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RESEARCH ARTICLE

ANTERIORLY BASED TONGUE FLAP FOR REPAIR OF PALATAL FISTULA IN CLEFT PATIENTS

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ABSTRACT:

Aim: The aim of the study was to evaluate the success of using anteriorly based tongue flap for the success of closure of the palatal fistula which have failed earlier attempts of closure. Materials and Methods: A total of 15 patients of cleft palate were included in the study who underwent closure of the palatal fistula with the help of tongue flap. All the fistulas had earlier failed other modalities of closure. The patients were evaluated for the success of the flap after 6 months by clinical examination. Results: Out of the 15 patients only one patient had flap necrosis and one had suture dehiscence. The healing was adequate in other patients with decrease in the hyper nasality and regurgitating. One patient showed intraoperative complication of hemorrhage which was managed without further complication by local haemostasis methods. Conclusion: Tongue flap is one of the best options for closure of the palatal fistula without any further complications.

Keywords: Tongue flap, palatal fistula, cleft, anteriorly based tongue flap

INTRODUCTION

Palatal defects can be congenital or acquired. Palatal fistula are the common complication seen following palatoplasty. An incidence of 8% to 40% has been reported in the literature. [1]

Palatal fistula are commonly seen in the junction of hard and soft palate , but can also be seen in anterior part of hard palate more in case of bilateral complete cleft lip and palate . Various local and regional soft tissue flaps have been used for fistula closure including nasolabial flaps, buccal musosal flaps, buccinator-musculo-mucosal flap, temporalis muscle flap, buccal pad of fat.[1] Initially Thierch in 1868 described palatal fistula closure using superiorly based nasolabial flap. Tongue flap was introduced by Lexor in 1909 [2] as a treatment modality for intraoral reconstruction. Klopp and Schurterin 1956 [3] was the first one to describe the use of the tongue flap to repair the palatal defects. Palatal fistula are difficult to close because of the associated scarring of local tissues due to prior surgeries. Several proposed designs for the tongue flap are anteriorly and posteriorly based, dorsal tongue flap, lateral tongue flap, central tongue flap, median transit flap[4]. The anteriorly based dorsal tongue flap has been demonstrated to be the most

reliable flap by several authors. [1,2,3,4,5,6]The success of flap is dependent on length, width, and thickness of the harvested flap.

Numerous studies have been carried out to prove the versatility tongue flap in successful fistula closure and intraoral reconstruction.

MATERIAL AND METHODS:

In this clinical study 15 operated patients for cleft palate were included. The age of the patient ranged from 15 to 45years. In all these patients there was palatal defect (oro-nasal fistula) due to wound dehiscence after the repair of cleft palate. 8 patients presented with anterior palatal fistula, 5 patients presented with fistula at the junction of hard and soft palate and 2 patients presented with fistula at soft palate. All patients had failed attempt of fistula repair on previous occasions using other techniques. The size of the fistula was variable ranging from 0.5 to 2. 5 cms. All the fistula which were intended for repair were symptomatic in the form of nasal regurgitation and hyper nasal speech. All patients selected were intended for repair using anteriorly based tongue flap.

Operative Technique:

The procedure was carried out under general anesthesia. Orotracheal intubation was done. All aseptic measures were followed. The scar tissue from the margin of the palatal fistula was reflected using peri-fistualar incision and nasal layer was reconstructed using turnover flap from both sides. Retraction suture was placed to protrude the tongue out. Marking for anteriorly based tongue flap was made on the dorsal surface of the tongue. [Figure 1B, 2B] Anteriorly based tongue flap was then harvested. [Figure 1C, 2C] The harvested tongue flap was sutured to the margin of the defect using 3-0 vicryl. [Figure 1D, 2D]The length of the flap was long enough to reach the defect with adequate tongue mobility. The thickness of the flap was variable depending on the depth of the defect, including the mucosa and the partial thickness of the muscular layer. Complete haemostatis was achieved. The donor site was closed using 3 – 0 vicrylresorbable suture. Immobilization of the jaw was not carried out in any of the patients.

Second stage surgery was planned approximately after 21 days following pin prick test. Pedicle was divided. (Figure 2E) The free end was repositioned and sutured to the donor site.

