

Assessing Patient-Reported Outcomes Following Orthognathic Surgery and Osseous Genioplasty

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Abstract: Primary outcomes for orthognathic surgery and genioplasty patients include satisfaction with appearance, improved motor function, and enhanced quality of life. The goal of this study was to assess outcomes among patients undergoing these procedures, and to highlight the potential use of FACE-Q instrument for use in patients with dentofacial deformities. A total of 56 patients presenting for orthognathic surgery and/or osseous genioplasty completed the FACE-Q during preoperative and/or at postoperative visits. FACE-Q scores increased following surgery in satisfaction with facial appearance overall (+24.5, $P < 0.01$), satisfaction with lower face and jawline (+40.7, $P < 0.01$), and in all satisfaction with chin items (*profile, prominence, shape, and overall*). Patients also demonstrated increased social confidence (+8.9, $P = 0.29$). There was no improvement in psychologic well-being (-0.8, $P = 0.92$). All 3 surgical groups of patients experienced gains in satisfaction with appearance following surgery. Patients who underwent orthognathic surgery either alone or in combination with genioplasty demonstrated statistically significant improvements in satisfaction with facial appearance overall ($P < 0.01$ for both groups), whereas patients who underwent genioplasty alone did not ($P = 0.13$). In addition, patients who underwent orthognathic surgery combined with genioplasty demonstrated greater improvement in satisfaction with chin than patients who underwent genioplasty alone. In conclusion, patients who underwent orthognathic surgery and/or genioplasty demonstrated improvement in appearance and social confidence. The use of this model supports the successful outcomes possible for patients undergoing these procedures.

Key Words: Chin surgery, genioplasty, jaw surgery, orthognathic surgery, patient satisfaction, patient-reported outcomes

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Patients undergoing orthognathic surgery usually have a dentofacial deformity secondary to congenital anomalies or trauma that cannot be corrected with orthodontic therapy alone. The goal of surgery, however, is not only to establish normal anatomic and

functional relationships and an ideal dental occlusion, but to optimize facial aesthetics as well. Most lower and midface anomalies are managed with the following procedures depending on the clinical situation encountered: the LeFort I osteotomy, the bilateral sagittal split osteotomy (BSSO) of the mandibular ramus, and the horizontal “sliding” osteotomy of the chin symphysis. Orthognathic surgery is often combined with genioplasty in an attempt to create an aesthetic facial shape, as the chin not only contributes to facial proportion in frontal and lateral views but also supports overlying soft tissues.¹

Improved satisfaction with appearance, motor function, and enhanced quality of life are primary outcomes for orthognathic surgery patients.^{2–4} Therefore, in addition to objective measures of outcome, primary outcomes for assessing success following surgery include appearance and quality of life appraisal.

As the American healthcare system continues to integrate evidence-based practice, reliable information on procedural outcomes must be collected. Historically, the opinions of the healthcare providers have been favored over those of the patients. In the area of orthognathic surgery and genioplasty, which are quality of life procedures, this balance, however, shifts to incorporate the views of the patient.⁵ Therefore, in pursuit of the goal of

TABLE 1. Patient Demographics

N	49
Procedure	
Orthognathic surgery	14 (28.6%)
Genioplasty	17 (34.7%)
Orthognathic surgery combined with genioplasty	18 (36.7%)
FACE-Q Completions	
Preop	35
Postop	30
Mean time from surgery to FACE-Q completion (range, SD) (months)	6.0 (1–30, 6.0)
Orthognathic surgery patients (range, SD) (months)	5.3 (2–12, 3.5)
Genioplasty patients	7.4 (1–30, 8.5)
Orthognathic surgery combined with genioplasty patients	5.4 (1–14, 4.8)
Matching pre- and postop completed (by same patient)	16
Mean time from surgery to FACE-Q completion (range, SD) (months)	5.4 (1–14, 4.4)
Sex	
Female	26 (53.1%)
Male	22 (44.9%)
Missing	1 (2.0%)
Age	
Mean (range, SD) (years)	30.2 (15–51, 13.6)
Missing	3 (6.1%)
Race	
White non-Hispanic	29 (59.2%)
Other	17 (34.7%)
Missing	3 (6.1%)

SD, standard deviation.

