

Further Experience with Tongue Flap in Cleft Palate Repair

JOSE GUERRERO-SANTOS, M.D., F.A.C.S.*
JOSE MARIA FERNANDEZ, M.D.*

Guadalajara, México

Tongue flap has been used in primary (1) and secondary (2, 3) repair of cleft palate in our practice covering a period of ten years. Many reports (3, 14, 15, 16, 17, 23, 27) of the use of tongue flap in oral repair refer to the reconstruction of defects in oncological surgery, noma, syphilis, leprosy and naso-palatine fistulas following cleft palate surgery. In this report we shall refer to our experience in the solution of different problems on cleft palate.

Primary Closure of the Alveolus and Anterior Part of the Hard Palate

The closure of the alveolus and anterior part of the hard palate in cases of wide, complete cleft palate is a problem difficult to solve. The closure of the alveolus can be done simultaneously with the application of bone graft or without it. In our service, bone graft is used only occasionally. Several reported procedures exist for the reconstruction of the palatine alveolus, in which bone grafts are used (24, 25). The bone grafts should remain perfectly covered with mucosa. This covering is obtained by sliding interpolated flaps from neighboring areas such as the nasal septum, vomerian region, lip, palate, and the alveolus itself. In order that the bone integration and the repair be successful, the flaps should have a certain thickness and adequate circulation. There are patients with whom the surgeon has difficulties in sliding flaps because they have fibrous tissue in the surrounding areas due to infections, inflammations, or previous surgery. Furthermore, there are patients with thin mucosas in which there can be difficulty also in the formation of flaps because, at the time of the suture, they become pale due to circulatory difficulty or a tear at the edges. Based on our experience in the management of tongue flap, we have made an extension of its use to the primary repair of the alveolus and of the anterior hard palate (1), in those patients in whom we cannot obtain flaps of good quality from neighboring areas.

TECHNIQUE. A flap taken from the tip of the tongue is used. It is of adequate size depending on the size of the cleft in the alveolus and

* From the Division of Plastic and Reconstructive Surgery, Graduate School, Medical and Dental College, University of Guadalajara.

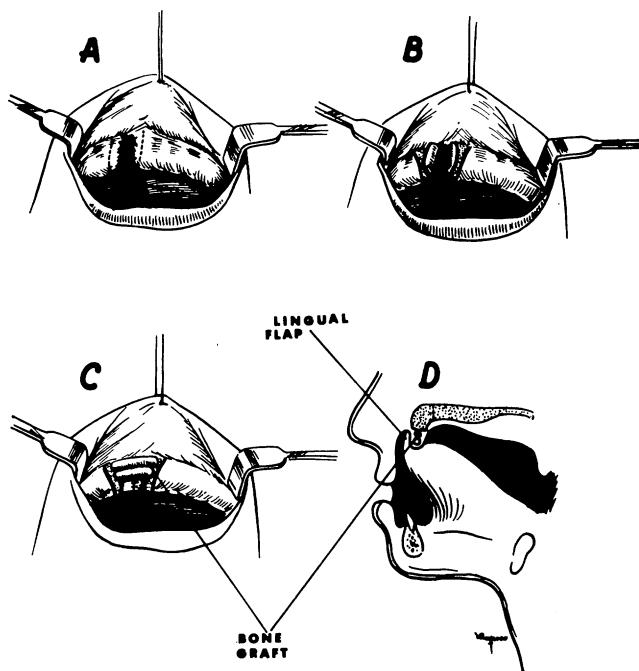


FIGURE 1. Closure of the alveolus of the anterior part of the hard palate with bone graft and tongue flap.

anterior part of the hard palate. Previously, two small rotation flaps (Figure 1a & 1b) are taken from the portion of the alveolus situated in the cleft, and with them we partially covered the bone graft (Figure 1c). Over these structures we apply the tongue flap (Figure 1d), suturing its distal end to the upper lip to provide the flap with greater fixation. The bone graft is covered in its upper part by the flaps of the alveolus itself, and in its anterior, inferior, and posterior parts by the tongue flap. After three weeks we section the pedicle of the tongue flap.

