

Top Five Craniofacial Techniques for Training in Plastic Surgery Residency

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Background: Despite increasing specialization of craniofacial surgery, certain craniofacial techniques are widely applicable. The authors identified five such craniofacial techniques and queried American Society of Plastic Surgeons members and plastic surgery program directors regarding their comfort level with the procedures and their opinion on resident training for these selected procedures.

Methods: First, a select group of senior craniofacial surgeons discussed and agreed on the top five procedures. Second, active American Society of Plastic Surgeons were surveyed regarding their opinion on training and their comfort level with each procedure. Third, plastic surgery residency program directors were studied to see which of the top five procedures are taught as part of the plastic surgery residency curriculum.

Results: The top five widely applicable craniofacial procedures are technically described and include the following: (1) cranial or iliac bone graft for nasal reconstruction, (2) perialar rim bone graft, (3) lateral canthopexy, (4) osseous genioplasty, and (5) bone graft harvest for orbital floor defects. For practicing plastic surgeons, comfort level in all procedures increased with advancing years in practice (except those with <5 years). A majority of plastic surgeons (>75 percent), especially those with craniofacial fellowship training, felt competent in all procedures except osseous genioplasty (53 percent). Plastic surgery program directors agreed that all top five procedures should be mastered by graduation.

Conclusions: Although program directors felt that all five selected craniofacial procedures should be taught and mastered during residency training, plastic surgeons without craniofacial fellowship training were less comfortable with the techniques. Residency training goals should include competence in core craniofacial techniques. (*Plast. Reconstr. Surg.* 129: 477e, 2012.)

Since the pioneering days of Dr. Paul Tessier, craniofacial surgery has been in evolution, with current focus on refinements of established techniques. Beyond correcting underlying skeletal defects, craniofacial balance and cosmetic outcome are currently emphasized. Symmetry is fundamental in facial attractiveness.¹ Although

aesthetic/reconstructive and craniofacial surgery attracts two very different types of patients, each with a different focus, both types desire an aesthetically pleasing outcome. Many of the hard- and soft-tissue manipulations conducted during craniofacial procedures can be used for improving outcomes in cosmetic and other plastic surgery patients.

Directors of plastic surgery training programs encourage the teaching of fundamental principles and operative techniques of all the plastic surgery subspecialties. In craniofacial surgery, there are certain operations, such as fronto-orbital advancement or facial bipartition, that many plastic surgeons may never perform in their actual practice (unless they have decided to undergo additional

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training as a craniofacial fellow and secure a position in a specialized center). However, other craniofacial procedures, intrinsic to the subspecialty, are useful to all plastic surgeons regardless of their type of practice. It is these craniofacial techniques that should be identified and taught. These procedures may be considered necessary instruments or tools available to the plastic surgeon. To identify which craniofacial techniques should be considered the most important for a plastic surgery resident to learn during training, we studied the answers to the following three questions:

1. What are the top five craniofacial techniques that all plastic surgery residents should know? For this question, a select group of senior craniofacial surgeons were asked to agree on the top five procedures.
2. Of the top five procedures, which ones do practicing plastic surgeons perform? To answer this, we surveyed active American Society of Plastic Surgeons members.
3. Of the top five procedures which ones are taught as part of the plastic surgery residency curriculum? To answer this, we asked plastic surgery residency program directors in the United States which procedures they expect their graduating residents to have mastered.

METHODS

To establish the top five craniofacial techniques list, five active, senior craniofacial surgeons were consulted (H.K.K., J.G.M., S.P.B., D.C.M., and S.A.W.). They were asked to identify common craniofacial techniques they teach craniofacial fellows and residents that can be used in practice by *any* board-certified plastic surgeon. In addition, they were told to include craniofacial techniques that should be mastered by the time of graduation from a plastic surgery residency program. The senior craniofacial surgeons were initially given a list of 20 craniofacial techniques from which to choose. This list of 20 craniofacial techniques and procedures was created based on a focus group of clinical and academic plastic surgeons from various subspecialties. The senior craniofacial surgeons were also able to “write-in” techniques if necessary. Their responses were used to create a list of the 10 top craniofacial techniques. This list was narrowed down and, through this process, the top five craniofacial technique list was created.

