Reconstruction of anterior palatal defects with orbicularis oris myomucosal transposition flap: a retrospective study

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Background
Palatal defects are commonly encountered complication with cleft palate surgery. The anatomical location of the fistula can vary significantly but commonly occurs in the hard palate or at the junction with soft palate. Treatment is tailored according to site, size, and clinical presentation. A wide range of surgical options have been tried. This study aimed to discuss the outcome of proposed bilayered reconstruction with medially based pedicled orbicularis oris myomucosal flap.
Patients and methods
A total of 16 consecutive patients were presented with isolated secondary anterior oronasal fistula of ~6.6±2 mm size, classified as Pittsburgh type V – primary palate at incisive foramen or junction of primary and secondary palate. Overall, 11 (68%) were bilateral and treated for primary closure by Von Langenbeck technique, whereas five patients were unilateral incomplete and were also have the same primary treatment at an average age of 24 months.
Surgical reconstruction aimed to achieve bilayered closure of the defect using hinged mucoperiosteal flaps and myomucosal orbicularis oris flap.
Results
Of 16 patients, 15 (93.7%) had the oronasal fistulae, uneventfully, healed within 2–3 weeks. One patient had partial breakdown without gapping of the nasal layer. The average operative time was 60 min. This flap can reach as far as 3–4 cm into the palate. Follow-up to 12 months has been completed with no evidence of recurrence. Preoperative symptoms of nasal regurgitation and hypernasality had significantly improved.
Conclusion
Medially based pedicled orbicularis oris myomucosal flap used in a bilayered pattern is a safe and reliable option for closure of anterior palatal defects.

Keywords:
anterior palatal fistula, cleft palate, oronasal fistula

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Introduction

Palatal defect is a common complication following cleft palate surgery. The main causes are repair under tension, infection, and/or tissue necrosis from ischemia. The usual presentation is persistence of nasal regurgitation and vocal hypernasality, especially if there is wide oronasal fistula [1].

In a meta-analysis, the rate of fistula occurrence was 4.9% [2]. Higher incidence has been found with delayed primary repair, especially with bilateral cleft lip and palate [3].

The anatomical location of the fistula can vary vastly but commonly occurs in the hard palate or at the junction with soft palate (type III/IV Pittsburgh Fistula Classification) (Fig. 1) [4]. They are further classified according to their sizes into small if less than 2 mm, medium 3–5 mm, or large more than 5 mm [5].

Treatment is tailored according to site, size, and clinical presentation. Despite wide range of surgical options have been tried, 25% recurrence rate is still expected after the first attempt of repair [6–8].

Anterior palatal defects, type V Pittsburgh, represents a challenging problem. They are constantly out of reach of mucoperiosteal flaps of sufficient length for reconstruction, more often when the fistula is surrounded by quite scarring from previous surgery.

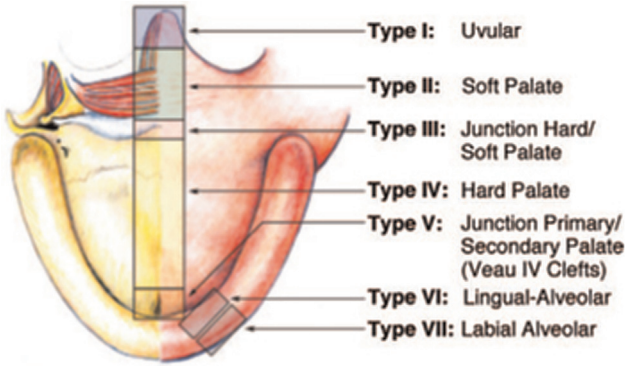
The current study aimed to discuss the results of reconstruction of secondary anterior palatal defects by medially based pedicled orbicularis oris myomucosal flap.

Patients and methods

In this retrospective study, 16 consecutive patients have been included from 2016 to 2019 (nine males and seven females, with the mean age 6 years; range, 6±1.4 years) in Zagazig University Hospitals. All the patients were enrolled after obtaining the approval from the institutional review board ethical committee.