ADDITIONAL COMMENTS. With the closure of the alveolus and of the most anterior part of the palatine cleft, we prevent both a collapse and the formation of nasopalatine fistulas, and facilitate the utilization of further retroposition techniques. Also, we consider that the bone grafts have a better chance to integrate themselves and subsist when they have a better, thicker and more irrigated epithelial cover.

Secondary Closure of Nasopalatine Fistulas

Many authors (4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 29, 30), for covering large fistulas in the hard palate and alveolus, have reported a multitude of complicated procedures with multiple surgical stages and using tubular or pedicled flaps, or free neo-vascularized grafts of extraoral tissue. Our group and some other authors (1, 2, 3, 19, 20, 21, 22) are in agreement

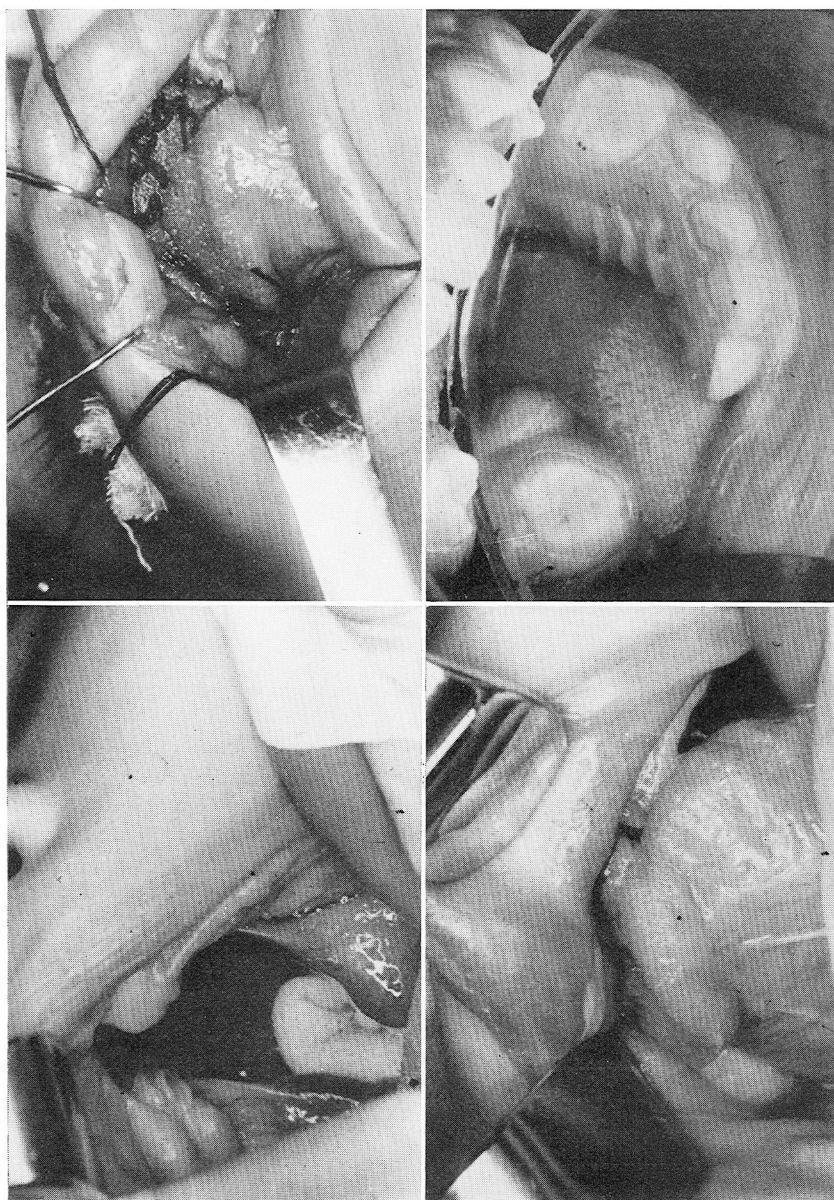


FIGURE 2. Reconstruction of the alveolus, using tongue flap. (A) (top left) Preoperative. (B) (Top right) Tongue flap sutured to the alveolus according to the technique in Figure 1. (C) (Bottom left) Three weeks later, before sectioning the pedicle of the flap. (D) (Bottom right) View of the alveolus and fore part of the hard palate two years after surgery.

that, when it is not possible to close a fistula with tissues belonging to the palate, the best place for obtaining flaps to close these defects is the tongue. Massengill, Pickrell and Mladick (21) reported recently that the lingual flap procedure has not developed adverse effects on speech articulation and physiology.