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TABLE 2. Pre- Versus Postsurgery Patient Demographics

N	Presurgery	Postsurgery	P-Value
Procedure			
Orthognathic surgery	10 (28.6%)	7 (23.3%)	0.87
Genioplasty	10 (28.6%)	10 (33.3%)	
Orthognathic surgery + genioplasty	15 (42.9%)	13 (43.3%)	
Sex			
Female	20 (57.1%)	16 (53.3%)	0.66
Male	14 (40.0%)	14 (46.7%)	
Missing	1 (2.9%)	–	
Age			
Mean (SD) (years)	31.8 (13.6)	29.7 (14.5)	0.55
Missing	1 (2.9%)	–	
Race			
White non-Hispanic	20 (57.1%)	19 (63.3%)	0.95
Other	12 (34.3%)	11 (36.7%)	
Missing	3 (8.6%)	–	

SD, standard deviation.

*P-value is significant (<0.05).

furthering evidence-based medicine, validated and reliable patient-reported outcome instruments (PROIs), which are questionnaires that measure concepts by asking patients directly, should be used to measure procedural outcomes.^{6,7} There, however, is a lack of

TABLE 3. FACE-Q Scores: Pre- Versus Postsurgery (All Patients)

FACE-Q Scale (Range 0–100)	N	Mean (SE) ^b	Δ	95% CI	P-Value
Satisfaction With Facial Appearance Overall					
Presurgery	32	48.4 (3.2)		41.9–54.8	
Postsurgery	30	72.9 (3.3)	+24.5	66.3–79.6	<0.01*
Satisfaction With Lower Face and Jawline					
Presurgery	18	42.6 (6.3)		29.9–55.4	
Postsurgery	20	83.3 (5.9)	+40.7	71.2–95.4	<0.01*
Social Function (Social Confidence)					
Presurgery	21	61.4 (5.8)		49.6–73.1	
Postsurgery	22	70.3 (5.7)	+8.9	58.8–81.8	0.29
Psychologic Well-Being					
Presurgery	21	74.0 (5.0)		63.9–84.0	
Postsurgery	22	73.2 (4.8)	–0.8	63.4–83.1	0.92
Satisfaction With Chin Item (Range 1–4)^a					
<i>“Chin in Profile”</i>					
Presurgery	23	2.1 (0.2)		1.7–2.5	
Postsurgery	23	3.4 (0.2)	+1.3	3.1–3.8	<0.01*
<i>“Chin Prominence”</i>					
Presurgery	23	2.3 (0.2)		1.9–2.7	
Postsurgery	23	3.4 (0.2)	+1.1	3.0–3.7	<0.01*
<i>“Chin Shape”</i>					
Presurgery	23	2.5 (0.2)		2.0–2.9	
Postsurgery	23	3.3 (0.2)	+0.8	2.8–3.7	0.02*
<i>“Chin Overall”</i>					
Presurgery	23	2.3 (0.2)		1.9–2.7	
Postsurgery	23	3.2 (0.2)	+0.9	2.8–3.6	<0.01*

CI, confidence interval; Δ, difference between the pre- and postmean scores.

^aThe satisfaction with Chin analysis exclude those patients who did not undergo genioplasty (ie, it excludes patients who underwent orthognathic surgery alone); SE, standard error.

^bMean scores were calculated using a mixed linear regression model adjusting for the following covariates: procedure, sex, age, and race.

*P-value is significant (<0.05).

studies that have analyzed patient perceptions of aesthetic and quality of life outcomes following orthognathic surgery and/or genioplasty using procedural specific PROIs, potentially because of a shortage of these tools.⁸ The FACE-Q, a new PROI made up of numerous scales intended to measure satisfaction with appearance, quality of life, and process of care, was recently developed to address the need for cosmetic PROIs.⁹

The objective of this study was to assess changes in satisfaction with appearance and quality of life among orthognathic surgery and/or genioplasty patients, as well as to highlight the potential use of this new PROI in everyday clinical practice.