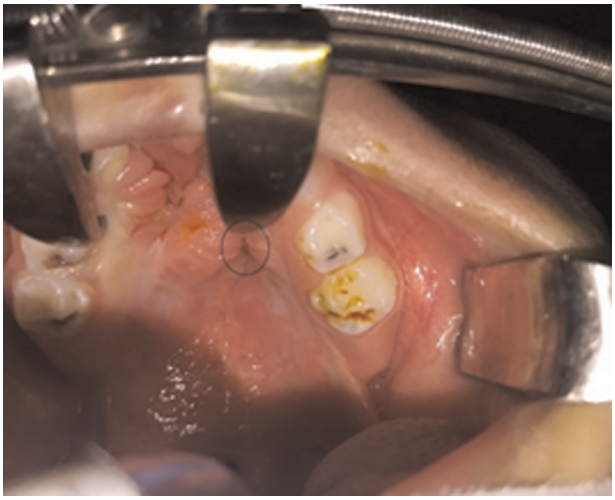
They were all presented with isolated secondary anterior oronasal fistula of ~6.6±2 mm size, classified as Pittsburgh type V – primary palate at incisive foramen or junction of primary and secondary palate (Fig. 2). There was no evidence for velopharyngeal incompetence in any of them. Assessment also involved intraoral examination for the availability of mucoperiosteal flaps and the existing amount of scarring from previous surgery.

Figure 1



The Pittsburgh Fistula Classification System. Standardized numerical classification system for palatal fistulas system terminology [4].

Figure 2



Intraoperative photograph showing secondary anterior palate defect, 4 mm in size, previous primary palate repair with Von Langenbeck technique. Moderate amount scarring can be seen.

The majority of them [11 (68%)] were bilateral and treated for primary closure by Von Langenbeck technique. Five patients were unilateral incomplete and had their primary cleft treatment at average age of 24 months. Six (37.5%) patients have residual fistula after revisional redo repair. After assessment in a multidisciplinary team, the proposed agreed plan was set for bilayered reconstruction by medially based pedicled orbicularis oris myomucosal transposition flap.

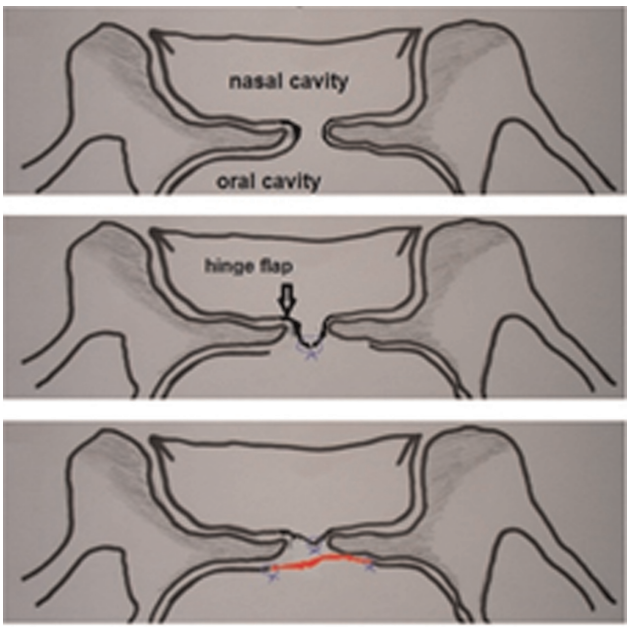
Technique

All patients included in this study were operated under general anesthesia with next-day discharge after satisfactory recovery. Local anesthetic with adrenaline infiltration in supine position with extended neck, and Dingman mouth retractor was applied. Intraoperative intravenous antibiotics were administered, and loupes magnification was utilized.

Surgical reconstruction aimed to achieve bilayered closure of the anterior palatal fistula. Incision is made first on oral side, resulting in raising two hinge mucoperiosteal flaps on either side of the fistula in the coronal plane, as shown in the diagram in Fig. 3.