Although there are many reports that speak enthusiastically of the use of tongue flap in the secondary repair of nasopalatine fistulas, some surgeons (26) are afraid to use tongue flap in palatine repair, thinking that the tongue's natural mobility will impede the correct healing of the flap; and, in fact, this can happen if certain precautions are not taken to keep the flap from coming loose from the donor zone.

In our early cases we formed the tongue flap and sutured it to a palate flap or to the tissues of the areas neighboring the fistula. With this technique we were successful in a good number of adult patients, but we had some failures in children. This made us think it over and look for methods of controlling the tongue's movements.

Now we can say that, in addition to the original method of simple fixation, we have three more methods of controlling tongue movement: double fixation, triple fixation and waltzed tongue flap.

THE METHOD OF SIMPLE FIXATION. This method (Figure 2) has been described previously (2) and in this report we are going to add some comments on our experience of the past few years. In different cases we have tried anterior, posterior, and lateral pedicles, and it seems to us that the anterior pedicle is best and that the flaps should be wide and thick (adding

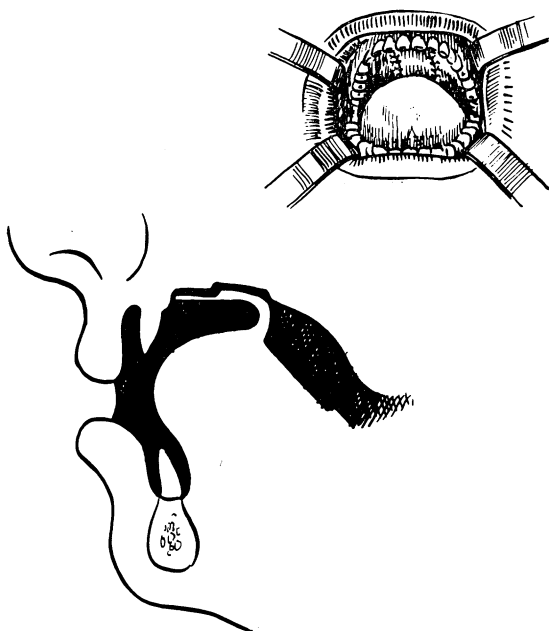


FIGURE 3. Application of tongue flap by the method of simple fixation. (See text for details).

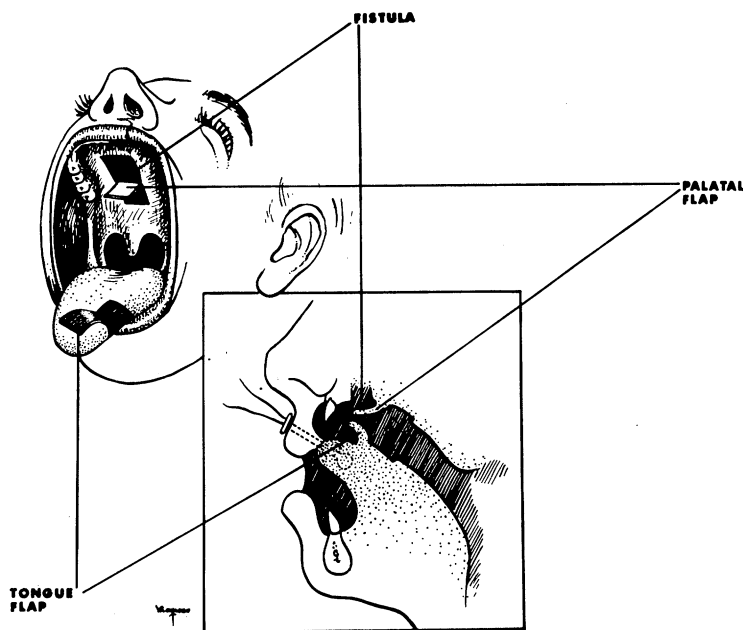


FIGURE 4. Double-Fixation method. (See text for details).

a certain amount of muscular tissue) and that they can be obtained either from the midline or from the edges of the tongue. Definitively we use this method exclusively in adult patients.

