

Augmentation mentoplasty with osteocartilaginous nasal graft

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ABSTRACT

OBJECTIVE: Augmentation mentoplasty is a common procedure, applied especially in conjunction with rhinoplasty. Although various materials have been used, autogenous nasal hump tissue has not been studied in a big series of patients. The main objective of this study was to evaluate the use of autogenous nasal hump in chin augmentation.

STUDY DESIGN: Case series with chart review.

SETTING: University hospital.

SUBJECTS AND METHODS: The osteocartilaginous mentoplasty procedure was performed in 124 patients along with rhinoplasty in a series of 218 patients who had undergone combined rhinoplasty and mentoplasty with various techniques. The median follow-up was 58 months (range, 12–120 months) over a 10-year period. The procedure commenced under general anesthesia for all patients with large humps and poor chin projection. During the rhinoplasty procedure, the osteocartilaginous nasal hump was removed, tailored to achieve an anatomic mental form, and inserted into the mental pocket through a submental or an intraoral incision.

RESULTS: Infection was detected in five patients, two of whom required graft removal. All other patients recovered normally along an almost painless process, without displacements or any other complaints.

CONCLUSION: Nasal hump in reduction rhinoplasty is a useful alternative for augmentation mentoplasty on patients with large humps and poor chin projection. It also avoids all the disadvantages of alloplastic materials and eases integration compared with other alternatives in selected cases.

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Aesthetic facial balance as an objective determination of beauty was appreciated centuries ago by the greatest of scientists and artists. Surgical methods of restoring balance to the face are legion, and techniques for augmenting the disproportionately underprojecting mandible (microgenia) are many.

Mentoplasty is often a complimentary procedure to rhinoplasty.¹ Patients seeking care from rhinoplastic surgeons

for nasal corrective procedures can benefit from chin augmentation, yielding a more balanced appearance and enhancing the final result of the rhinoplasty.² At least 25 percent of all rhinoplasty patients may need a chin implant.³ Different kinds of procedures are used to augment the chin, such as the alloplastic implants, the osteotomies, and the use of the autologous grafts.

To our knowledge, this study, by including 124 cases, is the largest so far using osteocartilaginous nasal graft for mentoplasty. The aim of our study was to evaluate the use and summarize the rationale of osteocartilaginous nasal graft in chin augmentation and to discuss the advantages and disadvantages of the technique on patients with large humps and poor chin projection.

Methods

Study Design

We retrospectively reviewed 124 white patients aged 19 to 42 years (mean age 27 years) with large humps and poor chin projection who had undergone mentoplasty combined with rhinoplasty. The study protocol was approved by the Eskisehir clinical research ethical committee. Ninety-four patients who requested mentoplasty by itself and were managed with hydroxyapatite (39 of 94), MEDPOR (Porex Surgical, Newnan, GA) (30 of 94), Mersilene mesh (Ethicon Inc., Somerville, NJ) (17 of 94), and GORE-TEX (W.L. Gore and Associates, Flagstaff, AZ) (8 of 94) were excluded from the study. The 124 patients included in this study had more than 12 months' postoperative follow-up, with an average of 36 months; the longest was 120 months.

Surgical Technique

The procedure commenced under general anesthesia for all patients in our series. All procedures were performed by the senior author (C.C.). The osteocartilaginous nasal hump was removed, and its mucoperiosteum and mucoperichondrium were meticulously removed (Fig 1). Then, the nasal hump was tailored to achieve a mental form, submerged in antibiotic solution of gentamicin, and inserted into the men-

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Figure 1 Osteocartilaginous nasal hump was meticulously removed.

tal pocket through a submental or an intraoral incision. For the intraoral route, a 2-cm horizontal sublabial mucosal incision was performed in the lower fornix at least 6 mm distal to the labiogingival junction, preserving a wide mucosal part for closure (Fig 2A). Then this canine-to-canine incision was carried down to the periosteum. During the submental route, a 2- to 3-cm incision was performed in the submental crease. A pocket extending horizontally and symmetrically on both sides was constituted. The pocket in both routes was supraperiosteal on both sides but subperiosteal at the middle. A piece of periosteum should be left at the middle one third of the pocket for immobilizing the graft (Fig 2B). No systemic antibiotics were used, and no external bandage was applied to the patients after surgery (Fig 3).

Results

This procedure was performed in 124 patients along with rhinoplasty of 218 patients who had undergone mentoplasty, with a median follow-up of 58 months (range 12-120 months) over a 10-year period. We had satisfactory aesthetic results in most patients. Infection was detected in five (4%) patients, two (1.6%) of whom required graft removal, in our series. All other patients recovered normally along an almost painless process, without early seroma formation, displacements, or any other complaints.

