

# Mentoplasty for the Treatment of Chin Deformities

**Keywords:** Chin; Deformities chin; Surgery; Facial bones; Surgery

## Abstract

Mentoplasty is a surgical procedure that is indicated for the treatment of chin deformities, in the absence of dental malocclusion. In this article the authors describe in a concise way the patient's evaluation, surgical technique, complications and illustrate with clinical cases.

Genioplasty is a surgical procedure indicated for the treatment of chin deformities. In this article, the authors describe the patient evaluation, surgical technique, complications and clinical cases in a concise manner.

## Introduction

The facial beauty depends on the shape, proportion, position and harmony between its various subunits. Mento occupies a prominent position in the lower third of the face, both in the frontal view and in the facial profile. Surgical access to deformities of the chin began in the second half of the last century, with the development of silicone prostheses. Mento osteotomies have allowed a new approach to deformities, altering chin height and position [1,2].

As in most facial plastic subjects, there are no papers showing evidence of the ideal management of chin deformities.

We used various techniques of augmentation. It is difficult to find isolated prominentism, usually we find prognathism that is associated with maxillo-mandibular deformities. In this text, we discuss the deformities of the chin, and its correction, for patients who have acceptable dental occlusion, but with a deficit in the contour of the chin, and patients with malocclusion corrected concomitantly with mentoplasty.

**The techniques for augmentation are:** Osteotomies (with or without autogenous graft placement) and alloplastic implants. Both have advantages and disadvantages. Implants are technically simpler, easily removable and with a low incidence of complications, while osteotomies are indicated for asymmetries and marked micro generations. Implants can be inserted by intra- (or) extra-oral access, while osteotomies require intraoral access. Intraoral incisions are contaminated, and present the risk of labial incompetence if the mental muscle is not approached correctly. The extraoral incision has the disadvantage of leaving a visible scar.

The alloplastic implant and the sliding osteotomies can be used together to obtain satisfactory results in selected cases [3].

## Facial Analysis

To determine the proper projection of the mentum, we must use a method that is easy to execute, reproducible and that takes into account the aesthetic lines of the face. The simplest method to evaluate the projection of the chin is to draw a line perpendicular to the Frankfurt plane from the fronto-nasal suture (Figure 1). The chin should be in this line or slightly posterior. There are other methods



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of assessing chin projection, but they are more difficult to reproduce, calculate and use clinically. We always have in mind the important references of the mental region: chin-groove sulcus = depression below the lower lip, gnation = lowermost point of the contour of the mentum, pogonion = anterior point of the contour of the mentum, mental = tion (Figure 2). Important angles of the mental region: Nasomental = 120 to 132 degrees, Mentocervical = 80 to 95 degrees, Nasal Frontal = about 120 degrees (Figure 3).

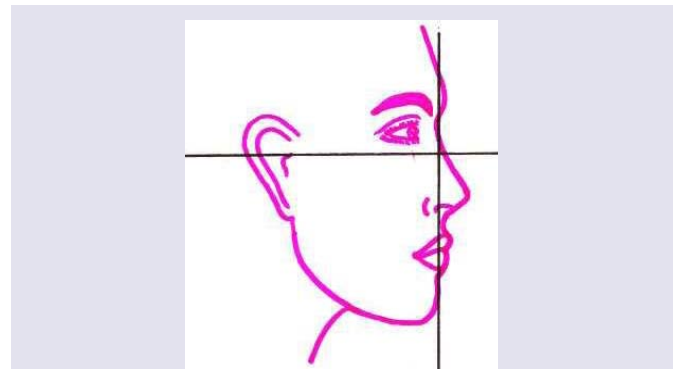


Figure 1: Pogônio/Nasium perpendicular.

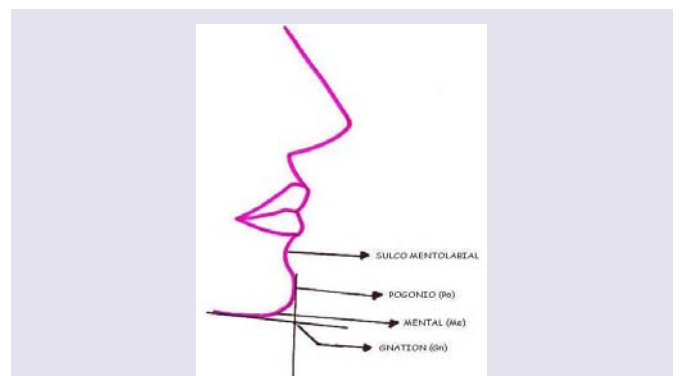
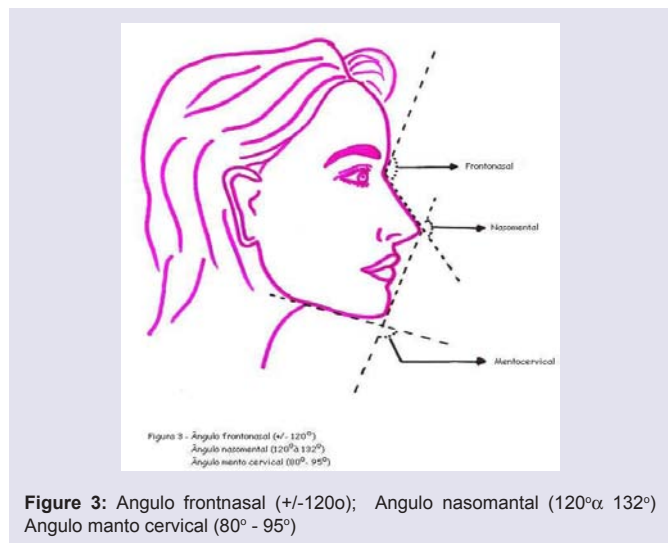