THE METHOD OF DOUBLE FIXATION. The tongue flap is applied in the same way as in the previous method, only adding a point of fixation by joining two flaps formed at the tip of the tongue and the upper lip (Figure 3). Besides making a suture at the edges of the flaps, we add a little wire which is looped into the tongue, with its ends passing through the lip to a button (to avoid damage to the skin). We use this technique in children and adults.

THE METHODS OF TRIPLE FIXATION. To the method of double fixation is added a posterior fixation point by laterally piercing the tongue at the angle of the mandible with Kirschner wire just as Hadley and Johnson (28) suggested for cases of Pierre Robin's syndrome, in order to prevent the tongue from falling backwards (Figure 4). This, in fact, immobilizes the tongue almost completely, and with the elimination of movements and tension, the healing of the flaps is excellent.

THE METHOD OF THE WALTZED TONGUE FLAP. This method is being suggested for the first time. There is transfer of tongue tissue in three surgical stages. In the first stage, a pedicle flap is formed on one side of the tongue and it is sutured to a raw area formed in the cheek by detaching a flap of adequate dimensions (Fig 5a). The tongue flap is sutured to the cheek, and the donor zone is closed (Figure 5b). The flap is left "Waltz-

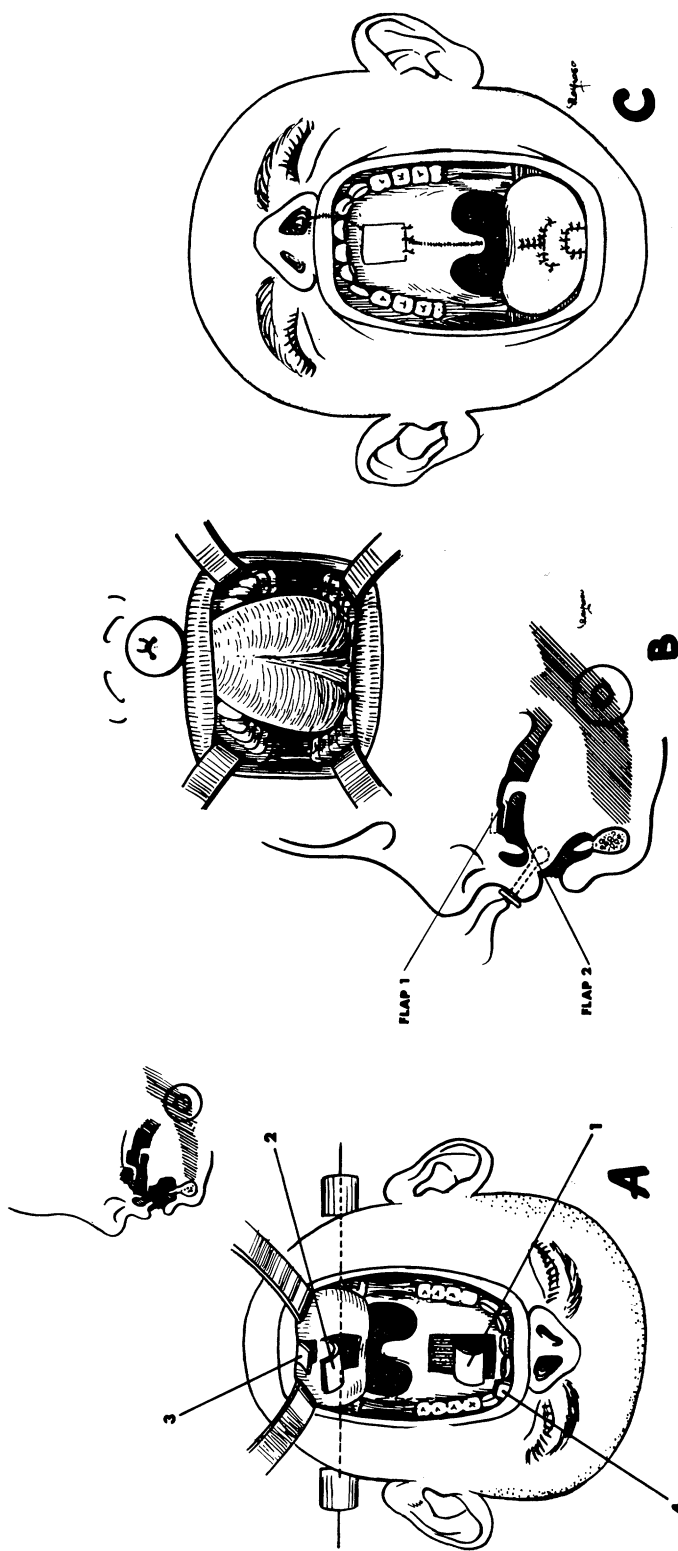


FIGURE 5. Triple fixation method. The closure of the fistula is done by combining flaps 1 and 2. The tongue is immobilized at 3 principal points, with: anterior fixation by joining flaps 1 and 2, with which the fistula is also closed, and posterior fixation done by piercing the tongue with a Kirschner wire which is introduced at the angle of the mandible.

FIGURE 6. (A) A large fistula of the hard palate. (B) Appearance of the tongue flap after sectioning the pedicle. (C) View of the flap one year after the plasty.

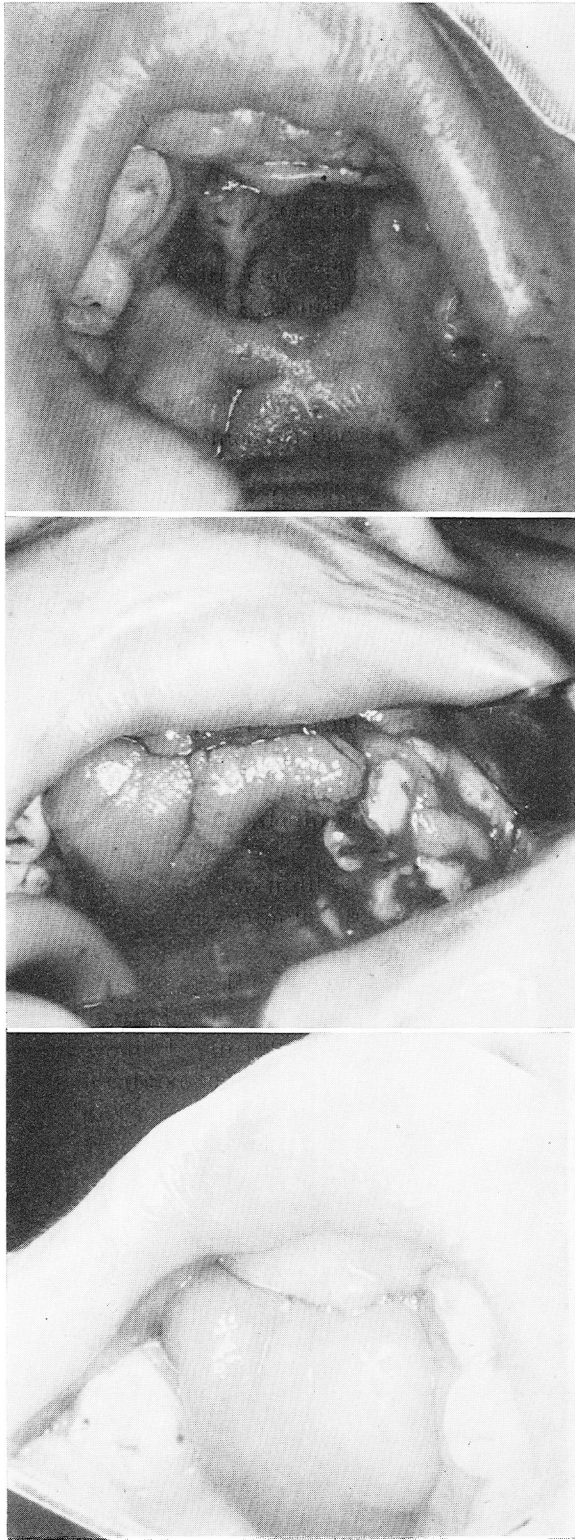




FIGURE 7. The method of the waltzed tongue flap. (See text for details).