American Society of Plastic Surgeons Member Survey

To determine the current use of and comfort level with the top five craniofacial techniques by active plastic surgeons, a short, 12-question survey was created. Interviews from 10 active American Society of Plastic Surgeons members were conducted as a focus group to write the survey for accurate, clear wording, with appropriate topic redundancy. This two-part survey first determined respondent demographics, including years in practice and craniofacial fellowship status. Next, the respondent’s personal experience with, and opinion on, the importance of knowing the top five craniofacial techniques was determined. This questionnaire was designed as a web-based survey (<http://www.surveymonkey.com>) to be completed in approximately 90 seconds to maximize response rates. To avoid ambiguity, responses to questions were either “yes” or “no.” This online survey was then emailed to a random list of active American Society of Plastic Surgeons members ($n = 4083$). Surveys were distributed at three different time points, as instructed by the Dillman method for increasing responses.²

Plastic Surgery Program Director Survey

To determine how the top five craniofacial techniques are currently incorporated into plastic surgery training programs, we surveyed the directors of all Accreditation Council for Graduate Medical Education–approved plastic surgery programs, as listed on the FRIEDA database (<http://www.ama-assn.org/ama/pub/education-careers/graduate-medical-education/freida-online.shtml>). This plastic surgery program director survey was created after phone interviews with five residency program directors. The program director survey differed slightly from the American Society of Plastic Surgeons member survey. Each program director was asked about the existence of a craniofacial fellowship in their program. In addition, the program director was asked for their opinion on the importance of teaching the top five craniofacial techniques and whether graduating residents had mastered the techniques. The program directors were not given details on how the top five craniofacial techniques were selected (i.e., they were not told that senior craniofacial surgeons were involved with helping create the list).

Statistical Analysis

For statistical analysis, data were imported into an Excel spreadsheet (Microsoft Corp., Redmond,

Wash.), cleaned, and uploaded to the SAS statistical package (SAS Institute, Inc., Cary, N.C.) for interpretation. The responses to each question were tabulated using frequencies and percentages. A Yates chi-square test was used to test for correlation between questions. The Fisher's exact test was used when an expected value was less than 5. To give a better sense of the effect sizes and directions, we also report odds ratios and corresponding 95 percent confidence intervals. For this portion of the analysis, young surgeons were defined as less than or equal to 15 years in practice, whereas older surgeons were defined as greater than 15 years in practice, to create binary variables.

RESULTS

The top five craniofacial techniques identified by our five active senior craniofacial surgeons (H.K.K., J.G.M., S.P.B., D.C.M., and S.A.W.) were as follows: (1) cranial or iliac bone graft for nasal reconstruction, (2) perialar rim bone grafts, (3) lateral canthopexy with full canthal tendon release/mobilization and fixation to orbital rim, (4) osseous genioplasty, and (5) cranial bone graft harvest for orbital floor (fracture) defects. Although other important craniofacial techniques were suggested, these stood out as common craniofacial procedures that can be used in practice by *any* board-certified plastic surgeon and should be mastered by the time of graduation

from a plastic surgery residency program. A brief description of the procedures is described below.

Cranial or Iliac Bone to the Nasal Dorsum

Although dorsal augmentation during rhinoplasty may be performed using implant materials (silicone) or cartilage grafts, bone grafts are particularly useful for lengthening a foreshortened nose or for performing a nasal reconstruction (Fig. 1). Both cranial and iliac bone have been shown to provide volume, stability, and durability, with minimal resorption.³ For the cranial bone graft harvest, the nondominant hemisphere (right side for right-handedness) is marked as an anteroposterior zigzag incision. Next, subperiosteal exposure, burring down to the diploic space, and harvesting of the outer table or ectocranial bone (1.5×4.5 cm) is performed. The graft is shaped by tapering at the ends. For nasal lengthening, a closed nasal dissection with complete degloving is performed. The graft is placed in the dorsal pocket with the distal end placed beneath the alar domes.⁴ It is then secured percutaneously with a lag screw just below the radix (0.8×11 mm). Placement of iliac bone graft is similar.

