The need for mentoplasty following rhinoplasty

F. E. Ozkurt, M. Akdag, E. Yorgancilar and M. Yildirim Baylan
Dicle University Medical Faculty. Department of Otorhinolaryngology. Diyarbakir/Turkey

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Abstract. The need for mentoplasty following rhinoplasty. Objective: Rhinoplasty is the most common facial plastic surgery procedure. The appearance of the face must be considered as a whole to achieve the best results, but assessment of the chin is often overlooked. The aim of this paper was to determine the need for mentoplasty after rhinoplasty. Methods: Adobe Photoshop CS6 (Adobe Systems, San Jose, CA) was used to analyze 200 consecutive rhinoplasty patients, 170 of whom were included in this study. We used Silver and Agarwal’s method for assessment of the chin. Results: A total of 170 profile photographs were analyzed. Of these patients, 58.2% (n=99) had normal chins, 40% (n=68) had small chins (microgenia), and 1.8% (n=3) had over-projection. There were no statistically significant differences between men and women. Conclusion: Chin projection is an important component of facial euphony. Approximately half of the rhinoplasty patients we assessed would also benefit from mentoplasty. Surgeons that perform rhinoplasty should discuss mentoplasty with their patients to achieve the best results.

Introduction

Beauty standards are subjective, changing over time and differing according to ethnicity, gender, and personal preference. Facial beauty depends on the form, proportion, and position of the features. Importantly, the face is used to express emotions. Leonardo da Vinci’s drawings in the 15th century divided the face into horizontal thirds and vertical fifths. The nose is the most prominent element of the middle third of the face, while the chin is the most prominent element of the lower third of the face. Rhinoplasty is the most common procedure in facial plastic surgery. Mentoplasty, a procedure that shapes the chin, is often overlooked, even though the chin position can influence the postoperative profile. Chin and nose symmetry is very important, because a disproportionate chin may exaggerate the nose size. Preoperative planning is key for obtaining good results.

There are several methods of analyzing the chin, including cephalometric and photogrammetric methods. Here we used Silver and Agarwal’s method. The aim of this study was to determine how many patients that underwent rhinoplasty would also benefit from mentoplasty. We further determined the incidence of microgenia in patients who underwent rhinoplasty.

Materials and methods

Preoperative digital profile photographs of 200 consecutive rhinoplasty patients were analyzed. Patients were included in the study if the photograph showed a side profile with the patient’s lips closed tightly so that the ear canal, chin, and glabella were visible. Adobe Photoshop CS6 (Adobe Systems, San Jose, CA) was used to analyze the photographs, and statistical analyses was performed with SPSS version 14 (SPSS Inc., Chicago, IL). For our study, 170 photographs fit the criteria and were evaluated using Silver and Agarwal’s method. In this method, a perpendicular line is drawn from the superior meatus of the ear canal through the inferior orbital rim to the Frankfort horizontal line. The perpendicular line should pass through the lower lip vermilion-cutaneous junction. The chin should connect this line in men and fall 1.0- to 2.0-mm behind the line in women (Figure 1).

All patients provided informed written consent for use of their photographs for educational and research purposes.

Financial support: Dicle University DUBAP provided financial support for English language editing. The study results have not been presented previously at any meeting.
method. However, other methods are also used, such as Merrifield’s Z angle method; Legan’s method; Burstone’s method; Ricketts’ method; and Steiner’s method.

In the Gonzalez Ulloa method, the chin should lie at or just behind the line that is perpendicular to the Frankfort horizontal line that passes through the nasion (Figure 2).

Results

The study included 80 men and 90 women. A total of 58.2% (n = 99) had normal chins, while 40% (n = 68) had small chins (microgenia) and 1.8% (n = 3) had over-projections. In men, 57.5% (n = 46) had normal chins, 38.8% (n = 31) had microgenia, and 3.7% (n = 3) had over-projection. In women, 58.9% (n = 53) had normal chins, 41.1% (n = 37) had microgenia, and none had over-projection. There was no difference between men and women in terms of requiring rhinoplasty (p = 0.911). When we quantified the degree of microgenia, we found that in men, 58% (n = 18) had 0- to 3-mm microgenia, 29% (n = 9) had 3- to 6-mm microgenia, and 13% (n = 4) had microgenia > 6 mm. In women, 75.6% (n = 28) had 0- to 3-mm microgenia, 24.4% (n = 9) had 3- to 6-mm microgenia, and none had microgenia > 6 mm.

Discussion

Along with the nose, the chin has a large impact on the appearance of the face. Several methods had been defined for analyzing the soft tissue of the chin. The approaches used most often are Silver and Agarwal’s method; and the Gonzales Ulloa method. However, other methods are also used, such as Merrifield’s Z angle method; Legan’s method; Burstone’s method; Ricketts’ method; and Steiner’s method.