ing" in this position for a period of three weeks, and in the second surgical stage the lingual pedicle is sectioned and by combining with a palate flap, the fistula is closed (Figure 5c and 5d). The pedicle of the flap, which carries circulation of blood from the cheek to the palate, is left in place for three weeks, after which it is sectioned.

In our surgical service, more than 150 transplants from the tongue to the lips and also to the palate have been made, and we have observed that the healing of the flap never fails in transplants to the lip. The main reason for this is that, when the tongue moves, the lip also moves, which does not happen with the hard palate because the latter is fixed. When the flap is sutured to the cheek, the same thing happens as when it is sutured to the lip. The tongue and the cheek also move together; thus the healing is not hindered. The transference of the flap from the cheek to the palate entails no problem of movement and we only recommend that the flap should never be in tension, but should be extra long so that, if the patient yawns, the flap will not be placed under tension.

Comments

The surgeon who is going to use tongue flap in the repair of nasopalatal fistulas has several surgical methods available and will choose the best one for his patients, depending both on the patient's age and on his

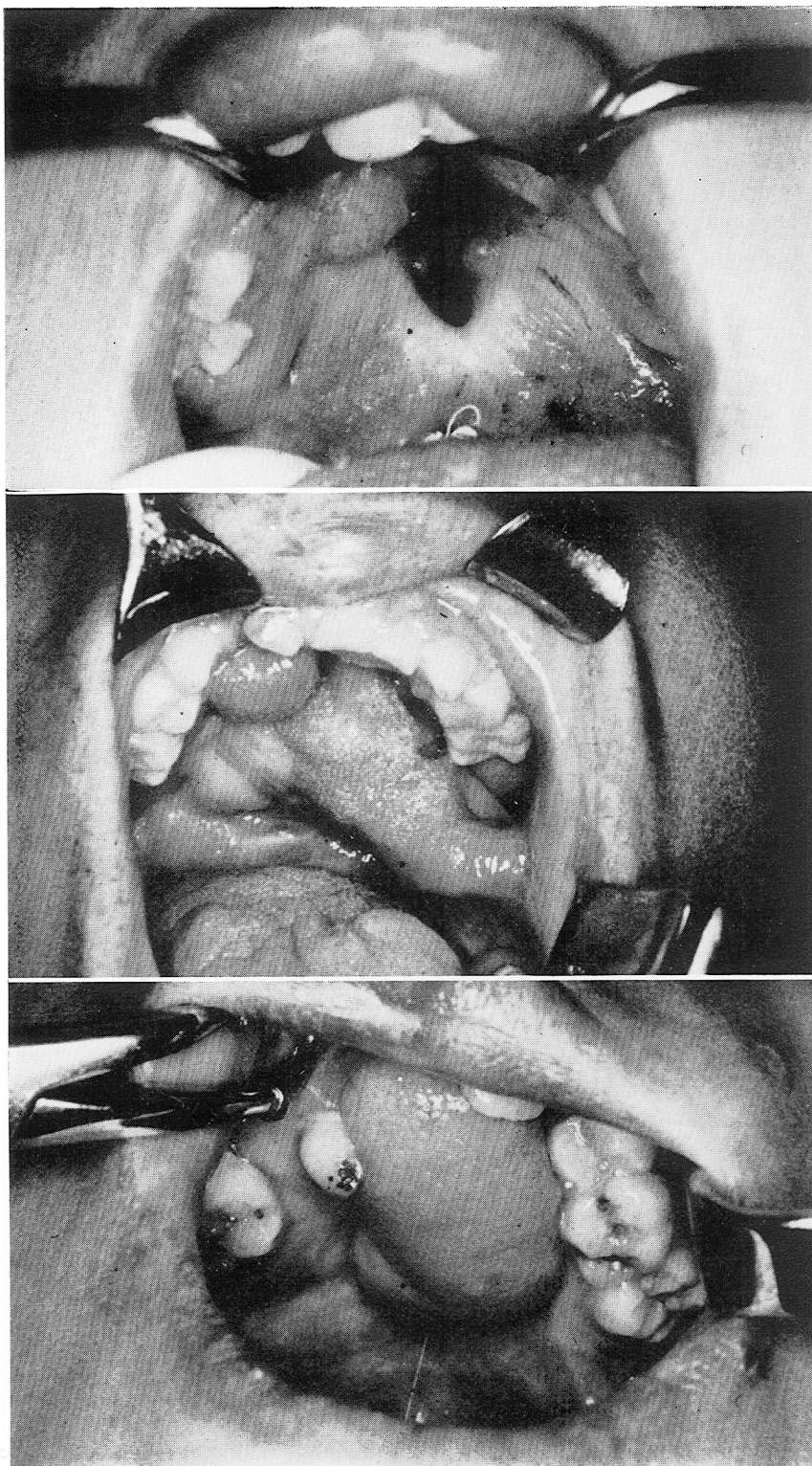


FIGURE 8. (A) (Top) Nasopalatal fistula in the hard palate. (B) (Center) Tongue flap closing the fistula with pedicle attached to cheek. (C) (Bottom) One year after surgery.

psychological characteristics. No matter how much tissue has been taken from the tongue, we have observed no speech problems.

Orthodontic treatment can be carried out successfully after having done the lingual transplant.

Summary

A report is presented on the use of tongue flap in cleft palate repair, various surgical techniques being shown. A combination of fixation points and methods are suggested for immobilizing the tongue.

References

1. GUERRERO-SANTOS, J., New hints on the use of tongue flap in cleft palate repair. Presented at the 1972 Annual Meeting of the American Cleft Palate Association. Phoenix, April 1972.
2. GUERRERO-SANTOS, J., and J. T. ALTAMIRANO, The use of lingual flaps in repair of fistulas of the hard palate. *Plast. & Reconstr. Surg.* 28: 123, 1966.
3. GUERRERO-SANTOS, J., J. GARAY, A. TORRES, and J. T. ALTAMIRANO, Tongue flap with triple fixation in secondary cleft palate surgery. In Transactions of the Fourth International Congress of Plastic Surgeons. p. 396, Excerpta Medica Foundation. Amsterdam, 1969.