Perialar Rim Graft

Perialar deficiency, defined as a lack of skeletal support at the nasal base, results in poor projection of the distal third of the nose, ptosis of the



Fig. 1. (Left) Preoperative and (right) postoperative views of a patient who underwent cranial bone grafting to the nasal dorsum.

upper lip and nasal lip, retrusion of alar base posterior to cheek projection, and an acute columella labial angle.^{5,6} Congenital clefting, Binder syndrome, and traumatic injury may all cause nasomaxillary hypoplasia. Although a Le Fort II advancement will correct this skeletal deficiency, with a normal class I occlusion, a perialar rim graft is a better surgical option. This technique involves a mandibular gingivobuccal sulcus incision and subperiosteal dissection to harvest the buccal cortex of the anterior ramus.⁷ Two crescent-shaped bone grafts (1.5×2.5 cm) are fashioned and fixed to the perialar region with lag screws.⁸ Correction results in aesthetic improvement in the profile with nasal tip elevation, alar base widening, and augmentation of the upper lip sagittally (Fig. 2).

Lateral Canthopexy with Full Canthal Tendon Release/Mobilization and Fixation to Orbital Rim

With advanced age, the lateral canthal tendon attenuates, causing a medial drift of the lateral canthus, shortening of the horizontal palpebral fissure, and laxity of the lower eyelid.⁹ Surgical tightening of the tendon leads to improvement in lid tone, posture, and upward tilt for the lower eyelid.¹⁰ A canthopexy (nonlysis) or canthoplasty (lysis) may be performed based on the severity of laxity and lower lid distraction testing.¹¹ Technically, from an upper supratarsal fold incision, the lateral canthus is iden-

tified with a single hook. Release of deep ligamentous attachments of the inferolateral orbit, binding the lateral tarsus and canthal tendon to the periosteum, is then performed to allow for full mobilization of the canthal tendon.^{12,13} The freed lateral canthus is then repositioned along the superolateral orbital rim. Care should be taken in patients with a proptosis and/or a negative vector not to “clothesline” the lower eyelid beneath the globe. Rather, the canthus may be positioned higher and more medial on the orbital rim or a dermal pennant canthoplasty may be used.¹⁴ Fixation may then be accomplished to the orbital periosteum or to the bone through drill holes using nonabsorbable sutures. The utility and widespread applicability of this procedure for protection against ectropion in lower lid rejuvenation and in lower eyelid reconstruction make it important for every plastic surgeon (Fig. 3).^{10,15–17}

Osseous Genioplasty

Chin position may impact facial proportions, symmetry, and overall facial harmony. Genioplasties should be considered in combination with rhinoplasties, maxillary/mandibular osteotomies, or other procedures to achieve good balance of the final facial profile (Fig. 4).¹⁸ Although many genioplasties may be performed with an alloplastic implant to correct anterior deficiencies of the chin, an osseous genioplasty is needed to correct vertical height, midline discrepancies, and



Fig. 2. (Left) Preoperative and (right) postoperative views of a patient who underwent perialar rim grafting.



Fig. 3. (Above) Preoperative and (below) postoperative views of a patient who underwent lateral canthopexy to correct symptomatic right lower eyelid paralytic ectopion.



