

Trauma-Induced Unilateral Buccal Nonocclusion

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Abstract

Buccal nonocclusion is a difficult situation for orthognathic surgeons. This is the severest form of crossbite with congenital or traumatic origin. Unilateral cases are more difficult and need more attention. Posttrauma-acquired buccal nonocclusion is easier for management than congenital cases that need orthodontic preparation and more complicated orthognathic surgeries. Two cases of trauma-induced unilateral buccal nonocclusion are presented with different etiologies. Preoperative model surgery and posterior segmental surgery are keys to correct trauma-induced buccal nonocclusion.

Keywords: Buccal nonocclusion, oroantral fistula, orthognathic surgery

INTRODUCTION

Buccal nonocclusion is defined as maxillary teeth not occluding with mandibular teeth and overlapping buccal to the mandibular arch.^[1] This problem has two different etiologies: congenital or traumatic.^[2] In trauma patients, this event often is related to fracture of one jaw, so correction should focus on it; however, in orthognathic patients, this results from combination of upper jaw widening and lower jaw narrowing.^[3,4]

Trauma-induced unilateral buccal nonocclusion is often seen in patients with delayed treatment because of intensive care unit stay or priority of treatment for more important injuries.

In this article, two cases reported with different etiologies and treatments are discussed.

CASE SERIES

Case 1

The patient was an 18-year-old man with a large palatal fistula and widened maxilla and lost anterior segment of the maxilla from gunshot with intact mandible. He was treated unsuccessfully with miniplate fixation of fractures in wrong position and had trauma-induced buccal nonocclusion. Casts were mounted in articulator, and model

surgery was done to narrow the maxilla to appropriate occlusion.

Maxillary posterior segmental surgery was done by Kufner technique, and posterior segment was positioned in predetermined occlusion. Palatal fistula was reduced significantly by this maneuver, and bone graft was used in the anterior maxilla to restore the arch continuity. This was then covered by a superiorly based facial artery myomucosal flap. This flap was divided 3 weeks later [Figures 1-4].

Case 2

The patient was a 20-year-old man who was referred one and a half years after a motor vehicle accident for treatment of old bilateral body of the mandibular fracture with resultant anterior open bite and a class III malocclusion.

An interview with the patient revealed that the class III malocclusion had been present even before the jaw fracture, but the open bite and left buccal nonocclusion were new.

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Figure 1: Large palatal fistula and maxillary widening



Figure 2: Buccal nonocclusion

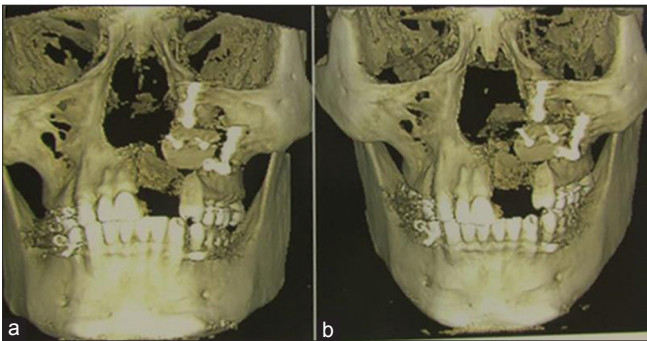


Figure 3: (a) Posterior maxillary segmental surgery. (b) anterior maxillary bone grafting



Figure 4: Results after division of facial artery myomucosal flap

Model surgery with treatment plan of bilateral body osteotomy and removal of mandibular left second premolar was performed. This resulted in establishment of appropriate occlusion. A sagittal split osteotomy was performed on the left side for two purposes: one for correcting the jaw relation and the second for identifying the inferior alveolar nerve. The second premolar was removed, and straight body osteotomy with nerve lateralization was done on the right side. Step body osteotomy with preservation of the inferior alveolar nerve was performed on the right side.

Mandibular posterior segmental surgery was done to widen the mandible and correct the trauma-induced buccal nonocclusion. Once in appropriate dental occlusion, the segments were fixed with miniplates and position screws [Figures 5-9]. Nerve sensation in the lower jaw returned to normal in 3 months.

DISCUSSION

Management and surgical correction of trauma-induced buccal nonocclusion is not easy. Appropriate model surgery is the key for success.^[5] Narrowing the maxilla in the case of maxillary fractures and widening the mandible in mandibular fractures are solutions for this problem.^[6] A congenital unilateral buccal nonocclusion often needs surgery in both jaws to correct the

deformity, but trauma-induced buccal nonocclusion is often corrected by posterior-segmented surgery in the fractured jaw.

Transmaxillary wire to stabilize the maxilla after narrowing is mandatory for preserving the corrected jaw relation.