4. ASCHAN, P. E., The reconstructions of large defects in the palate or the cavity of the mouth, using a tubed flap. In Transactions of the I Congress of the International Society of Plastic Surgeons, Stockholm 1955, p. 219. Williams and Wilkins Co., Baltimore, Md. 1957.
5. CAMPBELL, R., Fistulae in the hard palate following cleft palate surgery. *Brit. J. Plast. Surg.*, 15:377, 1962.
6. CUPAR, I. An operative procedure for transferring the tube pedicle flap into the mouth. In Transactions of the I Congress of the International Society of Plastic Surgeons, Stockholm, 1955, p. 216, Williams and Wilkins Co., Baltimore, Md., 1957.
7. GILLIES, J. and A. J. EVANS, Experience of the tube pedicle flap in cleft palate. In Transactions of the I Congress of the International Society of Plastic Surgeons, Stockholm 1955, p. 208, Williams and Wilkins Co., Baltimore, Md., 1957.
8. HYNES, W., The examination of imperfect speech following cleft palate operations, *Brit. J. Plast. Surg.*, 10: 114, 1957.
9. KOSTRUBALA, J. F., Repair of extensive palatal defects with skin tubes. *Plast. & Reconstr. Surg.* 5: 512, 1950.
10. ROSENTHAL, W., Problems of the surgical treatment of congenital cleft. In Transactions of the II Congress of the International Society of Plastic Surgeons, London 1959, p. 20. E. and S. Livingstone, London., 1960.
11. SCHUCHARDT, K., Modern aspects of technique and indications for the tube pedicle flap. In Transactions of the III Congress of the International Society of Plastic Surgeons, Washington, D. C. 1963, p. 833, Excerpta Medica, Amsterdam, 1964.
12. NEUNER, O., A simple procedure for the closure of a large palatal perforation. *Plast. & Reconstr. Surg.*, 47: 296, 1971.
13. BLACK, P. W., A. G. BEVIN, and P. G. ARNOLD, One-stage palate reconstructions with a free neo-vascularized jejunal graft. *Plast. & Reconstr. Surg.*, 47: 316, 1971.
14. CONLEY, J. J., F. DE AMESTI, and M. K. PIERCE, Use of tongue flaps in head and neck surgery., *Plast. & Reconstr. Surg.*, 41: 745, 1957.
15. KLOOP, C. T. and M. SCHURTER, Reconstruction of palate with tongue flap and repair of tongue. *Cancer* 9: 1/129, 1956.
16. PILHEW, F. R., Tongue flap in oral surgery. *Bol. Soc. Cirug. Buenos Aires*, 48: 442, 1964.
17. PAPAIOANNOU, A. and H. FARR, Reconstruction of the floor of the mouth by a pedicle tongue flap. *Surg. Gynec. & Obst.*, 122: 807, 1966.
18. GEORGIADIS, N. G., R. A. MALADICK, and F. L. THORNE, The nasolabial tunnel flap. *Plast. & Reconstr. Surg.*, 43: 463, 1969.