Fig. 4. (Left) Preoperative and (right) postoperative views of a patient who underwent osseous genioplasty.

other asymmetries. Preoperatively, assessment of the lower face height, facial profile, and chin position along the Riedel line should be performed. Technically, the procedure is performed intraorally through an anterior mandibular gingivobuccal sulcus incision. Subperiosteal undermining is used with care to avoid degloving the chin and stripping the mentalis attachments. The mandibular midline is marked with an oscillating saw. An osteotomy is

made horizontally at least 5 mm below the mental foramen, and downfracture is then performed.¹⁹ Once repositioning is accomplished, rigid plate fixation is performed in the midline. Soft tissues are repositioned and the incision is closed.

Bone Graft Harvest for Orbital Floor Defects

As a protective mechanism to avoid globe injury during trauma, the orbital floor and medial orbital

wall are thin and commonly fractured (Fig. 5). Although “off-the-shelf” alloplastic materials seem easier to use for reconstruction, bone grafts have lower exposure/infection rates and should be considered the criterion standard. Calvarial bone graft is advantageous because of its rigid structure, ability to incorporate into the matrix of the orbital floor, and low morbidity (<0.02 percent neurologic complications in 12,672 patients).²⁰ Likely because of the increased cortical bone content,²¹ membranous calvarial bone experiences decreased resorption and earlier vascularization than its endochondral counterparts.^{22,23} Technically, through a nondominant hemisphere, a parasagittal zigzag parietal incision is made. Supraperiosteal exposure is obtained and a Tessier osteotome is used to “shave” the top layer of the ectocortical bone as an appropriately sized graft for the defect. The wound is closed and the graft is positioned over the orbital defect resting on the posterior ledge of the intact orbit to prevent enophthalmos.

American Society of Plastic Surgeons Member Competence Survey on the Top Five Craniofacial Procedures

Of the active members who completed the survey ($n = 640$), the largest respondent group by years in practice was the greater-than-20-years group (39.5 percent). The majority of respondents (79.1 percent) did not complete a formal fellowship train-

ing (12 months postresidency) in craniofacial surgery (Table 1).

Years in Practice versus Comfort in Performing Techniques

Except for osseous genioplasty, most surgeons felt comfortable with the top five craniofacial techniques. For osseous genioplasty, only 53.1 percent of surgeons felt comfortable performing the procedure. Comfort in procedures increased with years in practice, except in those with less than 5 years' experience and who felt more comfortable with many techniques (Fig. 6). The null hypothesis of no relationship between years of practice (question 1) and cranial or iliac crest bone graft for nasal reconstruction (question 3), perialar rim bone graft (question 5), and lateral canthopexy (question 7) was rejected ($p < 0.05$). Young craniofacial surgeons (≤ 15 years' experience) are more comfortable with lateral canthopexy (question 7: odds ratio, 0.61; 95 percent confidence interval, 0.4 to 0.92) but less comfortable with cranial or iliac crest bone graft for nasal reconstruction ((question 3: odds ratio, 1.52; 95 percent confidence interval, 1.05 to 2.2) and perialar rim bone grafts (question 5: odds ratio, 1.62; 95 percent confidence interval, 1.16 to 2.27).

Craniofacial Training versus Comfort in Performing Techniques

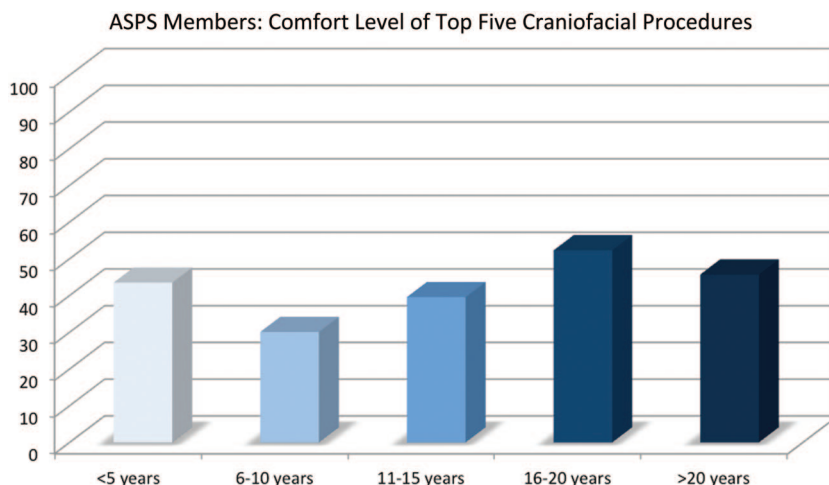
The null hypothesis of no relationship between the craniofacial fellowship training (question 2) and the level of comfort was rejected ($p < 0.05$) for all techniques (Fig. 7). Surgeons who did



