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Case Report

A procedure combining double opposing Z-plasty with buccal flap and skin graft for a cleft palate patient with short palate

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ABSTRACT

Cleft palate patients with a short palate are sometimes encountered and it is difficult to achieve effective primary palatoplasty and good speech in these cases. Our purpose was to establish an effective palatoplasty for a cleft palate patient with Randall type III short palate. Buccal musculomucosal flap on the nasal side and skin graft on the oral side were performed, along with double opposing Z-plasty. Speech improved postoperation. This procedure brought the nasopharyngeal area closer to the normal anatomical state. In terms of disadvantages, the procedure is rather complicated and depends on the engraftment rate.

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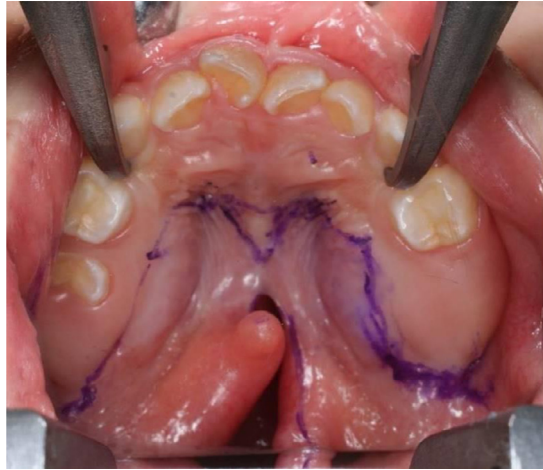


Figure 1. Isolated cleft palate with a quite short palate.

Background

The length of the soft palate in the usual cleft palate might influence speech outcomes after palatoplasty. Cleft palate with a short palate, such as type III or IV as classified by Randall and colleague, is sometimes encountered and good speech outcomes from primary palatoplasty can be difficult to achieve with this pathology.^{1,2}

The pharyngeal flap is a very effective procedure for good speech outcomes but might narrow the nasal cavity, and sometimes causes postoperative sleep apnea.³ Our purpose was to establish an effective palatoplasty not associated with postoperative sleep apnea in a cleft palate patient with a short palate.

Case & Procedure

A 2-year-old boy was noted to have an isolated cleft palate with a short palate, classified as Randall type III (Figure 1, Supplementary figures 1, 2). Speech outcomes on assessment by using the University of Pittsburgh-weighted values for speech symptoms associated with velopharyngeal incompetence were: nasal emission, 5/5; facial grimace, no; hypernasality, 3/4; phonation, NA; and articulation, 6/10.⁴

Double opposing Z-plasty with buccal musculomucosal flap (BMMF) and a skin graft was performed.⁵ Right BMMF (35 mm × 12 mm) was performed for soft palate elongation on the nasal side and the basal portion of BMMF was denuded. A skin graft, taken from the groin, was implanted on the oral-side hard palate, and left in place after pushing back the oral mucosa for soft palate elongation, along with double opposing Z-plasty⁶ (Figures 2, 3, Supplementary figures 1, 2).

Speech improved postoperation: nasal emission, 0/5; facial grimace, no; hypernasality, 1/4; phonation, 0/3; and articulation, 0/10. There was no space present between the posterior pharynx and soft palate during phonation on nasopharyngoscopy (Supplementary video). After nine years postoperation, the skin grafts contracted, but the soft palate had elongated (Figure 4, Supplementary figure 3). As for maxillary growth, edge-to-edge occlusion had been maintained till the patient was 11 years old (Supplementary figure 3).

Discussion

Cleft palate with a short palate, such as Randall type III or IV, is sometimes encountered. In such cases, good speech outcomes can be difficult to achieve from primary palatoplasty.¹ The frequencies

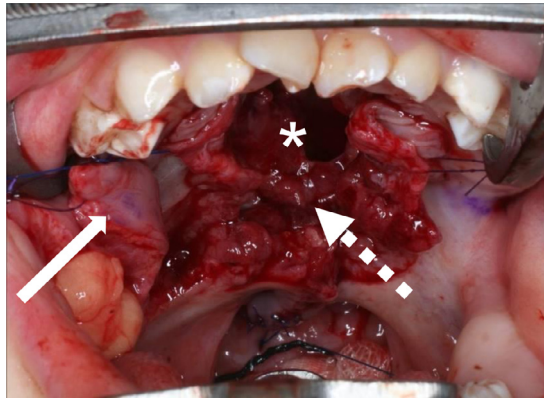


Figure 2. Closure on the nasal side by BMMF. BMMF (white arrow) is positioned into the space created (*) at the back of the soft palate after elongation on the nasal side (white dotted arrow).