Figure 2: Mental points of reference.



**Figure 3:** Angulo frontnasal (+/-120o); Angulo nasomental (120o a 132o) Angulo manto cervical (80o - 95o)

We must always remember the thickness of the subcutaneous tissue and the musculature of the mental region that will directly interfere with our surgical planning.

### Surgical Technique

#### Mentonian osteotomy

After the clinical and radiological evaluation, we planned the height, the inclination and the extension of the osteotomy of the ment.

In cases of hypomentalism, we calculated the previous slip to an imaginary line perpendicular to the Frankfurt plane, from Nasion. The opposite is applied to macrogen or prominentism.

We make the intra oral incision anterior to the fund of gingival sulcus from canine to canine. The subperiosteal detachment extends to the region of the apices of the first premolars, where we must find the mental nerve that should be visualized and preserved. The periosteum is elevated lower and laterally. The suprahyoid muscles and the lingual periosteum should be kept inserted to maintain the vascularization of the osteotomized bone segment [4].

The osteotomy should be horizontal or inclined and asymmetrical, according to the planning, for this we use a reciprocating saw and perform a vertical mark in the midline for orientation at the time of fixation. The osteotomy should be performed below the dental apices (Figure 4).

Bear in mind that sliding of the osteomized bone segment should be done in the anteroposterior and / or lateral direction.

In order to increase vertical height, and horizontal slides greater than 10 mm from the limb, we used a bone graft inserted to the osteomized fragment (costal graft, cranial caliper, iliac) or performed a double osteotomy with a stepped slip (Figure 5). Autogenous grafts may be bony, cartilaginous or osteocartilaginous.

The grafts have the disadvantage of requiring another surgical time for removal of the grafts, and resorption which may be partial or total due to local pressure and marked mobility of the adjacent soft parts. Fat graft has total resorption.

The height of the lower third of the face, we do removing an intermediate fragment, that is, we make two osteotomies, keeping the lower fragment with its muscular insertions.

The fixation of the mobilized bone segment is made with steel wire number 1 or 2, in at least two points, or with miniplates and titanium screws. We now use H-plate with 2 mm thick screws (Figure 6), or screws applied as Lag Screw (2 screws are advised to avoid fragment rotation) (Figure 7A and 7B).

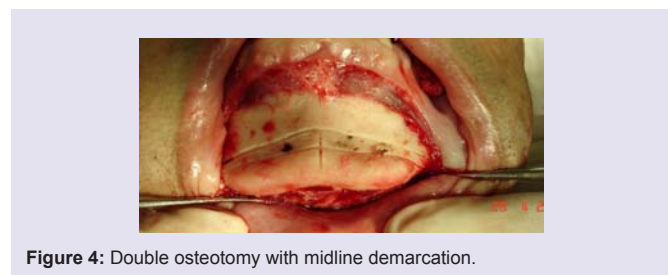
Mentoplasty may be a procedure applied to the treatment of obstructive sleep apnea. In this case we make a technical modification to draw a larger number of fibers of the genioglossus muscle (Figure 8).

The suture is made with absorbable wire (Catgut, Vicryl) numbers 3-0 or 4-0, in two planes of preference, with special attention to the rapprochement of the mental muscle.

The dressing consists of a bandage with porous tape keeping the soft tissues adhering to the lower and anterior border of the ment (Figure 9) [5].

### Alloplastic Implants

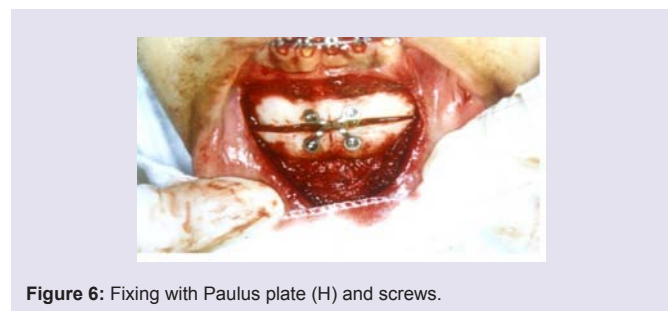
Various materials can be used as a breast implant. The most widely used alloplastic implant in the world is solid silicone, both hard and soft. The most used material by us is porous polyethylene (Porex®), In our series has not yet occurred a major complication that