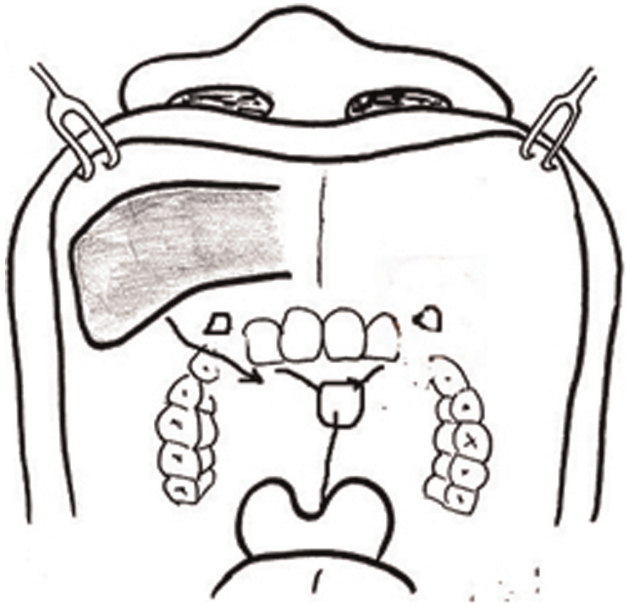
Orbicularis oris myomucosal flap was designed in the ipsilateral or contralateral upper gingivolabial sulcus, the better the geometry of transposition allows, with the flap pedicle designed as medially based toward the frenulum in level with incisors (Figs 4–6). Careful dissection of

Figure 3



Diagram, coronal view, showing the basic principle of the proposed procedure. Planning bilayered closure on the nasal and oral sides. The hinged mucoperiosteal flaps raised on either side of the fistula are marked by arrow while the myomucosal flap is drawn in red.

Figure 4

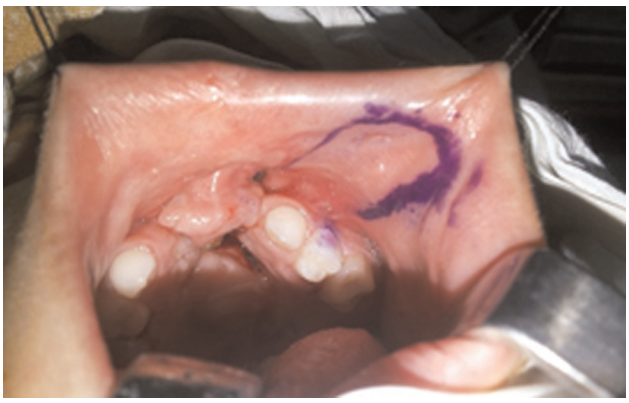


Schematic drawing of the proposed surgical technique. The shaded area represents the territory of the myomucosal orbicularis oris flap to be raised from inner upper lip.

Figure 5

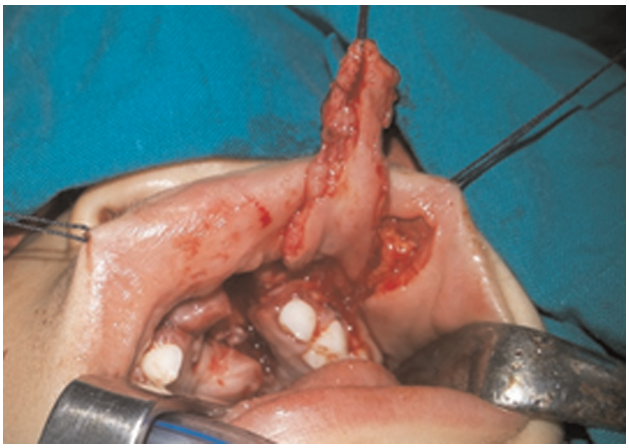
Preoperative view of anterior palatal fistula, 8 mm in maximum diameter, scarring from previous surgery, underwent the same procedure in this current study.

Figure 6



Flap is marked with appropriate measurement and pedicle orientation.

Figure 7



Nasal side is closed with two hinge mucoperiosteal flaps. Careful dissection of the flap pedicle to maintain vascularity and to gain the maximum reach.

pedicle was done to preserve muscular branches arising from superior labial artery and to obtain the desired flap length at the same time (Fig. 7). Flap was transposed and inset without undue tension through the alveolar cleft (Fig. 8). Extraction of the erupted canine could be considered occasionally with informed consent if hindering flap inset; this was not needed in this case series. After hemostasis is ensured, continuity of orbicularis is reinstituted, and donor site is closed primarily.