The efficacy of the anteriorly based tongue flap was evaluated after 6 months on the basis of the clinical parameters including proper healing any evidence of retained fistula, presence and absence of nasal regurgitation and subjective reduction of hyper nasality

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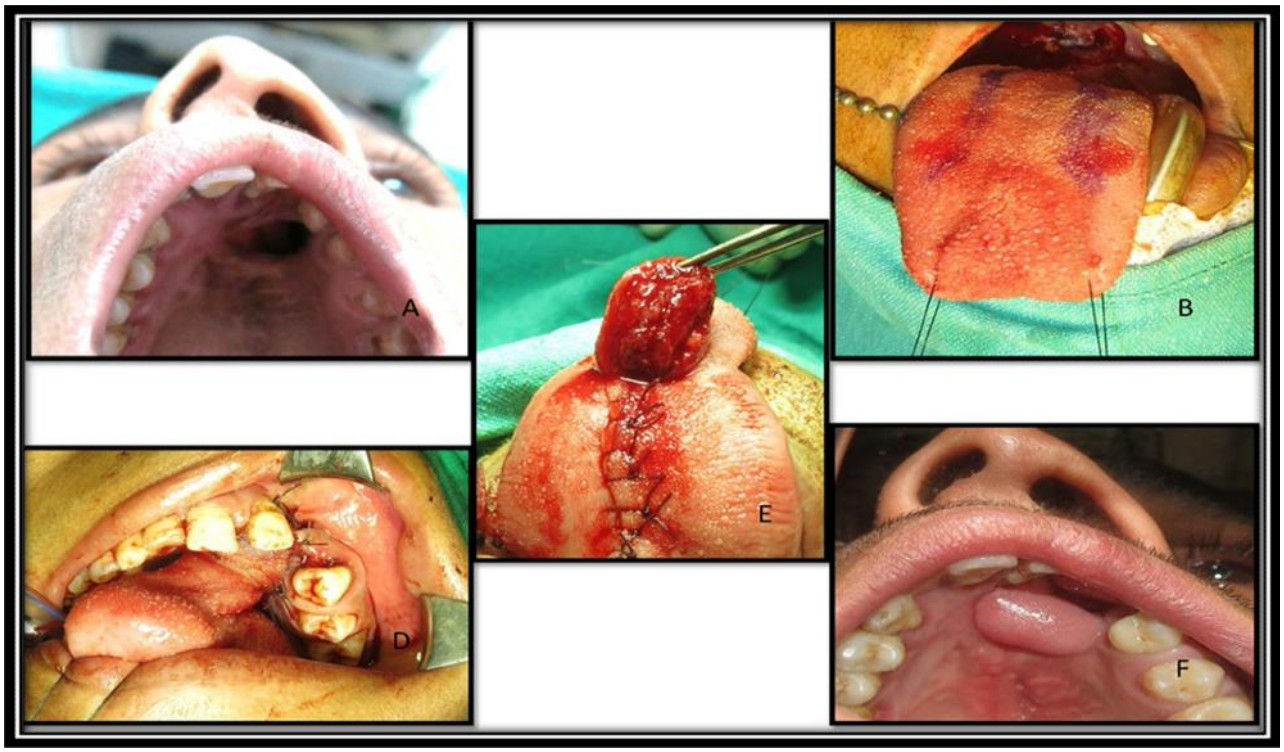

Figure 1: A. Palatal fistula of the anterior palate; B: Marking of the tongue flap; C: Raised Tongue flap; D: Tongue flap in position; E: Healed flap