MATERIALS AND METHODS

Institutional review board approval was obtained before study initiation. This study was conducted using the FACE-Q, which as mentioned above, is a new facial cosmetic PROI.^{9–13}

As part of the larger FACE-Q validation study, patients presenting for orthognathic surgery (LeFort I and/or BSSO of the mandible) and/or horizontal osseous genioplasty at an academic center in Washington D.C. from 2010 to 2014 were asked to complete the FACE-Q either at the time of their preoperative and/or at postoperative follow-up visits. Specifically, patients completed 3 appearance appraisal scales, including satisfaction with facial appearance overall, satisfaction with lower face and jawline, and satisfaction with chin. In addition, patients completed 2 quality of life scales, including social function, which evaluates social confidence, and psychologic well-being. Of note, all of the scales listed above have been validated, except for the satisfaction with chin scale, which impacted the data analysis as described below. All

TABLE 4. FACE-Q Scores Matching Patients, Pre- Versus Postsurgery

FACE-Q Scale (Range 0–100)	N	Mean (SD)	Δ	P-value
Satisfaction With Facial Appearance Overall				
Presurgery	16	45.5 (13.7)		
Postsurgery	16	74.3 (19.7)	+28.8	<0.01*
Satisfaction With Lower Face and Jawline				
Presurgery	10	41.7 (26.7)		
Postsurgery	10	67.9 (33.2)	+26.2	0.01*
Social Function (Social Confidence)				
Presurgery	9	63.8 (31.5)		
Postsurgery	9	72.6 (32.6)	+8.8	0.26
Psychologic Well-Being				
Presurgery	9	74.7 (29.2)		
Postsurgery	9	80.3 (26.4)	+5.7	0.60
Satisfaction With Chin Item (Range 1–4)[#]				
<i>“Chin in Profile”</i>				
Presurgery	13	1.6 (0.7)		
Postsurgery	13	3.5 (0.8)	+1.9	<0.01*
<i>“Chin Prominence”</i>				
Presurgery	13	1.7 (0.6)		
Postsurgery	13	3.5 (0.8)	+1.8	<0.01*
<i>“Chin Shape”</i>				
Presurgery	13	2.2 (1.1)		
Postsurgery	13	3.3 (0.9)	+1.1	<0.01*
<i>“Chin Overall”</i>				
Presurgery	13	1.8 (0.7)		
Postsurgery	13	3.4 (0.8)	+1.6	<0.01*

[#]The satisfaction with Chin analysis exclude those patients who did not undergo genioplasty (ie, it excludes patients who underwent orthognathic surgery alone); SD, standard deviation; Δ, difference between the pre- and postmean scores.

*P-value is significant (<0.05).

scales ask to be completed with facial appearance in mind. Of note, only data from patients who underwent genioplasty (either alone or in combination with orthognathic surgery) were used in the satisfaction with chin scale analysis.

For patients who completed the FACE-Q scales at multiple postsurgical time points, only the most recent FACE-Q questionnaire was included in data analysis. In addition, given that numerous patients failed to complete the FACE-Q during both pre- and postsurgery visits. A number of relevant variables were compared between the presurgery and postsurgery groups to determine the level of similarity between the 2 groups of patients. These variables included procedure(s) undergone, sex, age, and race.

FACE-Q scores¹⁴ were calculated for each scale. Validated FACE-Q scales are scored from 0 to 100 with higher scores indicating higher satisfaction with appearance or better quality of life. Data analysis was conducted using SPSS Version 21.0 software.¹⁵ The scores for the validated FACE-Q scales were compared with pre- to postsurgery for the overall sample using a mixed linear regression model, with dependent variable the FACE-Q score, and which adjusted for relevant covariates, including procedure, age, sex, and race. As mentioned above, the satisfaction with chin scale has not yet been validated. Therefore, mean scale item responses

(scale of 1–4) were analyzed pre- to postsurgery in the mixed linear regression model. FACE-Q scores were also compared among “matching” patients, patients who completed the FACE-Q both pre- and postoperatively. The “matching” analysis was conducted using paired-sample *t*-tests. Lastly, FACE-Q scores were analyzed among the different procedure groups (orthognathic surgery alone; genioplasty alone; and orthognathic surgery together with genioplasty). *P*-values <0.05 were considered significant.

RESULTS

A total of 49 patients completed the FACE-Q (Table 1). Fourteen patients underwent orthognathic surgery, 17 underwent osseous genioplasty, and 18 underwent orthognathic surgery together with osseous genioplasty. There were 16 “matching” patients, that is, those who completed the FACE-Q both pre- and postsurgery. The overall patient sample ranged in age from 15 to 51 (mean 30.2), were more likely to be female (N = 26, 53.1%), and tended to be white non-Hispanic (N = 29, 59.2%). Importantly, the 2 overall groups of patients who were examined in this study, that is, those who completed the FACE-Q, presurgery and those who completed postsurgery, were very similar, and thus comparable in all of the