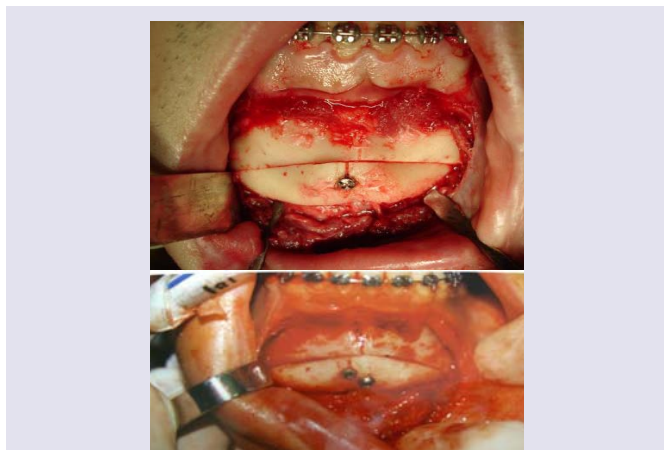
**Figure 4:** Double osteotomy with midline demarcation.



**Figure 5:** Double osteotomy with stepped slip, fixed with Lag Screw.



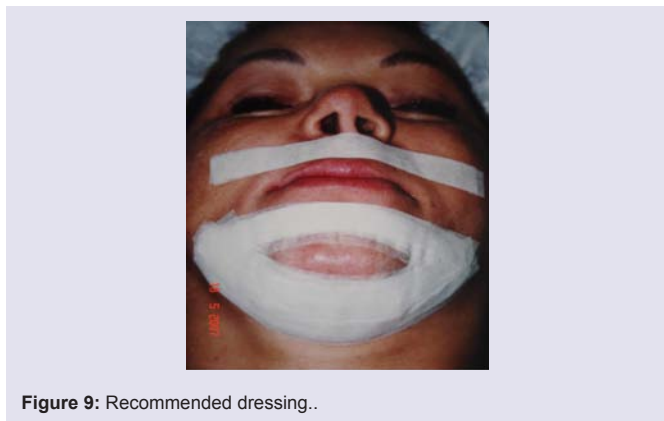
**Figure 6:** Fixing with Paulus plate (H) and screws.



**Figure 7:** A) Screw fastening (Lag Screw), with chin lateralization. B) Two screw fixing (Lag Screw), with chin lateralization.



**Figure 8:** Modified mentoplasty applied to sleep apnea treatment.



**Figure 9:** Recommended dressing..

would justify its removal. The same cannot be said of solid silicone, which has already been removed several times by displacements and bone erosions, including dental mobility of the region.

The great advantage of porous polyethylene is that it allows a more rigid fixation and, therefore, does not mobilize easily or cause bone erosion [6].

The authors recommend the technique of introducing a mental prosthesis through a vertical incision of about one centimeter in diameter at the level of the canines, as the most feasible joining the two incisions, insertion of the recommended graft, suture and dressings (Figure 10A-10D).

## Complications

### Dental injury

The best way to avoid this complication is prevention. Cephalometry in conjunction with the panoramic jaw radiograph provides adequate insight into the position of the dental roots, which should be avoided during osteotomy and drilling for the placement of the screws or steel wire. If the dental apices are damaged, try to preserve them with endodontic treatment.

### Infection

In the case of infection, culture material should be collected and empirical antibiotic therapy initiated promptly. In the case of implants, a sterile inflammatory process is expected around the implant, which resolves in approximately 10 days. The inflammatory process lasting more than 10 days should be considered infectious and treated as such.

### Mentonian nerve injury

Meticulous dissection in the region of the foramen mentoniano usually prevents nerve damage. Some paresthesia is expected postoperatively with spontaneous resolution. Paresthesia lasting more than 6 months should be considered permanent. The use of corticosteroids in this situation is controversial [7,8].

### Displacement of the implant

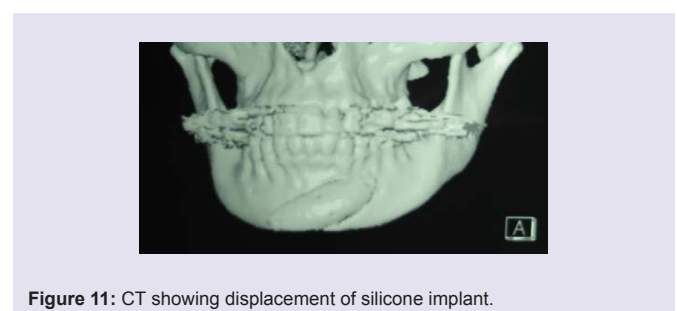
Fastening with screws or steel wire prevents movement (Figure 11).

### Bone Absorption

All alloplastic implants cause bone resorption, with potential to injure the dental roots, in addition to diminishing the projection of the ment.



**Figure 10:** A: Polytetrafluorethylene. B: Solid silicone. C: High Density Porous Polyethylene. D: Incision recommended by the author for placement of alloplastic implants.



**Figure 11:** CT showing displacement of silicone implant.

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