

Algorithm for Aesthetic Reconstruction of the Bifid Nose in Tessier Number 0 Cleft

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ABSTRACT

Nasal deformities associated with Tessier no. 0 cleft are complex deformities and their reconstruction represents a challenging problem. The result should be aesthetically pleasant to allow for the patient to be involved in the community with confidence. In this paper we present a retrospective review a small series of Tessier no. 0 cleft with bifid nose undergone nasal reconstruction. Operative details and results are presented.

INTRODUCTION

Craniofacial clefts are rare. The exact incidence is not known, but estimates range from 1.4 to 4.9 per 100,000 live births [6]. Nasal deformity associated with Tessier no. 0 cleft is unique and causes severe disfigurement for the patient. The reconstruction of these deformities represents a great challenge.

There is a paucity of articles related to this unusual malformation, and those that exist are confined to clinical examination and surgical treatment of a small number of patients [1-3]. So, there is no fixed protocol for surgical management.

The no. 0 cleft is the most common of craniofacial clefts and can be present either as a widening or duplication of the midline structures, or as agenesis/hypoplasia of these structures. True median cleft lip begins as a median cleft upper lip, with a duplicated labial frenulum. The nose is often bifid, with a broad columella and a wide midline furrow. The nasal septum is thickened and often duplicated. A wide diastema of the upper central incisor teeth may be present. The nostrils may be asymmetric. The alar and upper nasal cartilages are hypoplastic and often displaced laterally. A thick subcutaneous fibromuscular band from the alar cartilages to the frontal bone can pull the columella upward and make the nose appear shorter [8]. Other structures formed by the frontonasal process include the forehead, glabella, interorbital

area, and prolabium and may explain the association with midline cleft lip and hypertelorism [10].

In this paper we present a small series of Tessier no. 0 cleft with bifid nose and the surgical procedures used for nasal reconstruction.

MATERIAL AND METHODS

In the period between January 2004 and December 2010, a review of Tessier no. 0 cases with bifid nasal deformities was done. The review included the clinical presentation, surgical management of the nasal deformities and the follow-up of the cases (Table 1).

RESULTS

A total of 5 patients were included in the study (Table 1). All patients had a minimum follow-up of 5 months. There were 2 females and 3 males. All of the cases had their cleft lips previously treated in other centers. In one case (case no. 3) a previous trial of correcting the nasal deformity was done in other center.

Case presentations:

Case no. 2 (Fig. 1):

18 year old male presented with Tessier facial cleft no 0 with bifid nose. The patient had a previous surgery to repair the cleft lip. Open external approach rhinoplasty was used with inverted V columellar incision to aid in columellar elongation upon closure. Wedge piece of bone were excised from the duplicated lower part of the bone septum. Multiple polypropylene interdomal and transdomal sutures were done. Two layers onlay tip conchal cartilage graft added to the tip area for more tip definition. Closure of the incision was done with an inverted V-Y pattern for columellar elongation.

Case no. 3 (Fig. 2):

22 year old female presented with Tessier facial cleft no. 0 with repaired bifid nose and mild degree of hypertelorism. There was a midline alveolar notch. The dorsum of the nose was low and the tip was still bifid and depressed. The bony nasal septum was broad in its lower part with absence of the cartilaginous septum. The patient had 2 previous surgeries was done in other center but the patient were not satisfied with the result and complaining of abnormally looking nose. Open external approach rhinoplasty was used with inverted V columellar incision to aid in columellar elongation upon closure. After dissection, polypropylene su-

tures of previous interdomal sutures were found in the tip area. Wedge piece of bone were excised from the duplicated lower part of the bone septum. The two lower lateral cartilages were deficient to reconstruct a good dome. Costo-chondral cantilever graft was harvested from the 5th rib and other cartilage piece for the columellar strut. The upper part of the cantilever graft was fixed with external bolster suture. The caudal end of the columellar strut was fixed to the area of anterior nasal spine. The cantilever osseocartilagenous graft and the columellar cartilage grafts were sutured together. Closure of the incision was done with an inverted V-Y pattern for columellar elongation.