19. JACKSON, I. T., Use of tongue flaps to resurface lip defects and close palatal fistulae in children. *Plast. & Reconstr. Surg.*, 49: 537, 1972.
20. JACKSON, I. T., Closure of secondary palatal fistulae with intraoral tissue and bone grafting. *Brit. J. Plast. Surg.*, 25: 73, 1972.
21. MASSANGERILL, R., K. PICKERELL, and R. MLADICK, Lingual Flaps: Effect on speech articulation and physiology. *Annals of Otology, Rhinology and Laryngology*, 79: 853, 1970.
22. GOSSEREZ, M., and M. STRICKER, La langue, materiau de choix dans la reparations des pertes de substance labiale. In Transactions of the Fourth International Congress of Plastic Surgeons, p. 551 Excerpta Medica Foundation. Amsterdam 1969.
23. CRAMER, L. M., Anterior Mandibular defects of the oral cavity. In Transactions of the III International Congress of Plastic Surgeons. p. 569, Excerpta Medica Foundation. Amsterdam. 1964.
24. BACKDAHL, M., K. E. NORDIN, and J. O. STROMBECK, Bone grafting to the maxillary defect in cleft lip and palate by the method of Backdahl and Nordin. In Transactions of the III International Congress of Plastic Surgeons. 193, Excerpta Medica Foundation. Amsterdam., 1964.
25. SCHUDART, K., Primary bone graft in clefts of lip, alveolus and palate. In Modern Trend in Plastic Surgery. Edited by Thomas Gibson. Butterworths, London. p. 214, 1966.
26. ONEAL, R. N., Oronasal fistulas. Grabb, W. C., Rosenstein, S. W. and Bzoch, R. (Eds) Cleft lip and Palate, Boston, Little, Brown Company. Pag. 490, 1971.
27. FERNÁNDEZ-VILLORIA, J. M., Tonsilar area reconstruction. *Plas. & Reconstr. Surg.* 40: 220, 1967.
28. HADLEY, R. C. and J. B. JOHNSON, Utilization of the Kirschner wire in Pierre Robin Syndrome. *Plast. & Reconstr. Surg.* 31: 587, 1963.
29. KLEINSCHMIDT, O., Operaciones en las partes blandas y esqueleto de la cara. En Kirschner, M. Tratado de Técnica operatoria General y Especial. *Editorial Labor*. S.A. p. 378. 1948.
30. WALLACE, A. F., Esser's skin flap for closing large palatal fistula. *Brit. J. Plast. Surg.* 19: 322, 1966.