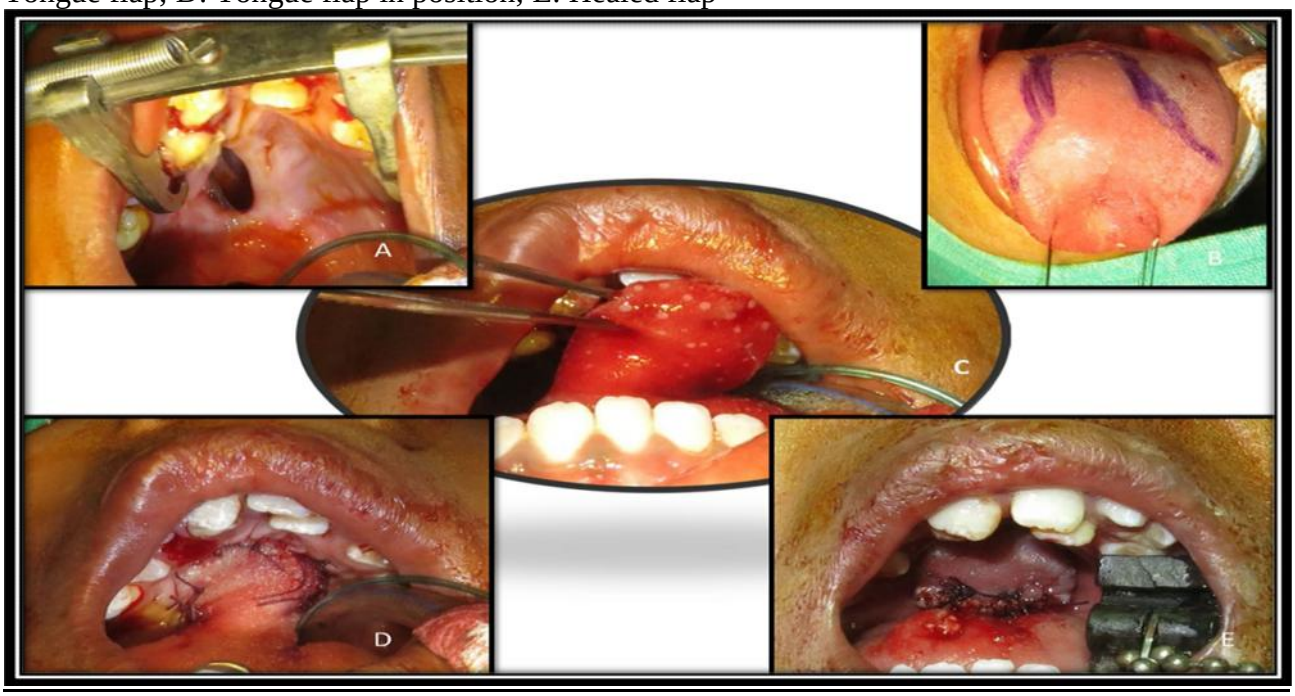

Figure 2: A. Palatal fistula of the posterior palate; B: Marking of the tongue flap; C: Raised Tongue flap; D: Tongue flap in position; E: Healed flap and pedicle detachment

RESULTS:

15 patients were included in the study who underwent treatment for palatal fistula repair using anteriorly based tongue flap. The age of the patient ranged from 15 to 45 years. Among 15 patients, there were 11 males and 4 female patients. In 8 patients the fistula was present in anterior region of hard palate, in 5 patients the fistula was present at the junction of hard and soft palate.in two patients there was fistula present in soft palate which is little rare in occurrence. [Table 1,Table 2, Table3] There wasno intraoperative complication seen except in one patient in whom there was increased blood loss a little more than expected, but satisfactory haemostasis was achieved by using local methods of haemostasis.[Table 1]

As already mentioned the efficacy of the flap was evaluated using clinical parameters. Flap was adequately accepted by the recipient site except in two patients. In one patient there was flap margin necrosis and in one patient there was suture line dehiscence.[Table 2] Both were corrected using additional surgical procedure. Hyper nasality decreased in 13 out of 15 patients. In two patients there was persistent nasal regurgitation due to the presence of occult fistula. It required third procedure to resurface the tongue flap and was therefore corrected.