Discussion

Many patients with a retruded chin who desire rhinoplasty are unaware of their facial imbalances and deformities. Approximately 25 percent of patients requesting rhinoplasty can also benefit from augmentation mentoplasty.³ Surgical articles delineating a means for micrognathia management first appeared in the early 20th century. Numerous materials found their way surgically into the chin, and modern surgeons continue to use techniques or modifications of methods described long before. Controversy surrounds

the technique of chin augmentation (osseous genioplasty vs allograft augmentation),⁴ route of insertion of the implant (extraoral vs intraoral),^{5,6} method of pocket formation (supraperiosteal vs subperiosteal),⁷ method of implant fixation (limited pocket vs all others),^{4,5} and the possibility and cause of mandibular resorption.^{8,9}

Different kinds of procedures are used to augment the chin, such as the alloplastic implants, the osteotomies, and the use of costal bone or nasal cartilage grafts. Alloplastic materials used in chin augmentation are silicone, hydroxyapatite, Mersilene mesh, porous polyethylene, polyamide mesh, acrylic, Silastic (Dow Corning, Midland, MI), and polytetrafluoroethylene.¹⁰ Alloplastic materials have been widely used despite the many problems described, such as bone erosion, abnormal movement of the mental musculature, infection, and extrusions.^{11,12} Although frequently used, osteotomy is a more complex surgical procedure and requires a well-trained surgeon with some degree of experience.¹³ Autologous grafts include the costal bone,¹⁴ the

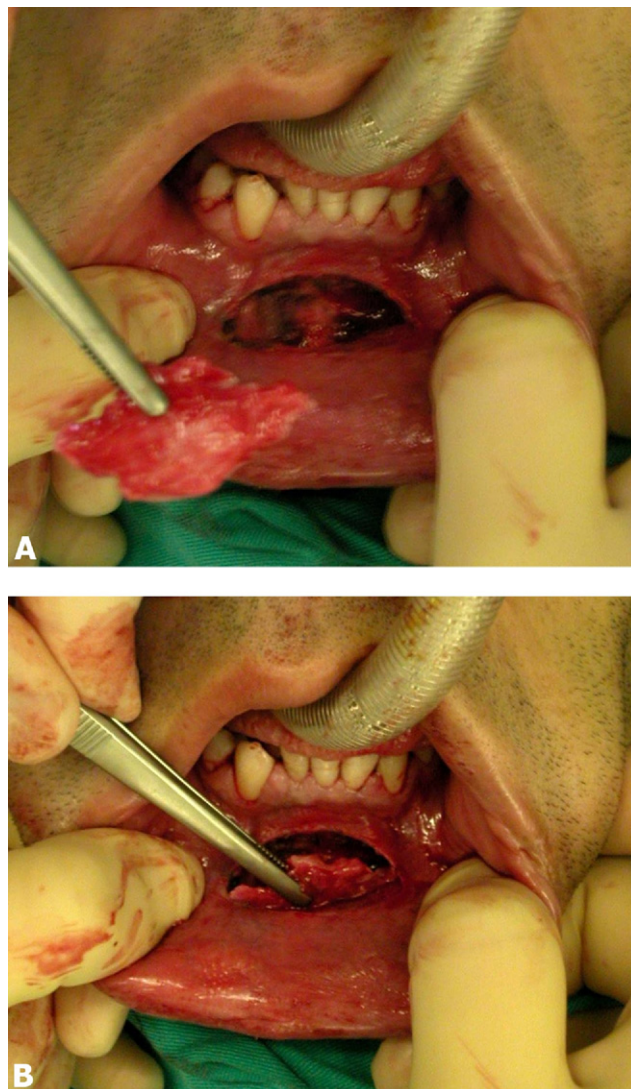


Figure 2 Through the intraoral route, a pocket is prepared subperiosteally (A), and the graft is inserted (B).



Figure 3 Preoperative (A) and postoperative (B) right lateral view.

dental elements,¹⁵ dermal-fat grafts,¹⁶ and stored cartilage.¹⁷ The costal bone graft requires a supplementary operation and leaves an additional scar at the donor site.¹⁸ The use of the nasal hump and septal cartilage was described by Aufricht in 1934 and in 1958.^{19,20} In the latter article, he reported 700 supraperiosteally placed autologous grafts with good clinical results. In a recent article concerning the use of nasal cartilage for chin augmentation, Karacaoglan et al described the use of diced nasal cartilage wrapped in one layer of Surgicel (Ethicon Inc.) that was placed supraperiosteally, through an intraoral approach, to enhance the nutrition of the grafts.²¹ Mottura placed nasal osteocartilaginous graft subperiosteally and reported a total of 36 cases, 10 of which were reviewed after three to eight years of implantation.²² All grafts were stable without any need of revision. In our series, we preferred osteocartilaginous nasal graft for augmentation mentoplasty on patients with large humps and poor chin projection. In other patients with smaller noses, we used alloplastic materials.

