A Modified Kole's Osteotomy for Correction of Anterior Open Bite and Macrogenia in a Cleft Patient

Manikandhan Ramanathan, BDS, MDS, FDSRCS, FPDRCS^{1,2} Srinivasan H. Rao, BDS, MDS³

¹ Department of Cleft and Craniofacial Surgery, Meenakshi Cleft and Craniofacial Centre

² Department of Oral and Maxillofacial Surgery, Meenakshi Ammal Dental College, Chennai, Tamil Nadu, India

³ Department of Oral and Maxillofacial Surgery, Priyadarshini Dental College & Hospital, Thiruvallur, Tamil Nadu, India

Address for correspondence and reprint requests Srinivasan H. Rao, BDS, MDS, Department of Oral and Maxillofacial Surgery, Priyadarshini Dental College & Hospital, No.1, VGR Nagar, Thiruvallur, Tamil Nadu, 631203, India (e-mail: srini11@hotmail.com).

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Abstract

Keywords

- anterior subapical osteotomy
- orthognathic surgery
- Kole's procedure

We present a modified technique to close anterior open bite as well as to correct anterior and vertical macrogenia without sacrificing the lowermost symphyseal segment, in comparison with conventional Kole's osteotomy, which can alter the symmetric bone architecture of the chin and jeopardize the blood supply of the sandwich segments.

Kole in 1959 published his series on subapical osteotomy for the correction of anterior open bite deformity.¹ This procedure can be used for the correction of localized deformities such as mild to severe open bites and similar major asymmetric segmental deformities.²

A patient who has a cleft with an anterior open bite with class III mandibular incisor relationship may present with prognathic mandible, increased vertical mentum, anterior open bite, and increased chin prominence (► **Figs. 3, 4**). Conventional maxillary advancement osteotomy with posterior impaction or distraction osteogenesis will be the treatment option if maxillary hypoplasia exists along with open bite.

We have developed a technique where anterior open bite and macrogenia can be corrected simultaneously via an intraoral subapical osteotomy. Instead of using a lower chin segment³ as a bone graft for filling the bone lacunae underneath the subapical segment, we used a separate osteotomized bone segment above the symphyseal component as a donor graft.

Surgical Method

The subapical osteotomy cuts were made between the first and second premolar (no extraction) as in diagram (► **Fig. 1**). The subapical osteotomy segment was repositioned superiorly as in standard Kole's technique to correct the open bite. After a low-level genioplasty, a 5-mm wedge of bicortical bone was removed above the level of genioplasty cut as in the picture (► **Fig. 2**). This bone wedge was used to fill the defect below the subapical bone defect (subapical sandwich with vertical and anterior genial correction; ► **Fig. 2**). Because the pogonion had soft tissue excess, an intraoral symmetrical soft tissue excision also was done to improve the chin's soft tissue profile.

This modified technique is done to close anterior open bite as well to correct anterior and vertical macrogenia without sacrificing the lowermost symphyseal segment, in comparison with conventional Kole's osteotomy, which can alter the symmetric bone architecture of the chin and jeopardize the blood supply of the sandwich segments (► **Figs. 5, 6**).

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Figure 1 Diagrammatic presentation of surgical procedure.

Figure 2 Intraoperative view. Arrow shows the sandwich of bone below the subapical segment.

Figure 3 Preoperative profile view.

Figure 4 Preoperative intraoral view.

Figure 6 Postoperative intraoral view.

Conflict of Interest
None.

Figure 5 Postoperative profile view.

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