Posterior mandibular segmental surgery to widen the mandible is technique sensitive. Posterior bony cuts are similar to sagittal osteotomy in increasing the size of the segment to prevent avascular necrosis.^[7] Fixation of this segment is also easy because of more space for internal fixation.^[8] Preserving the inferior alveolar neurovascular bundle is crucial in this surgery not only for lip sensation but also to prevent vascular compromise of the mandible.^[9] In a previously fractured mandible with a fracture line that lies in between the mental and mandibular foramina, the inferior alveolar nerve is often stretched. Great caution should be exercised to preserve the function of the nerve.

CONCLUSION

Posterior segmental surgery is the key to correct trauma-induced buccal nonocclusion.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have



Figure 5: Trauma-induced buccal nonocclusion



Figure 6: Clinical picture



Figure 7: Step body osteotomy in the left side

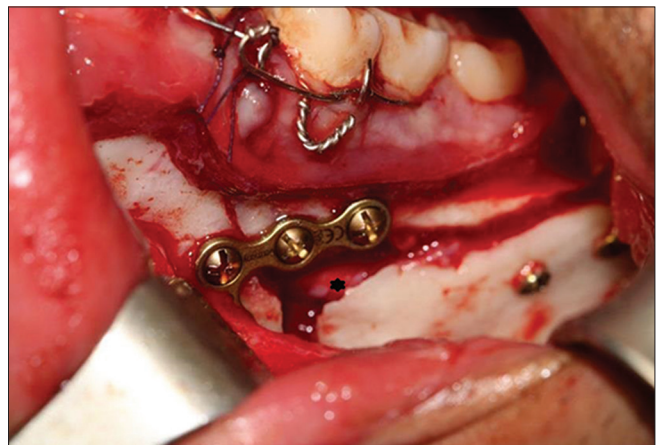


Figure 8: Sagittal ramus osteotomy and posterior segmental surgery, *sign is inferior alveolar neurovascular bundle

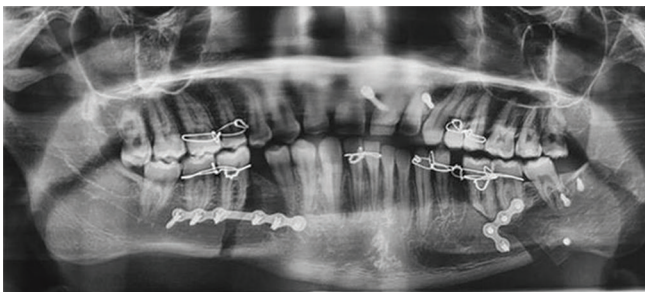


Figure 9: Postoperative x-ray

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Sakamoto T, Hayakawa K, Ishii T, Nojima K, Sueishi K. Bilateral scissor bite treated by rapid mandibular expansion following corticotomy. *Bull Tokyo Dent Coll* 2016;57:269-80.
2. King JW, Wallace JC. Unilateral brodie bite treated with distraction osteogenesis. *Am J Orthod Dentofacial Orthop* 2004;125:500-9.
3. Mori Y, Susami T, Chikazu D, Saijo H, Sakiyama M, Matsuzaki M, *et al*. Unilateral expansion of a narrow mandibular dental arch combined with bimaxillary osteotomies in a patient with hypoglossia. *Int J Oral Maxillofac Surg* 2009;38:689-93.
4. Chugh VK, Sharma VP, Tandon P, Singh GP. Brodie bite with an extracted mandibular first molar in a young adult: A case report. *Am J Orthod Dentofacial Orthop* 2010;137:694-700.
5. Ratna P, Srinivasan B, Devaki Vijayalakshmi R, Ravanth Kumar C. Surgical correction of brodie bite in adults: A novel surgical splint. *J Maxillofac Oral Surg* 2017;16:263-6.
6. Kim KA, Yu JJ, Chen Y, Kim SJ, Kim SH, Nelson G, *et al*. Surgery versus nonsurgery option for scissors bite treatment. *J Craniofac Surg* 2015;26:e726-9.
7. Pangrazio-Kulbersh V, Berger JL, Kaczynski R, Shunock M. Stability of skeletal class II correction with 2 surgical techniques: The sagittal split ramus osteotomy and the total mandibular subapical alveolar osteotomy. *Am J Orthod Dentofacial Orthop* 2001;120:134-43.
8. Pangrazio-Kulbersh V, MacIntosh RB. Total mandibular alveolar osteotomy: An alternate choice to other surgical procedures. *Am J Orthod* 1985;87:319-37.
9. Rahpeyma A, Khajehahmadi S. Inferior alveolar nerve repositioning and orthognathic surgery. *J Craniofac Surg* 2014;25:e435-8.