TABLE 5. FACE-Q Scores by Procedure

FACE-Q Scale (Range 0–100)	Presurgery		Postsurgery		Pre Versus Post	
	N	Mean (SE) ^b	N	Mean (SE) ^b	Δ	<i>P</i> -value
Satisfaction With Facial Appearance Overall						
Orthognathic surgery	9	43.6 (6.2)	7	79.8 (7.1)	+36.2	<0.01*
Genioplasty	8	53.2 (7.4)	10	70.1 (6.6)	+16.9	0.13
Orthognathic surgery and genioplasty	15	48.5 (4.0)	13	71.5 (4.3)	+23.0	<0.01*
Satisfaction With Lower Face and Jawline						
Orthognathic surgery	6	35.2 (9.5)	7	88.1 (8.8)	+52.9	<0.01*
Genioplasty	— ^c	—	—	—	—	—
Orthognathic surgery and genioplasty	11	47.0 (9.0)	10	74.8 (9.4)	+27.8	0.049*
Social Function (Social Confidence)						
Orthognathic surgery	— ^c	—	—	—	—	—
Genioplasty	7	63.0 (7.6)	10	71.9 (6.2)	+8.9	0.40
Orthognathic surgery and genioplasty	11	63.3 (9.3)	12	70.5 (8.9)	+7.2	0.60
Psychologic Well-Being						
Orthognathic surgery	— ^c	—	—	—	—	—
Genioplasty	7	72.4 (7.9)	10	72.1 (6.5)	−0.3	0.97
Orthognathic surgery and genioplasty	11	77.5 (7.4)	12	76.5 (7.1)	−1.0	0.92
Satisfaction With Chin Item (Range 1–4) ^a						
“Chin in Profile”						
Genioplasty	8	2.1 (0.3)	10	3.5 (0.3)	+1.4	0.01*
Orthognathic surgery and genioplasty	15	2.1 (0.2)	13	3.4 (0.2)	+1.3	<0.01*
“Chin Prominence”						
Genioplasty	8	2.6 (0.3)	10	3.2 (0.3)	+0.6	0.25
Orthognathic surgery and genioplasty	15	2.2 (0.2)	13	3.4 (0.2)	+1.2	<0.01*
“Chin Shape”						
Genioplasty	8	2.5 (0.4)	10	3.1 (0.4)	+0.6	0.39
Orthognathic surgery and genioplasty	15	2.5 (0.3)	13	3.4 (0.3)	+0.9	0.06
“Chin Overall”						
Genioplasty	8	2.4 (0.4)	10	3.2 (0.3)	+0.8	0.17
Orthognathic surgery and genioplasty	15	2.2 (0.3)	13	3.3 (0.3)	+1.1	0.01*

^a The satisfaction with Chin analysis exclude those patients who did not undergo genioplasty (ie, it excludes patients who underwent orthognathic surgery alone); SE, standard error.

^b Mean scores were calculated using a mixed linear regression model adjusting for the following covariates: sex, age, and race; Δ, difference between the pre- and postmean (adjusted) scores.

^c Model cannot be fit because number of observations was not higher than the number of model parameters

* *P*-value is significant (<0.05).

relevant variables (Table 2), including procedure undergone, sex, age, and race.

Among all patients presenting for surgery (Table 3), FACE-Q scores increased significantly following surgery (orthognathic surgery and/or genioplasty) in satisfaction with facial appearance overall (+24.5, $P < 0.01$), satisfaction with lower face and jawline (+40.7, $P < 0.01$), and in all satisfaction with chin items (*profile*, *prominence*, *shape*, and *overall*).

Although patients demonstrated significant increases in satisfaction with appearance, they did not demonstrate similar improvements in quality of life. Patients exhibited enhanced social confidence, but this difference was not statistically significant (+8.9, $P = 0.29$), and patients demonstrated no improvement in psychologic well-being following surgery (-0.8 , $P = 0.92$).

“Matching” patients (Table 4) also demonstrated statistically significant increases following surgery, including in satisfaction with facial appearance overall (+28.8, $P < 0.01$), satisfaction with lower face and jawline (+26.2, $P = 0.01$), and satisfaction with chin ($P < 0.01$ for all 4 items). As in the first analysis, the “matching” patients did not demonstrate statistically significant improvements in quality of life, including in neither social confidence (+8.8, $P = 0.26$) nor psychologic well-being (+5.7, $P = 0.60$).