In the Gonzalez Ulloa method, the chin should lie at or just behind the line that is perpendicular to the Frankfort horizontal line that passes through the nasion (Figure 2). In Merrifield’s Z angle method, the Z angle, which is formed by the line tangent to the pogonion and anterior upper lip and the Frankfort horizontal line, should be between 75 and 85 degrees (Figure 3). In Legan’s method, the angle of facial convexity should be between 8 and 12 degrees. This angle is formed by intersecting lines that pass through the glabella and subnasale as well as the line connecting the subnasale to the pogonion (Figure 4). In Burstone’s method, the point of focus is the line that intersects the subnasale and the pogonion (Figure 5). The anterior part of the upper lip should be 4.5 mm in front of this line, while the anterior part of the lower lip should be 2.0 mm in front of this line. In Rickett’s method, the point of focus passes through the nasal tip to the pogonion. The anterior part of the upper lip should be 4.0 mm behind the line, and the anterior part of the lower lip should be 2.0 mm behind the line (Figure 6). Finally, in Steiner’s method, a line is
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Even though all of these methods are useful, we prefer the Silver and Agarwal method, which is easy to use and does not require complicated software. The other methods are more complicated as they involve measuring angles and distances as well as changes in the nasal tip, nasion, and subnasale after rhinoplasty is performed. In addition, we and others think that the upper lip is a more reliable reference point.14

There is no data about the prevalence of microgenia in the general population. However, in the rhinoplasty population, the prevalence has been reported as ranging from 15% to 20%.15 Ahmed et al.2 found that 69.6% of rhinoplasty patients also needed mentoplasty. In our study, 40% of rhinoplasty patients would benefit from mentoplasty augmentation. The difference in the two studies may be due to differences in the ethnicity of the study populations. In the study by Ahmed et al.,2 approximately half of the patients were from India. In contrast, Turkey has a unique geographical location in that the population has origins in many different regions. Specifically, the Turkish population has genes from Asiatic Turks, Byzantines, Kurds, and Arabs as well as from people originating in the Balkans, Caucasus, the Middle East, and Iran.16

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Figure 3
The Merrifield’s Z angle method for chin analysis. This angle is formed by the line tangent to the pogonion and anterior upper lip and the Frankfort horizontal line, should be between 75 and 85 degrees.

Figure 4
Legan’s method for chin analysis. The angle of facial convexity should be between 8 and 12 degrees. This angle is formed by intersecting lines that pass through the glabella and subnasale as well as the line connecting the subnasale to the pogonion.

drawn that passes through the columnellar inflection point to the pogonion. As shown in Figure 7, the upper and lower lip should touch this line.

Figure 5
Burstone’s method for chin analysis. The point of focus is the line that intersects the subnasale and the pogonion. The anterior part of the upper lip should be 4.5 mm in front of this line, while the anterior part of the lower lip should be 2.0 mm in front of this line.
Alloplastic or autologous implant insertion or osteotomies can be performed for chin augmentation. Osseous genioplasty should be performed for conditions in which implants are not appropriate, such as for short chins, long chins, and laterogenia. Alloplastic chin augmentation corrects mild to moderate retrognathia. Chin implants are relatively easy to insert and do not require special equipment. Materials such as acrylic, Silastic (solid silicone; Michigan Medical Corporation, Santa Barbara, CA), Medpor (porous polyethylene; Porex Surgical Inc., College Park, GA), Supramid (polyamide nylon mesh; Ethicon, Sommerville, NJ), and Gore-Tex (polytetrafluoroethylene [ePTFE]; W. L. Gore & Associates Inc., Flagstaff, AZ) are all used in implants. Alloplastic materials offer some advantages: they are simple, they eliminate donor site morbidity, and there is no resorption of the graft material.

Complications that can arise from mentoplasty procedures include soft tissue, nerve, muscle, bone, or tooth problems, and in some cases there are technical issues. Potential soft tissue problems include hematoma development, scarring, granulation, wound dehiscence, cellulitis, early/late abscess, fistula, capsular contracture, and skin necrosis. Possible nerve problems are hypoesthesia/dysesthesia. Potential muscle problems include chin ptosis, mentalis muscle dysfunction, and lower lip retraction. In terms of bone/tooth problems, tooth root damage and mandibular bone resorption may occur. The possible technical problems are implant malposition, underaugmentation/overaugmentation. However, these complications are very rare. Approximately 11,000 mentoplasty procedures have been performed by over 90 surgeons using solid silicon rubber, Mersilene mesh, Proplast (polytetrafluoroethylene; Promotus, Nyon, Switzerland), and Supramid (polyamide; S. Jackson, Inc., Alexandria, VA). In these surgeries, the infection and extrusion rates were 1.7% and 0.3%, respectively. In the study by Guyuron and Raszewska; alloplastic implants were contraindicated in patients with a number of medical problems, including cardiac valvular disease, diabetes, and severe periodontal disease. When an infection is discovered, it should be treated conservatively. If there is no sign of infection regression, the implant should be removed.

In our previous practice, we did not discuss mentoplasty procedures with rhinoplasty patients, but such a discussion might have improved our patient satisfaction rating. Future studies should compare the satisfaction rates of rhinoplasty.
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patients versus patients that undergo both rhinoplasty and mentoplasty. Our findings suggest that surgeons should consider performing mentoplasty along with the rhinoplasty procedure.

Conclusion

Chin projection is an important component of facial euphony, but it is often overlooked. Approximately half of rhinoplasty patients may also benefit from mentoplasty. Alloplastic mentoplasty is a very easy procedure to perform and does not require special equipment. Surgeons that perform rhinoplasty should discuss mentoplasty with their patients to achieve the most satisfactory results.

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References


Fazil Emre Ozkurt
Dicle University Medical Faculty
Department of Otorhinolaryngology
Diyarbakir/Turkey
Tel.: +90 412 280 80 01
Fax: +90 412 248 85 23
E-mail: emre1461@yahoo.com