uniqueness of our case lies in its bilateral and asymmetrical presentation (significantly more pronounced on the left side) occurring as an isolated anomaly, in the absolute absence of syndromic features or maternal prenatal risk factors (such as consanguinity, tobacco or alcohol exposure). While Tessier cleft no. 7 can present as an isolated finding, it is frequently embedded within broader oculo-auriculo-vertebral or phenotypic spectrums, such as hemifacial microsomia, Treacher-Collins syndrome, Goldenhar syndrome or simply associated with isolated pre-auricular tags[2,5,6].

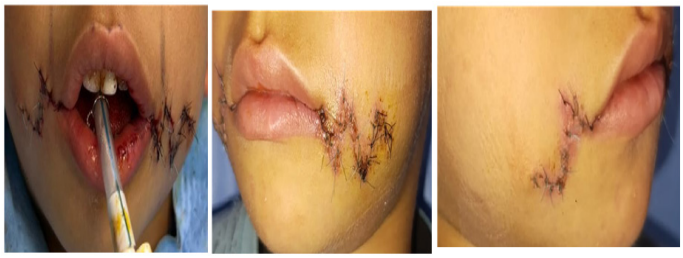

Figure 3: Showing the final scar at day 0 and day 7 post-surgery.

Beyond the obvious aesthetic disharmony both at rest and during facial animation, macrostomia disrupts the structural continuity of the oral sphincter, severely impairing local function. The rupture of the orbicularis oris muscle muscular band prevents normal labial competence. This anatomical deficit accounts for the feeding difficulties oral fluid incompetence and speech articulation deficits (specifically affecting certain consonants) observed in our 6-year-old patient[4,5]. Correcting these comprehensive deficits relies entirely on a precise and early surgical intervention, although the optimal technical modalities remain a subject of ongoing discussion[4,7].

The primary challenge in reconstructing bilateral forms of macrostomia is the accurate localization of the planned neocommissure (the cheilion). In unilateral cases, the unaffected contralateral side serves as an ideal anthropometric reference to guide measurements (such as the crista philtri to cheilion distance)[2,5]. Conversely, bilateral cases-particularly when asymmetrical-preclude the use of a healthy counterpart and necessitate strict geometric landmarks to guarantee postoperative symmetry, as emphasized by Rogers and Mulliken in their long-term anthropometric evaluations[8]. In alignment with the landmarking methods historically established by Onizuka[9] and widely adopted in modern pediatric plastic surgery[5], the positioning of the new oral commissure was determined by dropping a perpendicular line from the medial limbus (or midgaze) to intersect the mucocutaneous junction. This point precisely marks the transitional zone where the normal vermilion begins to thin and the white roll tapers.

The second critical challenge, which directly dictates the functional prognosis, is the muscular reconstruction. A simple edge-to-edge approximation of the orbicularis oris muscle bundles exposes the patient to an elevated risk of dehiscence, muscular dyskinesia or a secondary morphologic deformity classically described by Boo-Chai as a "gold-fish mouth appearance[10]". To restore a competent, dynamic sphincter, surgical techniques have shifted toward overlapping myoplasties or refined reconstructions of the muscular modiolus[4]. Adhering to the core principles established by Kaplan[11], we performed a meticulous subdermal dissection and a clear-cut repositioning of the upper and lower muscle bundles, overlapping them to reconstruct a functional muscular modiolus. This specific modification explains the total resolution of the preoperative speech deficits and oral incontinence at the 12-month follow-up, corroborating the excellent bilateral outcomes reported by Ibrahim, et al.[12]. Furthermore, to optimize the mucosal transition at the newly created oral angle, a vermilion square flap was executed-a method popularized by Eguchi, et al.[13] and Dhingra, et al.[14]. Transposing this flap avoids a straight suture line directly over the neocommissure, thereby preventing secondary notches, webbed contractures or mucosal deficits[4,13].

Finally, the selection of the cutaneous design for cheek cleft closure remains a heavily debated topic. Although simple straight-line closure defended by authors such as Schwarz and Sharma[15] or Yoshimura, et al.[16], offers technical simplicity, it carries a high long-term risk of linear scar contracture. Such contractures form a rigid band that restricts maximal mouth opening and distorts the commissure during facial animation[2,4]. To circumvent this pitfall, local tissue rearrangements, such as W-plasty or Z-plasty, are highly preferred[4,5]. In our patient, a bilateral Z-plasty was selected. As demonstrated in recent literature, notably the case series by Ali Sundoro, et al., combining a vermilion square flap with a Z-plasty skin closure significantly enhances both aesthetic and functional outcomes[7]. Furthermore, as highlighted by Yu, et al. regarding the significance of Z-plasty limb directions, this geometric repair not only breaks up the longitudinal contractile axis of the scar but also redirects the vectors of tension along Kraissl's natural facial lines and the nasolabial fold[17,18]. This can also be performed via a double Z-plasty technique to redistribute tension further[19]. At the 12-month postoperative evaluation, this approach yielded a highly satisfactory cosmetic and functional result. The scars remained soft, flat and perfectly integrated into the dynamic expressions of the child's face, with a completely unhindered interincisal opening **(Figure 4)**.

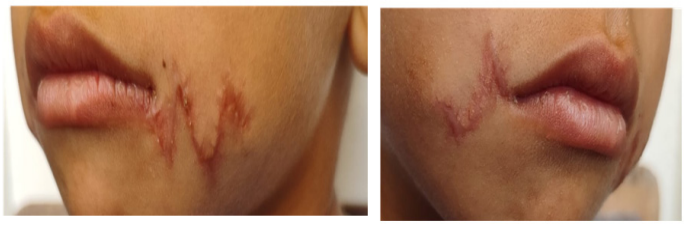

Figure 4: Iconography of the patient 45 days after surgical reconstruction. The patient is currently undergoing laser resurfacing treatments

Conclusion

In conclusion, isolated bilateral macrostomia is a rare variant of Tessier cleft no. 7. Its management, reported here in accordance with current surgical consensus guidelines[20], must satisfy three strict requirements: accurate geometric landmarking to secure facial symmetry, a three-dimensional overlapping myoplasty to re-establish oral sphincter competence and a meticulously oriented cutaneous Z-plasty to prevent contractile scar complications and optimize long-term aesthetic harmony.

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