Intraoral Genioplasty—A Newer Technique

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Summary: In this article, we present a new surgical approach to the mandible that can be used for implant placement or osseus genioplasty. This approach is virtually scarless, helps in reducing blood loss due to a subperiosteal dissection, may theoretically reduce the risk of mental nerve damage, and helps reduce postoperative functional recovery time, as the mentalis muscle is never transected, only reflected. (Plast Reconstr Surg Glob Open 2021;9:e3518; doi: 10.1097/GOX.0000000000003518; Published online 8 April 2021.)

INTRODUCTION

The underlying skeletal structure plays an essential role in defining the appearance of the face.1 The chin, therefore, plays a fundamental role in facial harmony.2 Its importance in the overall facial appearance can be appreciated in the presence of a retrognathic mandible, causing other facial areas to appear too large or small.3 Recognition, evaluation, and treatment of chin abnormalities often have a great impact on facial appearance.4

The correction of chin deformities can be performed for aesthetic or functional reasons.5,6 Appropriate treatment of these deformities will improve appearance of the mouth, the lips, and the nose. Chin augmentation can be performed through noninvasive or surgical procedures.1 Injection of soft-tissue fillers or autologous fat are noninvasive procedures that are ideal for modifying chin shape.6 Although not permanent, they have the advantage of not requiring incisions and avoiding surgical scars.7 Surgical augmentation of the chin can be performed with implant placement or with an osteotomy of the bony mentum (osseous genioplasty). The latter, however, remains the gold standard for treatment of chin deformities.1

The intraoral or vestibular approach for the chin osteotomy was first described by Trauner and Obwegeser.7 It allows for safe access to the entire facial surface of the mandibular skeleton. In this standard technique, following the mucosal incision, the mentalis is transected. This muscle must be reapproximated during closure. Failure to do so can result in a ptotic soft-tissue envelope, commonly referred to as “witch’s chin” deformity.8 Even when properly repaired, there is still a formation of dense fibrotic scar tissue, which can lead to incomplete muscle recovery.9 Although the hidden intraoral scar has been considered a great advantage of this technique, overgranulation of the buccal wound may occur.10

The newer intraoral genioplasty presented in this article offers several advantages over the standard approach. It avoids transection of the mentalis, thus preserving its integrity and avoiding any postoperative muscle dysfunction. Additionally, the avoidance of the vestibular scar also results in increased postoperative comfort.

TECHNIQUE

Preoperative Assessment

All patients scheduled for any form of orthognathic surgery undergo cone beam computed tomography for preoperative planning. This allows the surgeon to evaluate the anatomy of the jaw, particularly the position of the mental foramina.

Surgical Intervention

Approach

The procedure is performed under general anesthesia and nasotracheal intubation. The patient is placed on the operating table in the supine position. An estimated 6mL of local anesthetic is injected in the mental region (lidocaine 1% with epinephrine 1:100,000). The surgeon is placed at the head of the patient. A vertical release incision is made on the buccal surface of the second premolar angulating away from the mental nerve directly down to the periosteum. The dental papillae are then released around all the anterior teeth from the second premolar to the second premolar. A vertical release incision is made on the buccal surface of the second premolar angulating away from the mental nerve directly down to the periosteum. The dental papillae are then released around all the anterior teeth from the second premolar to the second premolar. The second vertical release incision

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is made. From the site of the first vertical incision, the subperiosteal plane is identified. Releasing of the papillae is then performed in this plane from the second premolar to the second premolar until both vertical release incisions meet. This is done using a periosteal elevator staying under the mentalis and reflecting to the inferior border of the mandible. Both mental nerves are identified and freed from surrounding tissue not to create pressure or pulling. The mandible is now widely exposed whether it be for removal of an intraosseous tumor, implant placement, or for osseous genioplasty. (See Video 1 [online], which displays incisions, approach, and exposure for the newer intraoral genioplasty.)

Closure

Once the procedure is complete, if significant volume was added to the chin, scoring to release the periosteum at the depth of the flap may be required. Meticulous closure is then achieved by placing the papillae in their original position using 3-0 chromic sutures with a small cutting needle. Vertical mattress sutures in each papilla will secure the position and prevent skewing of the papilla to one side or the other. Closure is completed by placing interrupted 3-0 chromic sutures in the 2 vertical release incisions (Fig. 1). (See Video 2 [online], which displays the closure technique with realignment of dental papillae using vertical mattress sutures.)