Fig. 5. (Left) Preoperative and (right) postoperative views of a patient who underwent bone graft harvest for a left orbital floor defect to correct posttraumatic enophthalmos.

Table 1. Responses to Questions 2 through 12 of the American Society of Plastic Surgeons Member Survey

	Response	
	Yes (%)	No (%)
Question 2: Have you completed formal fellowship training in craniofacial surgery (i.e., 12 mo postresidency)?	134 (20.9)	506 (79.1)
Question 3: Do you feel comfortable performing cranial (i.e., split parietal) or iliac crest bone graft for nasal reconstruction?	463 (75.7)	149 (24.3)
Question 4: Should graduating plastic surgery residents be expected to perform cranial (i.e., split parietal) or iliac crest bone graft for nasal reconstruction?	486 (79.4)	126 (20.6)
Question 5: Do you feel comfortable performing perialar rim bone grafts (i.e., onlay bone grafts augmentation for nasomaxillary deficiencies)?	408 (66.7)	204 (33.3)
Question 6: Should graduating plastic surgery residents be expected to perform perialar rim bone grafts (i.e., onlay bone graft augmentation for nasomaxillary deficiencies)?	432 (70.6)	180 (29.4)
Question 7: Do you feel comfortable performing a lateral canthopexy (with full canthal tendon release/mobilization and fixation to orbital rim, as opposed to a lateral canthoplasty support suture)?	501 (81.9)	111 (18.1)
Question 8: Should graduating plastic surgery residents be expected to perform a lateral canthopexy (with full canthal tendon release/mobilization and fixation to orbital rim, as opposed to a lateral canthoplasty support suture)?	556 (90.8)	56 (9.2)
Question 9: Do you feel comfortable performing an osseous genioplasty?	325 (53.1)	287 (46.9)
Question 10: Should graduating plastic surgery residents be expected to perform an osseous genioplasty?	438 (71.6)	174 (28.4)
Question 11: Do you feel comfortable performing bone graft harvest (both split calvarial bone grafts and/or iliac crest bone grafts) for orbital floor defects?	482 (78.8)	130 (21.2)
Question 12: Should graduating plastic surgery residents be expected to perform bone graft harvest (both split calvarial bone grafts and/or iliac crest bone grafts) for orbital floor defects?	513 (83.8)	99 (16.2)

**Fig. 6.** Average comfort level for all procedures among different "years in practice" groups derived from the American Society of Plastic Surgeons member survey.

not have craniofacial training felt less comfortable in performing cranial or iliac crest bone grafting for nasal reconstruction (question 3: odds ratio, 13.11; 95 percent confidence interval, 4.75 to 36.17), perialar rim bone grafting (question 5: odds ratio, 13.91; 95 percent confidence interval, 6.01 to 32.21), osseous genioplasty (question 9: odds ratio, 13.93; 95 percent confidence interval, 7.31 to 26.51), and bone graft harvest for orbital floor defects (question 11: odds ratio, 22.41; 95

percent confidence interval, 5.46 to 91.92). Interestingly, those who did not complete a formal fellowship in craniofacial surgery felt increased comfort with lateral canthopexy (question 7: odds ratio, 5.57; 95 percent confidence interval, 2.39 to 13.01).