Table 1: PATIENT WITH ANTERIOR PALATAL FISTULA

Patient	Age / Sex	Diagnosis	Intra op Complications	Post Operative Clinical Evaluation			
				Healing	Hyper nasality	Fistula Closure	Nasal regurgitation
1	24/ M	CLP Lt sided	Absent	Adequate	Reduced	Adequate	Absent
2	18/F	CLP Lt sided	Absent	Adequate	Reduced	Adequate	Absent
3	21/F	CLP Bilateral	Absent	Adequate	Reduced	Adequate	Absent
4	35/ M	CP right side	Absent	Suture line dehiscence	Reduced	Adequate	Present
5	45/ M	CLP right	Absent	Adequate	Reduced	Adequate	Absent
6	32/ M	CLP left	Absent	Adequate	Reduced	Adequate	Absent
7	17/ M	CLP left	Absent	Flap Margin necrosis	Reduced inadequately	Inadequate	Present
8.	28/ M	CLP right	Absent	Adequate	Reduced	Adequate	Absent

Table 2: PATIENT WITH FISTULA AT JUNCTION OF HARD AND SOFT PALATE

Patient	Age / Sex	Diagnosis	Intra op Complications	Post Operative Clinical Evaluation			
				Healing	Hyper nasality	Fistula Closure	Nasal regurgitation
1	45/M	CLP right	Absent	Adequate	Reduced	Adequate	Absent
2	25/M	CLP bilateral	Absent	Adequate	Reduced	Adequate	Absent
3	27/M	CP right	Hemorrhage	Adequate	Reduced	Adequate	Absent
4	39/F	CP left	Absent	Adequate	Reduced	Adequate	Absent
5	15/F	CLP left	Absent	Adequate	Reduced	Adequate	Absent

Table 3: PATIENT WITH FISTULA AT SOFT PALATE.

Patient	Age / Sex	Diagnosis	Intra op Complications	Post Operative Clinical Evaluation			
				Healing	Hypernasality	Fistula Closure	Nasal regurgitation
1	29/M	CLP	Absent	Adequate	Reduced	Adequate	Absent
2	32/M	CLP	Absent	Adequate	Reduced	Adequate	Absent

DISCUSSION

Occurrence of palatal fistula as a result of break down of cleft palate repair is not a rare complication reported with variable percentage of occurrence.[4,5,6] This results in functional compromise,[5] therefore making it mandatory to close such fistula. According to the study carried out by Briella Passo Et Al in year 2014 the prevalence of occurrence of palatal fistula was 27%.[7]

Various anatomic locations at which fistula can be seen is at uvula, soft palate, junction of soft and hard palate, or at incisive foramen.[8,9] Depending on the site and size of the fistula, various treatment modalities can be used ranging from local flap, regional flap to free flap.[10,11,12] Among all the available option tongue flap has been the most versatile flap particularly in those where the modality for closure of such fistula have exhausted.[13,14,15,16] It is based on the lingual artery and submucosal plexus.[17] Anteriorly based tongue flap is considered random pattern flap based on submucosal plexus whereas posteriorly based flap is axial pattern flap containing profound lingual artery.[3]

Closure of palatal fistula using tongue flap have shown to improve the speech defect as suggested by Kulner and Neeale.[18]Similar results were encountered as in thirteen out of our fifteen patients there was improved speech due to reduction in hyper nasality.

Various parameters that guide the success of tongue flap include sufficient length of the flap, adequate width of the flap according to the size of the defect, thickness of the flap of 0.5cm as suggested in the literature.[19,20]

Various post operative complication of using tongue flap as seen in the past include hemorrhage, hematoma, epistaxis, transient loss of taste sensation.[20,21] One rare and late complication of occurrence of nasal papilloma has been reported in using tongue flap for fistula repair.[22]

Anteriorly based tongue flap have various advantages over posteriorly based tongue flap that guided us to choose the former, these have greater range of mobilityand ease of division of pedicle.[19] In all our patients flap division was done under local anesthesia and GA was not required. Anteriorly based flap is random pattern flap so bulky flap is not required, thereby preventing debulking procedure.[3,14]

Tongue flaps have always been proved to be a versatile flap. Along with there use in repair of palatal fistula they can be used in other maxillofacial procedures including repair of oroantral communication, lip reconstruction and reconstruction of hypopharynx.

According to our clinical experience anteriorly based tongue flap are effective for closure of oronasal communication. Although it is not a primary choice and only reserved for patients with fistula in whom other options have exhausted. There were few minor complications in few cases but they could be managed adequately.

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