DISCUSSION

The presented approach to the mandible has several notable advantages. These include: (1) no surgical scar in vestibule or submental region, (2) reduced blood loss because all reflection of tissues is in a subperiosteal plane, (3) theoretically reducing the risk of damage to mental nerves because they are approached and visualized from above, and (4) no ptosis of the mentalis as the muscle is never transected, only reflected.

Several complications of the traditional vestibular approach for the osseous genioplasty have been described. These include unsatisfactory scar at the incision line, lower lip incompetence, retraction, and chin ptosis due to muscle dysfunction. Nadjmi et al described a minimally invasive genioplasty where they approached the mandible with a vertical incision through the lower lip frenulum. Similar to our approach, their technique also avoids transection of the mentalis and the resulting postoperative risk of ptosis. However, a scar is still present on the mucosal surface of the lower lip. The use of the newer intraoral approach to the mandible virtually avoids all scars, whether it would be intraoral or external (Fig. 2).

While the presented approach has been primarily used for the osseous genioplasty, it has also been modified by the primary author for access to the mandibular ramus. An incision along the external oblique ridge of the mandible down to the periosteum is angulated toward the retromolar

Fig. 1. Closure of the dental papillae with vertical mattress sutures in the immediate postoperative period.

Fig. 2. View of the virtually scarless approach 4-months postoperatively.
pad. The incision is continued through the retromolar pad to the distal portion of the second molar. Releasing of the papillae from the second molar to the second premolar is then performed in the subperiosteal plane. Wide exposure of the mandibular ramus is achieved. A vertical release incision may be added if increased access is required.

The primary author has utilized this approach since the early ’90s in over 200 patients. Results have been promising and have shown good postoperative recuperation and excellent mentalis function. There have been no incidences of postoperative dehiscence and great overall patient satisfaction (Fig. 3). The only noted disadvantages have been (1) increased time required for the approach and closure, (2) the surgeon’s experience in meticulous closure, and (3) possible gingival recession. Although the vestibular approach is easy and convenient, with very few adverse effects, this approach will leave no scar in the vestibule and an intact mentalis muscle.

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REFERENCES
1. Sykes JM, Fitzgerald R. Choosing the best procedure to augment the chin: is anything better than an implant? Facial Plast Surg. 2016;32:507–512.
2. Ramieri V, Maffia F, Vellone V, et al. The pyramid chin augmentation: a new technique. J Craniofac Surg. 2020;31:662-663.
3. Thayer ZM, Dobson SD. Geographic variation in chin shape challenges the universal facial attractiveness hypothesis. PLoS One. 2013;8:e60681.
4. Nadjimi N, Van Roy S, Van de Casteele E. Minimally invasive genioplasty procedure. Plast Reconstr Surg Glob Open. 2017;5:e1575.
5. Song SA, Chang ET, Certal V, et al. Genial tubercle advancement and genioplasty for obstructive sleep apnea: a systematic review and meta-analysis. Laryngoscope. 2017;127:984-992.
6. Rho NK, Chang YY, Chao YY, et al. Consensus recommendations for optimal augmentation of the Asian face with hyaluronic acid and calcium hydroxyapatite fillers. Plast Reconstr Surg. 2015;136:940–956.
7. Trauner R, Obwegeser H. The surgical correction of mandibular prognathism and retrognathia with consideration of genioplasty. II. Operating methods for microgenia and distocclusion. Oral Surg Oral Med Oral Pathol. 1957;10:899–909.
8. Neligan PC. Plastic Surgery. 3rd ed. Canada: Elsevier Saunders; 2013.
9. de Souza J, Gottfried C. Muscle injury: review of experimental models. J Electromyogr Kinesiol. 2013;23:1253–1260.
10. White JR, Dufresne CR. Management and avoidance of complications in chin augmentation. Aesthet Surg J. 2011;31:534–642.
11. Jones BM, Vesely MJ. Osseous genioplasty in facial aesthetic surgery—a personal perspective reviewing 54 patients. J Plast Reconstr Aesthet Surg. 2006;59:1177–1187.