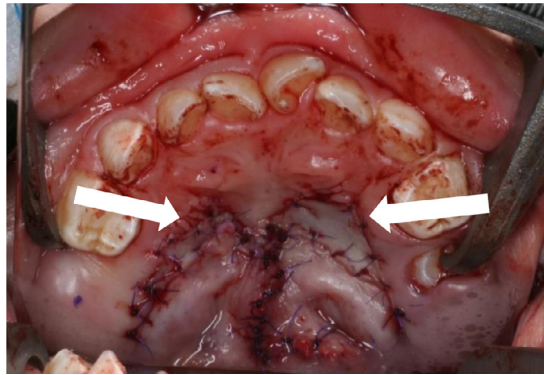


Figure 3. Suture on the oral side. Skin grafts (white arrow) are implanted on the hard palate, along with double opposing Z-plasty.

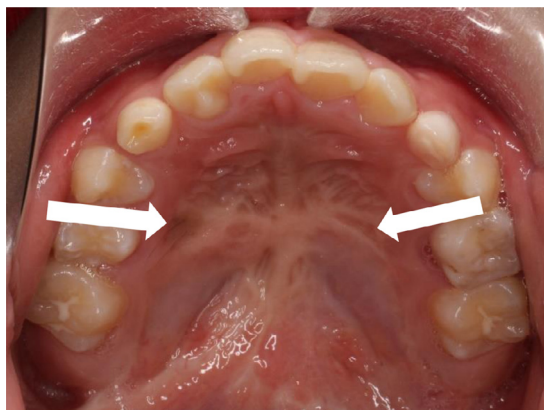


Figure 4. Nine years after the operation. Skin grafts have contracted (white arrow), but the soft palate is elongated.

of these pathologies including Randall types III and IV have been reported as 43.5% and 2.2%, respectively.¹ Treatments for these pathologies need the addition of BMMF tissue to expand the short velum.⁵ However, good results can be difficult to achieve from primary palatoplasty in them with a short palate. An acceptable result for speech outcomes and maxillary growth was obtained by using a procedure combining double opposing Z-plasty with BMMF and skin graft.

One advantage of this combined procedure was the ability to elongate the soft palate and expand the nasopharyngeal area including the soft palate; to be closer to a normal anatomical state without narrowing of the cavity by a pharyngeal flap.⁷ This procedure was thus unlikely to result in postoperative sleep apnea. We prefer a procedure combining unilateral BMMF and skin graft for patients with such a short palate, instead of simultaneous bilateral BMMFs on both oral and nasal sides of the soft palate. This is the reason for the increased need for a second operation in patients with such a short palate. We believe that BMMF on the opposite side should not be applied in the primary palatoplasty, because the BMMF is the only local flap that can easily cover and elongate the nasal side of the soft palate. In other words, we can perform re-elongation of the nasal side of the soft palate if the patient does not show good speech outcomes after the primary palatoplasty.

The disadvantage is the complicated procedure and dependence on the engraftment rate. Shrinkage of the palatal length caused by skin graft contracture might be noticeable when parts or the entirety of the skin graft do not achieve engraftment. In addition, concerns have been raised that full-thickness skin grafts from the groin may grow pubic hair when the patient reaches puberty. We have thus only grafted skin obtained from above the groin. Nevertheless, we believe that the procedure might be accepted only for patients with quite a short palate, classified as Randall type III or IV.

In either case, if everything else fails, options such as pharyngeal flap⁸ or retropharyngeal augmentation by cartilage⁹ and fat¹⁰ can be applied.

Conclusion

A combined procedure of double opposing Z-plasty with buccal flap and skin graft was used to treat a cleft palate patient with Randall type III short palate. The soft palate was elongated, and speech outcomes improved.

Funding

None

Ethical approval

Not required

Declaration of Competing Interest

None declared

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.jpra.2021.04.005](https://doi.org/10.1016/j.jpra.2021.04.005).

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