Years in Practice versus Opinion on Residency Training

Most surgeons agreed that consensus techniques were worthwhile for all graduating resi-

ASPS Members: Comfort Level of Top Five Craniofacial Procedures with Craniofacial Training

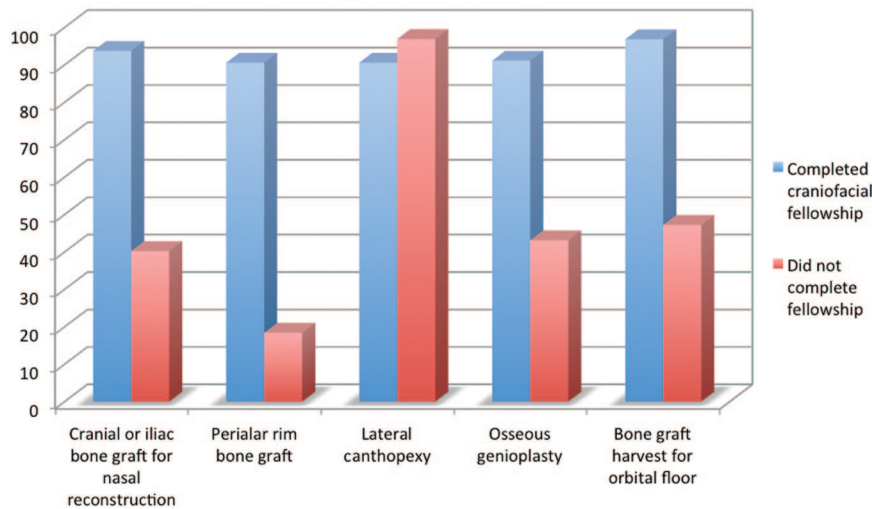


Fig. 7. Difference in comfort level of procedure between those who did and did not complete a craniofacial fellowship derived from the American Society of Plastic Surgeons member survey. All differences were statistically significant ($p < 0.05$). Craniofacial training improved comfort level with all procedures, except for lateral canthopexy (question 7). Interestingly, those who did not complete a craniofacial fellowship felt more comfortable with the lateral canthopexy (not statistically significant).

dents to master (Table 1). The null hypothesis of no relationship between age of the surgeon (question 1) and their opinion on resident training was rejected ($p < 0.05$) for the surveyed techniques. The younger surgeon (≤ 15 years in practice) is more likely to answer that residents do not need to master bone grafting for nasal reconstruction (question 4: odds ratio, 2.33; 95 percent confidence interval, 1.55 to 3.49), perialar rim bone grafting (question 6: odds ratio, 2.44; 95 percent confidence interval, 1.71 to 3.49), and bone graft harvest for orbital floor defects (question 12: odds ratio, 2.66; 95 percent confidence interval, 1.69 to 4.19).

Craniofacial Training versus Opinion on Residency Training

The null hypothesis of no relationship between craniofacial fellowship (question 2) and lateral canthopexy (question 8) and bone graft harvest for orbital floor defects (question 12) was rejected ($p < 0.05$). Surgeons without craniofacial training were less likely to answer “no” when prompted whether residents should master lateral canthopexy (question 8: odds ratio, 0.30; 95 percent confidence interval, 0.17 to 0.54) and bone graft harvest for orbital floor defects (question 12: odds ratio, 0.57; 95 percent confidence interval, 0.35 to 0.93).

