Genioplasty



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KEYWORDS

• Genioplasty • Chin deformity • Genioplasty technique

KEY POINTS

- Genioplasty procedures are mostly performed as part of the orthognathic surgical correction of dentofacial deformities.
- The clinical and radiographic assessment of the chin should, therefore, form part of the overall orthognathic assessment of patients.
- Genioplasty is not a substitute for mandibular surgery to place the mandible in the correct sagittal position.
- The shape of the chin is just as important as its position.
- The surgical technique of the 3-dimensional correction of the chin is discussed in a step-by-step fashion with tips and traps for each step.

Introduction

Intuitively, the functional nature of the chin evades us; however, the importance of the chin in completing facial harmony is fundamental. It is, thus, a basic requirement for any physician wishing to practice orthognathic surgery to be well versed in the identification of genial morphology that detracts from facial harmony and the surgical techniques required for its correction.

The identification and classification of morphologic characteristics that detract from facial harmony is most effectively accomplished by clinical examination. It is a skill that is acquired and refined by constant examination of faces; but the clinician may also use cephalometric guidelines to confirm the diagnosis, assist in treatment planning, as well as to develop a surgical prediction of the treatment outcomes.^{1,2} Since its original description by Trauner and Obwegeser,³ the technique has undergone numerous modifications and refinements.^{4–7} As a result several variations exist; however, the technique presented here has served the authors well.

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Surgical technique

Infiltration with vasoconstrictor

The area of dissection is infiltrated with a local anesthetic containing a vasoconstrictor (epinephrine in a concentration of 1:100,000) 10 minutes before surgery.

Mucosal incision

The mucosal incision is placed roughly 5 mm superior to the buccal sulcus in the labial mucosa from canine to canine (Fig. 1).

- Care must be taken to identify the branches of the mental nerve, which are often visible.
- Placement of the incision must provide for a soft tissue cuff of mucosa and muscle to suture and should be placed well away from the attached mucosa of the teeth to prevent gingival recession.

Muscular incision

The incision is then completed down to the bone (see Fig. 1).

• The mental nerve should be avoided where it exits from the mental foramen by not carrying the incision too far posteriorly.

Periosteal stripping

• Stripping of the periosteum should strive to maintain the periosteum intact, and avoid total denudation of the chin as this will result in unpredictable soft tissue changes (see Fig. 1).

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Fig. 1 Placement of reference marks. (1) The incision is placed in the buccal sulcus leaving at least 5 mm of nonkeratinized mucosa superior to the incision. (2) The mental nerve is identified and protected. (3) Reference marks are placed to assist in accurate repositioning of the genial segment.

• At this stage, the mental nerve is identified and protected on both sides.

Placement reference marks

The midline of the chin is marked in the superior segment and continued down onto the genial segment to provide a landmark for accurate repositioning (see Fig. 1).

- If the surgeon wishes further landmarks (usually in cases when correction of chin asymmetry is required), it may be placed bilaterally to the midline.
- At the same time, a hole is drilled into the inferior portion of the midline mark to allow for the future placement of a holding wire.

Performing the horizontal osteotomy

While protecting the mental nerves, the osteotomy is commenced preferably with an oscillating saw (Fig. 2). The design of the osteotomy is influenced by the aesthetic requirements.⁸

Correction of anteroposterior chin deformities

- For only anterior augmentation or reduction of the chin, the osteotomy should be performed in a horizontal plane (Fig. 3). The height of the osteotomy will influence the shape of the mental area and the depth of the labiomental fold (see Fig. 3).
- However, by changing the angulation of the osteotomy, the vertical dimension will be influenced by either sliding the genial segment upwards (when advancing the chin) or downwards (when setting the genial segment back) (Fig. 4).



Fig. 2 (a) The horizontal osteotomy is performed using an oscillating saw. (b) Care should be taken to perform the osteotomy at least 5 mm below the root apex of the canine tooth and the mental foramen. (c) Ensure that the osteotomy is carried through the lower border of the mandible.

Correction of the vertical dimension of the chin

In addition to the change in angulation, the height of the chin can further be controlled by ostectomy of a segment of the genial bone or augmentation by down grafting:

- A. The height of the mental area can be reduced by removal of a preplanned segment of bone from the genial area (Fig. 5).
 - Perform the first osteotomy low enough to facilitate performing the second osteotomy from the superior aspect.
 - The desired osteotomy cuts are partially completed at the chosen height. The inferior portion of the osteotomy is completed before the segment to be removed is mobilized.
 - Complete the lower osteotomy and mobilize the genial segment.
 - Remove the intersegmental bone and place rigid fixation.



Fig. 3 The height of the osteotomy will influence the shape of the chin. (*a*) A high osteotomy will make the labio-mental fold more obtuse (*c*) and shallower. (*b*) A lower osteotomy will augment the tip of the chin (*d*) and increase the depth of the labio-mental fold.

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