(A)



(B)



(C)



(D)

Fig. (1): Case no. 2: Preoperative (A, C) and 6 month postoperative photographs (B, D), frontal (A, B) and basal (C, D) views.

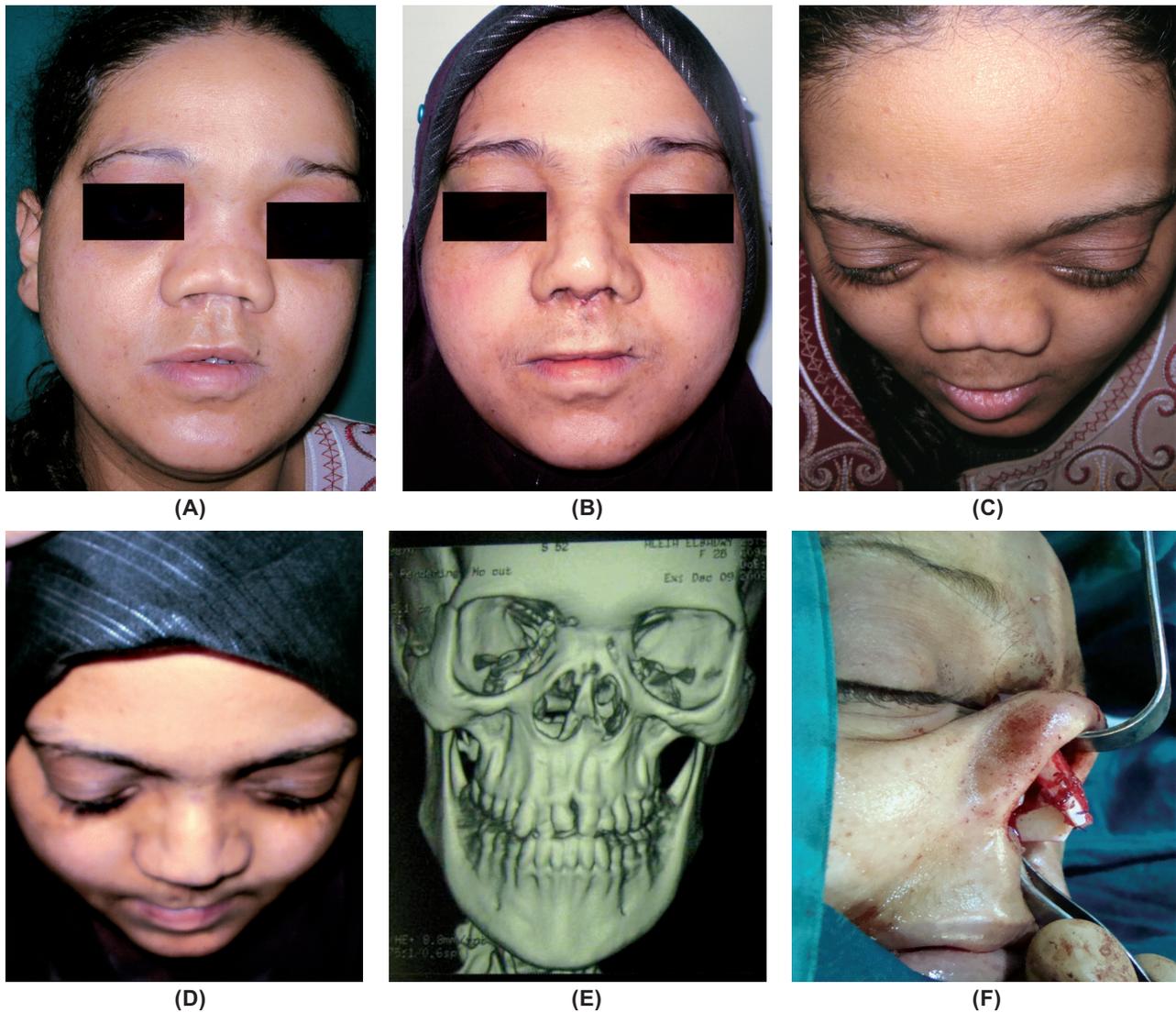


Fig. (2): Case no. 3: Preoperative (A, C) and 6 month postoperative photographs (B, D) of case no. 3, frontal view (A, B) and from above (C, D), 3D CT image of the case (E), and intraoperative photography of the cantilever graft and the columellar strut graft (F).