Correlation between Comfort with Procedure and Opinion on Residency Training

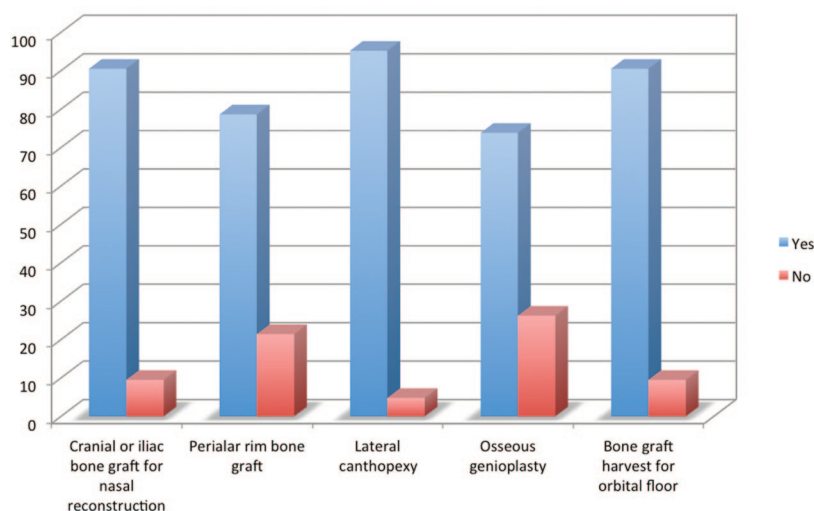
The null hypothesis of no relationship between comfort with performing the procedure (questions 3, 5, 7, 9, and 11) and opinion on residency training (questions 4, 6, 8, 10, and 12) was rejected with every single procedure ($p < 0.05$). Those that were comfortable performing the procedure were more likely to suggest that graduating residents be comfortable as well (odds ratio, >1).

Program Director Survey on Need for Training in the Top Five Craniofacial Procedures

Of the 43 surveys returned, 67.4 percent of programs did not have a formal craniofacial fellowship (Table 2). Seventy-four percent of program directors did not complete formal fellowship training in craniofacial surgery. The majority of program directors felt comfortable with most techniques. Most program directors agree that the top five craniofacial techniques are important for the graduating resident to master (Fig. 8). No relationship was found between the existence of craniofacial fellowships at certain programs or program director completion of craniofacial fellowship and the program director's expectation with regard to resident performance of the top five craniofacial techniques.

Table 2. Responses to Questions 1 through 12 of the Program Director Survey

	Response	
	Yes (%)	No (%)
Question 1: Does your program have a craniofacial fellowship training program?	14 (32.6)	29 (67.4)
Question 2: Have you completed formal fellowship training in craniofacial surgery (i.e., 12 mo postresidency)?	11 (25.6)	32 (74.4)
Question 3: Do you feel comfortable performing cranial (i.e., split parietal) or iliac crest bone graft for nasal reconstruction?	31 (79.5)	8 (20.5)
Question 4: Should graduating plastic surgery residents be expected to perform cranial (i.e., split parietal) or iliac crest bone grafting for nasal reconstruction?	35 (89.7)	4 (10.3)
Question 5: Do you feel comfortable performing perialar rim bone grafting (i.e., onlay bone graft augmentation for nasomaxillary deficiencies)?	28 (71.8)	11 (28.2)
Question 6: Should graduating plastic surgery residents be expected to perform perialar rim bone grafting (i.e., onlay bone graft augmentation for nasomaxillary deficiencies)?	30 (76.9)	9 (23.1)
Question 7: Do you feel comfortable performing a lateral canthopexy (with full canthal tendon release/mobilization and fixation to orbital rim, as opposed to a lateral canthoplasty support suture)?	36 (92.3)	3 (7.7)
Question 8: Should graduating plastic surgery residents be expected to perform a lateral canthopexy (with full canthal tendon release/mobilization and fixation to orbital rim, as opposed to a lateral canthoplasty support suture)?	37 (94.9)	2 (5.1)
Question 9: Do you feel comfortable performing an osseous genioplasty?	21 (53.8)	18 (46.2)
Question 10: Should graduating plastic surgery residents be expected to perform an osseous genioplasty?	29 (74.4)	10 (25.6)
Question 11: Do you feel comfortable performing bone graft harvest (both split calvarial bone grafts and/or iliac crest bone grafts) for orbital floor defects?	34 (87.2)	5 (12.8)
Question 12: Should graduating plastic surgery residents be expected to perform bone graft harvest (both split calvarial bone grafts and/or iliac crest bone grafts) for orbital floor defects?	35 (89.7)	4 (10.3)

Plastic Surgery Program Directors: Training Importance of Top Five Craniofacial Procedures**Fig. 8.** Opinions of plastic surgery program directors in the United States. Most feel that all graduating residents should master the top five consensus techniques.