Resorption is a potential problem with all biological grafts.²³ The augmentation material could possess a high resorption rate or a high infection incidence, depending on the vascular pattern of the recipient site. Aufricht described no clinical or radiologic resorption as supported by plain roentgenography, although the X-ray films at that time were perhaps not precise enough to enable an adequate control.²⁰ Karacaoglan et al placed diced cartilages supraperiosteally and, with magnetic resonance imaging, determined that 75 percent of the diced grafts were still present after six months, but no long-term result was mentioned.²¹ Mottura's grafts, subperiosteally placed and controlled after 3 to 8 years by three-dimensional computed tomography, did not reveal any resorption.²² Also, the author observed an osteointegration with the mandibular bone in his series. Viterbo placed conchal cartilage subperiosteally and also did not mention resorption in his 28 patients.²⁴ We preferred to place the graft supraperiosteally on both sides but subperi-

osteally at the middle. If the graft were placed totally on the periosteum, it would repose on the muscle, which is the possible cause of muscular distortion or mobility of the implants as reported by Zide et al.²⁵ A piece of periosteum should be left at the middle one third of the pocket, maintaining no possibility of extrusion or distortion of the mental muscles.

McCollough et al reported 277 augmentation mentoplasties using Mersilene mesh performed over a 10-year period and stated an infection rate of 2.5 percent and graft removal of 1.7 percent.⁶ Gross et al, using Mersilene mesh, reported 264 patients operated on in a period of 14 years and observed infection in two (0.8%) and displacement in four (1.5%) cases.²⁶ Infection was detected in four percent (5 of 124) of procedures in our series and managed successfully with intravenous antibiotic therapy. Graft removal secondary to infection was detected in 1.6 percent (2 of 124) of procedures and revision surgery was performed. The literature and practical experience revealed that the major postoperative augmentation mentoplasty complications focused on implant position.⁴⁻¹⁰ Implants placed via an oral approach had a tendency to migrate superiorly, and those placed submentally could drift inferiorly.⁵ In our series, a limited pocket dissection worked reasonably well to stabilize most implants centrally and no displacement was observed. All other patients recovered normally along an almost painless process, without any other complaints. The potential risk of bone erosion, graft migration, and graft necrosis must be kept in mind, but were not observed in our patients. Although complications of this technique have been described as negligible, the surgeon must be aware of possible long-term side effects and should meticulously remove all adherent nasal mucosa from the graft prior to implantation. Epithelium-like cells that have been incompletely removed from the resected nasal hump may result in intraosseous mucocele.^{27,28}



Figure 4 Preoperative (A) and postoperative (B) right lateral view.



Figure 5 Preoperative (A) and postoperative (B) right lateral view.

The procedure presented here constitutes a useful option for chin augmentation involving autologous material. It eases integration compared with other alternatives, and it minimizes the displacement risks of the implant. Another important point is its ease of acquisition and price advantages when compared with silicone or other alloplastic materials. When associated with rhinoplasties, the procedure has a good outcome (Figs 4 and 5). The main disadvantage of the technique is the possibility of the procedure being only concomitant with reduction rhinoplasty. Besides, the utility of the procedure in the present era of limited reduction rhinoplasty limits its use. The possible insufficiency of the nasal hump for an adequate chin augmentation should be kept in mind, and alloplastic materials or osteotomies should be preferred instead for these patients.

Conclusion

Mentoplasty is an important adjunctive surgical procedure for the correction of profile imbalance and facial disharmonies. Although it is a century-old procedure that has undergone many modifications over the years, we are still discovering the many advantages and disadvantages of a great variety of techniques. We herein revisited osteocartilaginous mentoplasty procedure, which maintains the natural contours of the chin.

This intrinsically safe technique is a very good alternative for patients with some form of microgenia, or when patients and surgeons are not likely to use alloplastic implants. It is relatively simple and reproducible in the hands of other surgeons.

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Author Contributions

Cemal Cingi, designed the study, obtained the data, analyzed and interpreted the data, revised the article, and approved the final version to be published; **Murat Songu**, analyzed and interpreted the data, drafted and revised the article, and approved the final version to be published; **J. Regan Thomas**, analyzed and interpreted the data, drafted and revised the article, and approved the final version to be published.

Disclosures

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