Tongue Flap in Treatment of Oronasal Fistula in Cleft Palate: A Case Series

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ABSTRACT
Oronasal fistula (ONF) is probably the commonest complication encountered in cleft palate surgery. Most of the ONF are situated at the junction of hard and soft palate and its repair depends on the site, size and mode of presentation. There are many surgical procedures employed in closure of ONF. A double layer closure with tongue flap cover, especially for large fistulae can provide a good success rate.

Key words: Cleft palate, oronasal fistula, tongue flaps.

INTRODUCTION
Oronasal Fistula is an abnormal communication between oral and nasal cavities occurring after surgical repair, and is the commonest complication associated with cleft palate surgery. Rate of ONF being 4-34% or even more in cases of primary palatoplasty [1,2].

The causes are variable, ranging from trauma, tumor, irradiation to very rare infectious diseases (midline granuloma, syphilitic gumma, leprosy or leishmaniasis) [3]. ONF primarily develops due to breakdown of primary palatal repair due to repair under tension and in few cases due to postop infections (Especially in adults). Symptoms depend on size, position and velopharyngeal incompetence with 2 main symptoms being nasal regurgitation and speech problems.

The aim of primary treatment/surgery (palatoplasty) of cleft palate is that it should result in an intact palate with separation of oral and nasal cavities. Tongue flaps were introduced for intraoral reconstruction by Lexer in 1909 [4].

The excellent vascularity and large amount of tissue have rendered tongue flaps appropriate for repair of large fistula in palate scared from previous surgeries.

SURGICAL TECHNIQUE
The operation was performed with the patient under general anaesthesia. After routine intra and extra oral sterile preparation, fistula edges were injected with 2% lignocaine and 1:200,000 adrenaline for hemostasis and for ease of dissection (Figure 1).

Incision was made around the fistulous tract (Figure 2).

The nasal mucosal layer was dissected and raised along with the hinge flap and sutured with 5-0 catgut by everting mattress suture under minimal tension so as to attain a good approximation of raw edges and form a good lining over which the tongue flap cover could be placed (Figure 3).

The length of the tongue flap was designed such that 1-2cm of additional tissue would span the posterior edge of palatal defect (Figure 4).

With the tongue in an unstrained position, a dorsal flap with an anteriorly based pedicle was designed and width corresponding to width of defect plus 20%. The anteriorly based tongue flap was raised and mobilized including 2-3mm of muscle thickness to
allow for adequate vascularization and donor site was closed with 4-0 catgut (Figure 5). Tongue flap was rotated forward and inset to raw edges of defect using 5-0 catgut (Figure 6, 7). After 3 weeks, the flap was divided (Figure 8, 9, 10).

**LEGENDS**

**Figure 1:** Oronasal fistula with infiltrated edges.

**Figure 2:** Incision made around fistulous tract.

**Figure 3:** Nasal layer closure with inverting mattress.

**Figure 4:** Tongue flap marked.

**Figure 5:** Tongue flap raised and donor site primarily closed.

**Figure 6:** Inset given to recipient defect.

**Figure 7:** Post op.
CASE REPORTS

CASE 1: Ms. Summayath, 17 yr old girl who is a follow up case of cleft lip and palate and has undergone pushback palatoplasty from outside centre, presented with complaints of nasal regurgitation of food and altered speech. On examination of oral cavity, a large defect on the palate (Type V ONF) which was roughly triangular in shape, located at junction of primary and secondary palate and measuring 6mm.

CASE 2: Ms. Rubeena, 17 yr old girl, follow up case of CLP, with similar history. On examination revealed Type V ONF measuring 5mm.

CASE 3: Mr. Fajish, 12 yr old boy with similar history, on examination revealed Type V ONF measuring 7mm.

DISCUSSION

Repairing oronasal fistula defects is one of the most challenging and difficult problems. Based on size, fistula may be classified as small (<2mm) medium(3-5mm) and large (>5mm). The Pittsburgh Fistula Classification System can be used to describe the location of fistula as Type I: bifid uvula; Type II: soft palate; Type III: junction of the soft and hard palate, Type IV: hard palate; Type V: junction of primary and secondary palate, Type VI: lingual alveolar and type VII: labial alveolar.

In a study of 64 patients, Diah Lo yuan et al, reported the hard soft palate junction as commonest site (53.1%). Although small fistula of hard palate can often be repaired by local tissue, large palatal fistula requires transfer of non palatal flaps. The tongue with its rich blood supply is a suitable and convenient source of such tissue. The deep lingual artery courses anteriorly, deep to the ventral mucosa. It gives off multiple branches that ascend toward the dorsum of the tongue. Cadenat et al, have described the rich submucous vascular plexus found in the tongue. This plexus allows for safe and predictable elevation of thin flaps.

The Facial Artery Musculo Mucosal (FAMM) flap, as introduced by Pribaz et al, is a valuable option to reconstruct moderate size defects of anterior palate. The FAMM flap has a few drawbacks, the pedicle may be injured during mastication, the incorporation of the flap for 3 weeks is bothersome, the mucosal paddle is somewhat bulky and requires resurfacing at a later date. Furthermore, speech therapists discourage the use of this flap that will likely interfere with further speech development.
The anteriorly and posteriorly based dorsal tongue flap, lateral, central and ventral tongue flaps have been used to cover ONF. Inspite of disadvantages like functional loss of speech and swallowing, a tongue flap can overcome the usual limitations with advantages like using adjacent tissue, less donor site morbidity, good vascularity, easier technique to raise, transfer to the recipient site and no scar formation. Excellent vascularity ensures viability of the flaps, thus enhancing the success of this simple method for closing large palatal defects. The tongue flap becomes reinnervated from the adjacent host tissue. The tongue flap should be about 6mm thick and include adequate underlying muscle because it is a random pattern flap. With a single layer closure the recurrence rate of fistula was about 40%, hence a single layer closure should be avoided. Rate of recurrence for hard palate ONF after complete redo is < 5%. Recurrence of ONF at junction of hard and soft palate is nil.

CONCLUSION
Oronasal fistula is the commonest complication of cleft palate surgery. Surgical techniques starting from local flaps to free tissue transfer have been employed depending on the site, size and tissue available. Excellent vascularity and tissue availability that the tongue flaps provide have made the tongue flap appropriate for ONF closure of medium to large fistulas. One should always keep in mind the absolute necessity of double layer closure; lining and cover principle. This is vital for a good success rate.

BIBLIOGRAPHY


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