

for 2 more weeks. Evaluation of the viability of the flap was done regularly and after 3 weeks the base of the flap was separated (Figs 1–4).

Results

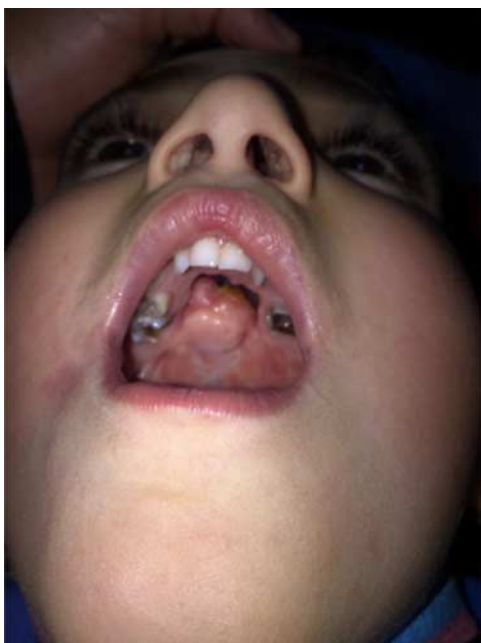
This study included 10 patients who underwent closure of anterior palatal fistula. Our study included seven men and three women with their ranging age from 15 till 72 months with a mean age 35.5 months. Five patients had tripartite cleft palate, three patients had bipartite cleft palate, and only two patients had complete intermaxillary cleft palate. Eight (80%) patients underwent multiple surgeries before their presentation to us and only two (20%) patients underwent one previous surgery. The size of the fistula was less than 1 cm in six (60%) patients and more than 1 cm in four (40%) patients. The palate in 10 (100%) patients was found to be scarred. Harvesting of the flap was done for 10 patients with its length being 3 cm in seven patients, 2.5 in two patients, and 4 cm in one patient and its width was 1.5 cm in eight patients, 2 cm in one patient, and 1 cm in another patient. Upper lip myomucosal flap was used as an additional layer repair in seven (70%) patients and as the only layer for the repair in three (30%) patients. Viability of the flap was evaluated in the first day, third day, first week, and second week postoperatively and was found that seven (70%) patients had viable flaps and only three (30%) patients had nonviable flaps. Success of the repair was evaluated on the first and third months postoperatively and was found successful in seven (70%) patients and had failed in three (30%) patients.

Discussion

Closure of the anterior palatal fistula is a challenging problem specially in recurrent cases [2]. Multiple techniques

were advocated to repair this type of fistula with variable degrees of success [1]. Upper lip myomucosal flap is used in this study to try to repair this type of fistula. In this study, we did surgery for 10 patients, seven male infants and three female infants with their ages ranging from 15 to 72 months with a mean age of 35.5 months. Relatively old age of the patients is related to multiple surgeries for repair of the primary cleft and trials for repair of its complications. In this study five (50%) patients had tripartite cleft palate, three (30%) patients had bipartite cleft palate, and only two (20%) patients had complete intermaxillary cleft palate, which indicate the increased incidence of the fistula with increase in difficulty of primary palatal defect. This is comparable

Fig. 1



Preoperative anterior oronasal fistula.

Fig. 2



Harvesting of the flap.

Fig. 3



Immediate postoperative photograph of the patient.

Fig. 4



Three weeks postoperative photograph of the patient.

with the work of Zhang *et al.* [3], who reported the same results. Previous multiple surgeries were found in eight (80%) patients and only two (20%) patients did one surgery before. This was matching with the finding that all patients (100%) had a palatal scar, even the two cases that had only one surgery also had an evident palatal scar. This was reported by Bonanthaya *et al.* [1], who found a relation between incidence of recurrent fistula with increased palatal scar. The size of the fistula was less than 1 cm in six (60%) patients and more than 1 cm in four (40%) patients. The size of the fistula causes difficulty in the repair and finally affects the result [4]. With harvesting of the flap, we tried to stick to the rule 2 : 1 in relation to the length and width of flap to maintain its vascularity [5]. We tried to use this flap as an additional layer in seven (70%) patients and was unable to do this in three (30%) patients and we used it as a single-layer closure. Viability of the flap was evaluated in the first day, third day, first week, and second week postoperatively and it was viable in seven (70%) patients and nonviable in three (30%) patients. The three failed patients were found to be the oldest in age and were having the largest defect with previous multiple surgeries. This is match with the work of Sitzman *et al.* [6], Ogata *et al.* [7] and

Galicia *et al.* [8], who reported that the incidence of success of the repair decreases with increase in trials of previous palatal repair. The success rate was found after first and third months to be 70%.

Conclusion

Upper lip myomucosal flap is an option for the management of anterior oronasal fistula. It gives the best results in cases with fistulas of less than 1 cm in width and if it used as an additional layer in repair. In cases with fistulas of more than 1 cm in width or cases with severe tissue scarring not allowing primary closure before use of this flap, the results are not satisfactory and needs more evaluation. So, we conclude that this technique is feasible; however, its efficacy should be tested in a larger number of patients to be considered as an option for the treatment of anterior oronasal fistula.

Conflicts of interest

There are no conflicts of interest.

References

- 1 Bonanthaya K, Shetty P, Sharma A, Ahlawat J, Passi D, Singh M. Treatment modalities for surgical management of anterior palatal fistula: comparison of various techniques, their outcomes, and the factors governing treatment plan: a retrospective study. *Natl J Maxillofac Surg* 2016; **7**:148–152.
- 2 Hassan O, Shoukry T, Raouf AA, Wahba H. Combined palatal and buccal flaps in oroantral fistula repair. *Egypt J Ear Nose Throat Allied Sci* 2012; **13**:77–81.
- 3 Zhang Z, Stein M, Mercer N, Malic C. Post-operative outcomes after cleft palate repair in syndromic and non-syndromic children: a systematic review protocol. *Syst Rev* 2017; **6**:52.
- 4 Shankar VA, Snyder-Warwick A, Skolnick GB, Woo AS, Patel KB. Incidence of palatal fistula at time of secondary alveolar cleft reconstruction cleft palate. *Craniofac J* 2017; **31**:32.
- 5 Mohan V, Nair RU, Usha AM. Versatility of tongue flaps for closure of palatal defects – case report. *J Clin Diagn Res* 2017; **11**:31–33.
- 6 Sitzman TJ, Allori AC, Matic DB, Beals SP, Fisher DM, Samson TD, *et al.* Reliability of oronasal fistula classification. *Cleft Palate Craniofac J* 2016; **29**:16186.
- 7 Ogata H, Sakamoto Y, Kishi K. Cleft palate repair without lateral relaxing incision. *Plast Reconstr Surg Glob Open* 2017; **5**:3.
- 8 Galicia Partida AI, Lugo RR. Reconstruction of anterior palatal fistula with anterior-based lingual flap. Case report. *Revista Odontológica Mexicana* 2016; **20**:50–56.