DISCUSSION

Plastic surgery is an ever-expanding specialty that is trending toward subspecialization, including hand surgery, microsurgery, burns, cosmetic, composite tissue transplantation, craniofacial surgery, and other fields. As with other highly specialized subspecialty fields of plastic surgery, certain procedures are typically mastered only at the

fellowship level. However, there are craniofacial procedures that have a wide applicability and thus may be performed by all plastic surgeons. The senior craniofacial surgeons (H.K.K., J.G.M., S.P.B., D.C.M., and S.A.W.) agreed on five craniofacial techniques that they felt should be taught to all plastic surgery residents so that they have an adequate comfort level in performing these tech-

niques on graduation. Although there are other worthwhile craniofacial techniques for plastic surgeons to learn, these were the ones selected based on our process and criteria. With the ability to perform these five procedures, a plastic surgeon has more versatility in selecting the best procedure for the given case. For instance, a cranial or iliac bone graft may be the best procedure for a patient with a saddle nose deformity or a patient who develops a foreshortened nose from multiple rhinoplasties (Fig. 1).

A survey of the American Society of Plastic Surgeons members and plastic surgery program directors indicates that a majority of plastic surgeons agreed on the importance of competence with these five craniofacial techniques in practice. The majority of surgeons felt comfortable with performing these procedures, except for osseous genioplasty (Table 1). On further analysis, it was found that craniofacial training improves comfort with all procedures, except for lateral canthopexy. Although most plastic surgeons and program directors agree that these five craniofacial techniques are important to know, more surgeons without craniofacial training unsurprisingly felt less comfortable performing all top five craniofacial techniques. More years in practice (>15) increased comfort with two procedures: cranial or iliac crest bone graft for nasal reconstruction and perialar rim grafting.

As a possible reflection of a shift in training perspectives, younger plastic surgeons (≤ 15 years in practice) were more likely to feel that graduating plastic surgeons do not need to master the following procedures: bone grafting for nasal reconstruction, perialar rim bone grafting, and bone grafting for orbital floor defects. However, those that were more comfortable with any of the top five procedures were more likely to suggest graduating residents be as well, suggesting that those who use these techniques realize the widespread applicability. Interestingly, surgeons without craniofacial training were more likely to feel residents should master lateral canthopexy and bone graft harvest for orbital floor defects. Overall, as a group, more surgeons feel less comfortable with osseous genioplasty, whereas younger surgeons without craniofacial training felt more comfortable with lateral canthopexy.

With program directors, all felt that these five craniofacial techniques were important for the graduating plastic surgeon to master (Table 2). No relationship was found between the presence of a craniofacial training program in their respective program and/or actually completing cranio-

facial training and their opinions on resident training. Further study needs to be performed on what gaps in craniofacial education exist in residency, and what surgeons feel should be included in their training to better care for patients in their practice. A perceived weakness of our study may be the use of the “expert task force” in finalizing the procedure studied. However, this style of evaluating surgical competencies has been performed in the otolaryngology literature²⁴ and represents the most plausible method of narrowing down 20 or more procedures, without decreasing number of program director and American Society of Plastic Surgeons member responses and the power of the study. We feel that our survey is an important first step in reexamination of the current state of craniofacial competency training in plastic surgery residency.

CONCLUSIONS

An effort should be made to continue to teach basic craniofacial principles and important craniofacial techniques so that all plastic surgeons will be able to offer the best procedure available to their patients. The authors identified five such craniofacial procedures, established the comfort level of these procedures through an American Society of Plastic Surgeons member survey, and confirmed the need for training with the input of plastic surgery program directors. Reexamination of the current curriculum with minimum number of cases performed for these important craniofacial procedures may be considered.

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