Postoperative care included oral antibiotics course prescription, and oral pain medications. Oral intake and soft diet were recommended immediately after complete recovery from anesthesia. Assessment of swallowing has been done by the Speech and Language Therapy (SALT) team. Patients were followed up in outpatient department in a week time, and then 2 weeks later. Extended follow-up for a year time was done in three monthly intervals.

Results

Of 16 patients, 15 (93.7%) had the oronasal fistulae uneventfully healed within 2–3 weeks. One patient had

Figure 8

Flap inset and palate defect is closed completely with bilayer reconstruction.

partial breakdown without gapping of the nasal layer. This needed longer time to heal, and eventually was completely closed. The average time to complete this procedure was 60 min. The postoperative recovery was smooth with no airway, bleeding, or feeding problems. In this current study, no partial of complete flap loss was observed. Only early mild swelling of the flap was observed, which has resolved spontaneously. No donor site morbidity had developed.

With careful dissection of the pedicle, this flap can reach as far as 3–4 cm into the palate. Similarly, the nasal side can be closed with raising the two hinged mucoperiosteal flaps from either side of the fistulae with good length from the oral side, even when previous scarring present, provided more than 6 months have elapsed from primary cleft palate repair procedure.

Follow-up to 12 months has been completed with no evidence of recurrence. Preoperative symptoms of nasal regurgitation and hypernasality had significantly improved (Figs 9 and 10).

Discussion

Oronasal fistulas of anterior palate, postcleft lip and palate surgery, represent challenging situation. The size of the fistula, its location, and the cause of the defect are important factors to determine the type of treatment and surgical technique. Treatment can be difficult because of anatomical site restraint, the residual scarring from previous surgery, and the lack of local tissue available for reconstruction [6].

Figure 9

Complete healing at 6-month follow-up. Donor site is soft with no obvious morbidity.

Figure 10

Well-settled reconstruction of anterior palate defect with no evidence of recurrence at 12-month follow-up.

This study aimed to discuss the outcome of reconstruction of these defects using medially based transposition orbicularis oris myomucosal flap, as a versatile treatment option when properly indicated and well planned. The use of this flap to reconstruct this type of fistula has been rarely described in the literature.

Being safe and reliable is the principal advantages beyond this proposed bilayered reconstruction with medially based transposition orbicularis oris

myomucosal flap. The flap has well-defined and consistent blood supply, which obviates using random flaps that are associated with increased risk of ischemia and recurrence [9]. Appropriate flap length can be gained with careful dissection; therefore, the flap can achieve closure of anterior palate defects.

Compared with other local option procedures such as two-stage tongue flap, with known risk of spontaneous detachment from the palate [10], this technique is safer and easier to adopt as a single-stage reconstruction without donor site morbidity, which is closed primarily. Moreover, no anesthetic complications seen as encountered during tongue flap division, when usually there were increased risk of hemorrhage and intubation difficulties [11].

Oral soft diet can be resumed early after surgery, which was not possible with other complex reconstruction procedures [9].

The flap closely resembles the palatal mucosa in texture. This relatively thick composite myomucosal flap was quite beneficial in obliterating the dead space between the two layered closure.

Although it is a good choice for reconstruction of anterior palate defects, this flap has some limitations in coverage of wide defects, in particular elderly children who have the canine erupted.

Ultimately, using pedicled medially based orbicularis oris myomucosal flap for the repair of this type of defects has shown promising results, becoming a safe and effective method.

Conclusion

The use of medially based pedicled orbicularis oris myomucosal flap, in a bilayered reconstruction pattern, is a safe and reliable technique for closure of secondary anterior palatal defects following primary cleft palate repair. It allows successful closure of challenging anterior defects when previous scarring preclude re-repair owing to shortage of mucoperiosteal tissue around the defect. The technique was successful in avoidance of more complex procedures, which could result in greater morbidity and possible subsequent recurrence.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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