Table (1): Clinical presentations of the cases and their surgical management of the nasal deformity.

Case No.	Age	Sex	Previous treatment	Associated findings	Nasal correction
1	5y	M	Yes (lip repair)	Cleft lip and palate and mental retardation	Domal sutures
2	18y	M	Yes (lip repair)	Cleft lip, alveolus (notch)	Domal sutures, tip cartilage draft
3	22y	F	Yes (lip and nose repair)	Cleft lip, alveolus (notch) and hypertelorism	Cantilever graft, columellar strut
4	16y	M	Yes (lip repair)	Cleft lip, alveolus, Tessier 9 cleft	Domal sutures
5	10y	F	Yes (lip repair)	Cleft lip	Domal sutures

DISCUSSION

Nasal reconstruction in facial cleft represents a great challenge. The result should be aesthetically pleasant to help the patient to be integrated into the community with confidence. In this paper we present a small series of nasal deformities in cases with cleft 0 with tissue deficiency.

The presentation of the five cases of bifid nose with Tessier no. 0 clefts varies from just separation of the lower lateral cartilages to marked separation and hypoplasia of the cartilage with loss of the dorsal nasal height.

We found cases which were being able to be corrected by just domal modification sutures with

the available lower lateral cartilage present. In other cases after doing the previous step, the tip height was still insufficient. Tip cartilage onlay grafts were needed for the appropriate result. It was found that alar cartilage could be hypoplastic in Tiesser 0 noses [8]. When the cartilage is severely deficient, new tissue should be added as the available tissue will not be enough to get good result. This was evident with case 3 and the previous unsuccessful trial to repair the bifid nose with the available tissue by suturing together the separated parts in the midline and domal sutures. This case needed bringing new tissue to complete the reconstruction taking into consideration that also there is loss of dorsal height. There is controversial which better autologous material to be used for augmentation. Bone grafts are subject to remodeling and they get slimmer and less irregular by time, but they are also at risk for resorption [11]. Cartilage grafts are easier to be carved and have less ability to resorb but have a tendency for warping, which will alter the configuration of the cartilage graft over time. Also because cartilage does not undergo remodeling, graft irregularities may be visualized through the skin over time [5].

Millard was one of the first who supported the cantilever concept. He rigidly fixed a bone graft at the glabella [7]. David and Moore was the first to use the osseocartilagenous part of the rib as a cantilever graft. The advantage is that the lower part is cartilaginous to avoid excessive tip rigidity [4].

We think that osseocartilagenous rib graft is the best material to be used for dorsum and tip reconstruction in cases with bifid nose where local tissues are deficient for reconstruction. Based on the principle of reconstruction "like with a like tissue". The upper nose is reconstructed by bone, and lower part and the tip with cartilage to give the natural consistency and avoids excessive rigidity if bone will be used.

We didn't rigidly fix the upper bony part of the graft to the nasal bone. We preferred a tight subperiosteal tunnel for the graft and a cutaneous bolster suture around the graft to add to the fixation. It was found that when a cantilever graft is used

with a tight subperiosteal pocket over the nasal bones, the grafted bone remains well approximated to the nasal bones and additional fixation was not necessary [9]. We also added percutaneous fixation suture to further fix the graft into position.

In conclusion, bifid nose with Tiesser 0 cleft can be presented by variable degree of tissue deficiency. Sometimes there is no or minimal tissue deficiency and bringing the lower lateral cartilages together by sutures (interdomal and transdomal sutures) is enough. When more tissues are deficient, additional height can be achieved by adding layers of onlay conchal cartilage tip graft. In more advanced tissue deficiency with loss of the dorsal height, a cantilever graft with columellar strut is needed to achieve the desired outcome.

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