Research Article

Pre-maxillary Turn Over Palatal Flap For Bilateral Cleft Palate Repair

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Abstract |

Background: Palatal fistula is the most common complication following cleft palate repair with a reported incidence of 4% to 58%. Ample reconstructive options are described in literature and are in practice. We demonstrate incorporation of Pre-maxillary turn over palatal flap in bilateral cleft palate repair which will aid in reducing rate of anterior palatal fistulas.

Methodology: This was a prospective study conducted at Liaqat National Hospital over a 2-year period (Jan 2019 – Dec 2020). 13 patients planned to undergo bilateral cleft palate repair were included in the study. In all these patients a premaxillary mucoperiosteal turn-over flap was incorporated into the nasal lining. Patients were followed up for 2 years. Early (dehiscence, flap necrosis and fistula formation), and late complications (VPI) were assessed and recorded.

Results: The mean age at the time of intervention was 7.61 months. Eight were males (61%) and 5 were females (38%). There was a partial wound dehiscence of oral lining in one patient, which was most likely secondary to poor oral hygiene as parents were non-compliant to the instructions given. There was no incidence of flap necrosis or fistula formation. None of the patients had VPI at 2 years follow-up.

Conclusion: Incorporation of Pre-maxillary turn over palatal flap for selected bilateral cleft palate repair reduces anterior fistula formation, which is often difficult to close causing hindrance in alveolar cleft closure.

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Keywords | Cleft palate, Bardach's two flap technique, pre-maxillary turn over flap, palatal fistula, muco-periosteal flap

Introduction

Cleft palate is among the common congenital defects of the palatewhich causes oral and nasal deformity. It has a reported incidence of 1 in 500 to 1000 live births, predominantly affecting males, and with variation among different regions and ethnic groups.[1,2] It causes difficulty with feeding and speech, and is considered a social stigma. Cleft palate can occur either in isolation or in association with congenital syndromes.[3,4,5,6] There are various types of cleft palate seen in routine practice. Numerous procedures are described for palate repair in literature with a number of modifications published by elite plastic surgeons throughout the world. Complications after cleft palateinclude wound dehiscence, flap necrosis, and fistula formation in early period and velo-pharyngeal insufficiency later. Palatal fistula is the most common complication following cleft palate repair with a reported incidence of 4% to 58%,[7] and can occur either in hard or soft palate. Those occurring between the alveolar arch and incisive foramen are called anterior palatal fistula.[8,9] Deficient nasal lining in this region contributes to the formation of anterior palatal fistulae. We incorporated pre-maxillary palatal turn over flap in bilateral cleft palate repair to augment the nasal lining of this region to decrease the risk of anterior palatal fistulae.

Methodology

The prospective study was conducted over a period of 2 years (January 2019 to December 2020) at the department of plastic and reconstructive surgery, Liaquat

national hospital, Karachi, Pakistan. Inclusion criteria were age ⩾ 6 months and ⩽ 12 months, and weight ⩾ 8 Kg. Under standard surgical protocol, they underwent bilateral cleft palate repair (primary repair). Pre-maxillary turn over palatal flap was integrated during bilateral cleft palate repair using Bardach's two-flap technique.[11] All received standard post-operative care. Parents were given clear instructions at the time of discharge so as to reduce the chances of patient related factors leading to failure of surgery/complications. Patients were followed post-operatively on weekly basis for 6 weeks and then fortnightly, with a total follow up of 3 months to assess early complications (e.g wound dehiscence, flap necrosis, and fistula formation) and further followed for 3 years for late complications like velo-pharyngeal insufficiency. Pre lingual speech evaluation was done at 2 years and formal speech evaluation done at 3 years of age. All details were collected on a proforma and relevant pictures were taken after taking written informed consent from parents, keeping patient identity and details confidential.

Surgical Technique:

Oral intubation was done by a senior experienced anesthetist. Under standard aseptic measures, Bardach's two-flap technique was followed for palate repair. Along with it a small rectangular full thickness muco-periosteal flap was raised from the palatal pre-maxilla which was turned over to 180 degrees and incorporated in the nasal layer of the bilateral cleft repair. Palatal mucosal flaps are advanced as described by Bardach's and sutured to raw pre-maxilla (Figures 1 and 2).

Figure-1: *Demonstrating steps of pre-maxillary turnover flap for bilateral cleft palate repair. a) Basic anatomy of cleft palate, b) incisions marked, c) Flaps mobilized and dissection done to separate nasal and oral layers, d) closure of the nasal layer with incorporation of pre-maxillary turnover flap, e) final closure.*

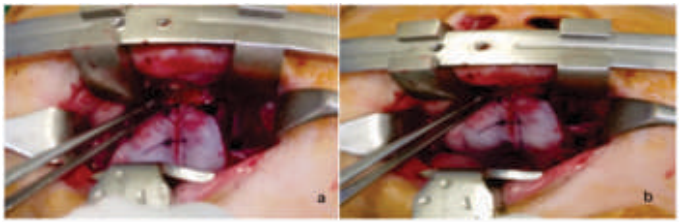

Figure 2- *Demonstrating pre-maxillary turnover flap for bilateral cleft palate repair*

Results

The mean age at the time of intervention was 7.61 months. Eight were males (61%) and 5 were females (38%) (Table 1). All patients were followed for 6 weeks on weekly bases during which complete wound healing was observed in all patients except one who developed partial wound dehiscence which eventually healed conservatively. There was no evidence of fistula formation during the study period. None of the patients went on to develop VPI in this study. (Table 2)

Table 1: *Patient demographics*

Age	**7.61(±0.8) months**
Gender	
Males	8 (61%)
Females	5 (38%)
Weight	11.5 (±0.9) Kg
Ethnicity	Asians (Indian Asian)

Table 2: *Complications after complete cleft palate repair*

	Wound dehiscence	**Complete**	**0**
		Partial	1
Early	Fistula formation		0
	Flap necrosis		0
	Breathing Difficulty		0
Late	VPD		0

Discussion

Fistula formation after cleft palate repair is one of the common complications encountered by plastic surgeons. Although basic principles of a two layered closureis followed universally, the incidence of palatal fistula ranges between 4 to 58%.[7] Pittsburgh et al., described a classification system for palatal fistula.[11] Complications after fistula formation include nasal regurgitation, nasal emission, tooth caries, poor oral hygiene, fetor oris and hyper nasal speech. Meticulous dissection of the flaps with preservation of the blood supply and tension free closure of both the nasal and oral layers of the cleft palate repair reduces the chance of palatal fistula formation and related complications. A number of techniques have been described in literature for the treatment of palatal fistula.[12-16] These include local myo-mucosal flap, vomer flap, inferior turbinate flapamdFAMM flap. All of these can be utilized for both oral and nasal lining defects. Among the above mentioned, vomer flap, inferior turbinate flap and buccal pad fat are well known to be utilized in primary repair of bilateral cleft palate.[17,18,19,20]

Our study demonstrated, the successful incorporation of pre-maxillary palatal turn-over flap in primary bila-

teral cleft palate repair, and reduction in the incidence of palatal fistula. It is particularly useful in closure of wide cleft palate. Our results demonstrated that such a modification in primary bilateral cleft palate repair is worth mentioning.

Conclusion

Our study demonstrated overall good results of bilateral cleft palate repair with pre-maxilla palatal turnover flap, allowing tension free closure of nasal layer and reducing the risk of fistula formation.

Conflict of interest *None*

Funding Source *None*

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