All 3 procedural groups of patients experienced gains in appearance appraisal following surgery (Table 5). Patients who underwent orthognathic surgery either alone or in combination with genioplasty experienced statistically significant improvements in satisfaction with facial appearance overall ($P < 0.01$ for both groups), and satisfaction with lower face and jawline ($P < 0.01$ for orthognathic surgery alone; $P = 0.049$ for orthognathic surgery together with genioplasty). Patients who underwent genioplasty alone, however, did not experience a statistically significant gain in satisfaction with facial appearance overall ($P = 0.13$). Importantly, patients who underwent orthognathic surgery alone scored highest post-surgery in both facial appearance (79.8) and lower face and jawline (88.1) among the 3 procedural groups.

Both patients who underwent genioplasty alone as well as those who underwent genioplasty together with orthognathic surgery

demonstrated improvement in all satisfaction with chin items. Specifically, patients who underwent genioplasty in combination with orthognathic surgery experienced statistically significant gains in 3 of the 4 items (*profile*, *prominence*, and *overall*), and approached significance in the remaining item (*shape*, $P = 0.06$). Patients who underwent genioplasty alone, however, only experience significant gains in *profile* ($P = 0.01$) but not in the other 3 items (*prominence*, *shape*, and *overall*), indicating that patients who underwent genioplasty in combination with orthognathic surgery experienced more significant gains in satisfaction with chin appearance than those who underwent genioplasty alone.

As in the overall analysis, both patients who underwent genioplasty alone or in combination with orthognathic surgery experience increased levels of social confidence. This increase, however, was not statistically significant. Neither group of patients demonstrated any increase in psychologic well-being following surgery.

DISCUSSION

The LeFort I osteotomy, BSSO of the mandible, and osseous genioplasty are used to reconstruct the facial skeleton, with the goal of restoring ideal aesthetic form and improving function. Given the relative ease of performing genioplasty, many surgeons opt to perform combined orthognathic surgery with genioplasty to enhance aesthetic outcomes.

As orthognathic surgery and genioplasty are typically elective procedures, maintaining a successful practice requires high levels of patient satisfaction. In addition, there continues to be a great degree of competition within the field. The ability to demonstrate patient satisfaction following surgery using a validated PROI, such as the FACE-Q allows surgeons to verify outcomes using a clinically meaningful tool. Surgeons can use this data to determine if they are meeting patient goals, where they are achieving improvements and patient satisfaction, and also where they are not. This information provides feedback to surgeons, and can be used by surgeons to set realistic patient expectations. Furthermore, as medicine continues



FIGURE 1. Pre- and postoperative (4 months) photographs of a 23-year-old man who underwent orthognathic surgery. This patient had a preoperative satisfaction with appearance score of 23 and a postoperative score of 80.



FIGURE 2. Pre- and postoperative (8 months) photographs of a 55-year-old woman who underwent orthognathic surgery combined with genioplasty. This patient had a preoperative satisfaction with appearance score of 44 and a postoperative score of 87.

to trend in an evidence-based medicine direction, plastic surgery patients, as consumers, might request from their surgeons concrete data about previous patients' satisfaction with procedural outcomes during the all-important presurgical consultation. The FACE-Q can be used to provide patients with this information.

Patient-reported outcome data can also be used by clinicians to recognize and appraise specific patients who may have enjoyed successful outcomes as well as those who may not have. Figure 1 shows the preoperative and postoperative (4 months) photographs of a 23-year-old man who underwent orthognathic surgery. The patient had a preoperative satisfaction with facial appearance score of 23 and a postoperative score of 80, demonstrating a surgical success directly from the patient's perspective. Similarly, Figure 2 shows the preoperative and postoperative (8 months) photographs of a 55-year-old woman who underwent orthognathic surgery combined with genioplasty. The patient had preoperative satisfaction with facial appearance score of 44 and a postoperative score of 87, again demonstrating that the patient perceived great improvement in facial appearance following the surgery. Conversely, Figure 3 shows the preoperative and postoperative (2 months) photographs of a 17-year-old boy who underwent orthognathic surgery. He had a preoperative satisfaction with facial appearance score of 61 and an identical postoperative score of 61, demonstrating little enhancement in perceived appearance following orthognathic surgery, although this could be explained by the relatively short follow-up time. Figure 4 contains the preoperative and postoperative (6 months) photographs of a 50-year-old woman who underwent genioplasty alone. The patient had a preoperative satisfaction with facial appearance score of 35 and a postoperative score of 44, demonstrating a potentially smaller than expected improvement in facial appearance, although as explained below, one would expect genioplasty patients to demonstrate lower levels of improvement than patients undergoing orthognathic surgery combined with genioplasty or orthognathic surgery alone. With the information above, surgeons can examine patient cases to determine potential explanations for a patient's lack of perceived improvement, and be better prepared to discuss with the patient whether preoperative expectations were met, and why they may not have been met.

Previous studies have been conducted evaluating patient outcomes following orthognathic surgery or genioplasty, which have found improvements in both satisfaction with appearance and quality of life.^{16–27} Many of these studies, however, used either nonvalidated questionnaires or generic PROI's at best, which are not specifically designed for use in this patient population,^{28,29} which is problematic as condition or procedural specific instruments provide more meaningful data than generic PROIs.^{5,30,31} Furthermore, while some of these studies found improvements in satisfaction with appearance, they did not specifically study satisfaction lower face and jawline or chin appearance, which are the 2 primary areas addressed by these procedures.

The current study is unique as it is the first study to use the FACE-Q to assess satisfaction among this patient population, and it is the first study to use a PROI to compare satisfaction among the 3 groups of surgical patients presented here, that is, those undergoing orthognathic surgery alone, osseous genioplasty alone, and orthognathic surgery combined with genioplasty. As mentioned above, one of the strengths of the FACE-Q is that it is cosmetic procedural specific instrument that contains scales specific to the orthognathic surgery and genioplasty.

The decision to undergo orthognathic surgery may be a difficult decision for many patients given the years of orthodontic treatment required, the potentially difficult and painful postsurgical recovery period, and the possibility of adverse effects, including nerve injuries. Having the ability to use concrete scientific data to demonstrate the positive experiences of previous patients can be used by surgeons to



FIGURE 3. Pre- and postoperative (2 months) photographs of a 17-year-old boy who underwent orthognathic surgery. This patient had both preoperative and postoperative satisfaction with appearance scores of 61.

help new patients understand what may be gained cosmetically, as well as functionally, by undergoing the procedure.

Patients in the current study demonstrated statistically significant increases in satisfaction with appearance following orthognathic surgery and/or genioplasty, including facial appearance overall, lower face and jawline, and chin. Patients also exhibited improved levels of social confidence, although this was not statistically significant. The appearance and quality of life outcome data from this study can be used to assist surgeons in explaining to patients the potential benefits of these procedures.

In the procedural group analysis, all 3 groups of patients demonstrated increased satisfaction with facial appearance overall. Patients undergoing genioplasty alone, however, demonstrated the smallest improvement and it was not statistically significant ($P = 0.13$), as compared with patients who underwent orthognathic surgery either alone or in combination with genioplasty ($P < 0.01$ for both groups). The higher level of improvement in satisfaction with facial appearance demonstrated by orthognathic surgery patients can be explained by the fact that orthognathic surgery is arguably a more significant facial altering procedure than genioplasty. This may also explain why patients who underwent orthognathic surgery combined with genioplasty exhibited greater improvement in satisfaction with chin appearance following surgery than the patients who underwent genioplasty alone. In addition, the lower satisfaction scores of isolated genioplasty indicate that surgical camouflage of a class II occlusion with a genioplasty alone may not be as pleasing to the patient as a true surgical correction of the jaw relationship achieved through orthognathic surgery.

Study limitations include that this reflects a single surgeon's experience, and therefore, the generalizability of the results cannot be assumed. In addition, not every patient was asked to complete the FACE-Q, which may have impacted study results. This was generally because of human error, as office personnel were in charge of allocating and collecting completed FACE-Q questionnaires. Similarly, some patients completed the FACE-Q either presurgery or postsurgery but not both, though the impact of this was minimized using a mixed regression model as described above.



FIGURE 4. Pre- and postoperative (6 months) photographs of a 50-year-old woman who underwent genioplasty. This patient had a preoperative satisfaction with appearance score of 35 and a postoperative score of 44.

Orthognathic surgery and genioplasty are used to create a stable, aesthetically pleasing facial contour, in addition to improving facial function. Patients in this study reported improvements in facial appearance, including lower face and jawline and chin, and social confidence, providing PRO evidence that these procedures can have a positive impact on patient well-being. In addition, the FACE-Q was found to be a useful instrument to measure patient satisfaction, and can potentially serve as an important tool to complement clinical judgment.

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