# Outcomes Analysis of Chief Cosmetic Clinic Over 13 Years

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**Background:** Adequate resident training in aesthetic surgery has become increasingly important with rising demand. Chief resident aesthetic clinics allow hands on experience with an appropriate amount of autonomy. The purpose of this study was to compare resident cosmetic clinic outcomes to those reported in the literature. Furthermore, we sought to assess how effective these clinics can be in preparing residents in performing common aesthetic surgery procedures.

**Method:** A retrospective chart review of 326 patients and 714 aesthetic procedures in our chief cosmetic clinic over a 13-year period was performed, and complication and revision rates were recorded. In addition, an electronic survey was sent to 26 prior chief residents regarding their experience and impressions of the chief resident aesthetic clinic.

**Result:** A total of 713 procedures were performed on 326 patients. Patient ages ranged from 5 to 75 years old (mean, 40.8 years old) with a mean follow-up of 76.2 days. On average, there were 56 procedures performed per year. Of the 714 total procedures performed, there were 136 minor procedures and 578 major procedures. Of the 136 minor procedures, there were no complications and there was 1 revision of a cosmetic injection. Of the 578 major procedures, the overall complication rate was 6.1% and the revision rate was 12.8%. Complication and revision rates for each individual surgery were further analyzed and compared with the literature. The complication rates for these procedures fell within the reference ranges reported. In regards to the chief resident survey, there was a 77% response rate. All respondents reported that the chief resident clinic positively affected their residency education and future practice. Ninety percent of respondents felt "very comfortable" performing facelifts, body contouring, and aesthetic breast surgery. No respondents completed a subsequent cosmetic fellowship, and 60% stated that their positive experience in chief clinic contributed to their decision not to pursue a cosmetic fellowship.

**Conclusions:** Chief resident clinics can provide results with acceptable complication and revision rates that fall within the acceptable ranges in the literature. In addition, it provides a valuable experience that leaves residents with high comfort levels in performing key procedures in aesthetic surgery.

**Key Words:** resident cosmetic clinic, resident education, complication rates, complication comparison, outcomes, aesthetic surgery, revision rates

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The importance of resident education in aesthetic surgery has never been higher owing to increasing demand. In the United States, cosmetic procedures have increased 39% over the past 5 years with 15.9 million procedures performed in 2015 alone.[1,2] It is the responsibility of residency programs to produce a curriculum that prepares its residents to meet this demand. Chief resident aesthetic clinics have become the major modality for this training because they allow direct patient contact and independent decision making while providing a safe environment for the patient.

The significance of adequate aesthetic training has been reflected in Accreditation Council for Graduate Medical Education requirements in which the residents are currently required to have 150 aesthetics cases, surpassing the case requirements of several other important areas of plastic surgery such as hand/upper extremity and breast reconstruction. Furthermore, as the field of aesthetic surgery continues to be encroached upon by other fields, it becomes critical that plastic surgery programs produce experienced graduates that can provide consistent results and positive patient experiences.

Resident training in aesthetic plastic surgery offers several unique challenges. Because most patients pay out of pocket, they expect an optimal result with low revision rates. In addition, these cases are elective in nature and there is little tolerance for complications. To circumvent these difficulties, our institution has developed a chief resident cosmetic clinic that allows appropriate autonomy but also demands thorough preoperative preparation.

For the past 24 years, our residents have received hands on experience in managing all phases of care in our chief resident aesthetic clinic. This clinic has delivered acceptable complication and revision rates, first reported by Pyle et al[3] in an outcomes study reviewing 7 years of clinical data. Since this original report, several articles have shown similar outcomes with no reports of litigation. These studies suggest that a chief resident clinic can provide safe and efficacious results to this high-demand patient population, but there has been little reported on the benefits they bestow to residents. In this study, we sought to update our outcomes over a 13-year period in the Wake Forest chief resident clinic and compare safety and efficacy to the literature. In addition, we examined how this experience has impacted our resident's comfort level in performing common cosmetic procedures and how it influenced their decision to pursue aesthetic fellowships.

## PATIENTS AND METHODS

The authors performed an institutional review board–approved retrospective chart review of all patients who underwent invasive procedures through the chief resident aesthetic clinic at Wake Forest Baptist Health over a 13-year period from July 2000 to June 2013. The complication and revision rates of major and minor procedures were noted. The minor procedure data were kept separate from those of major procedures to prevent skewing results owing to their inherent low complication and revision rates.

A total of 326 patients met the inclusion criteria for this study. Of note, many underwent combined procedures simultaneously or multiple procedures in subsequent years. A total of 714 total procedures were performed, including 578 major and 136 minor procedures. The breakdown of major procedures included 108 abdominoplasties, 28 augmentation/mastopexies, 12 brachioplasties, 58 cosmetic breast augmentations, 7 breast reductions, 27 brow lifts, 7 capsulectomies, 6 circumferential abdominoplasties, 23 implant exchanges, 2 otoplasties, 45 lower blepharoplasties, 110 liposuction procedures, 26 mastopexies, 9 medial thigh lifts, 17 neck lifts, 7 rhinoplasties, 45 rhytidectomies, and 42 upper blepharoplasties (Figs. 1–3). The breakdown of minor procedures included 60 laser procedures, 23 injections of botox and/or filler, and 53 other procedures (cosmetic peels etc) (Fig. 4).

Procedures that met the inclusion criteria were evaluated for revision surgeries and complication rates based on a collection of outcome measures for each procedure defined in the literature. Complications were defined as either major or minor. Minor complications were those with local effects including hematomas, seromas, wound dehiscence, local tissue necrosis, implant ruptures, infection, and

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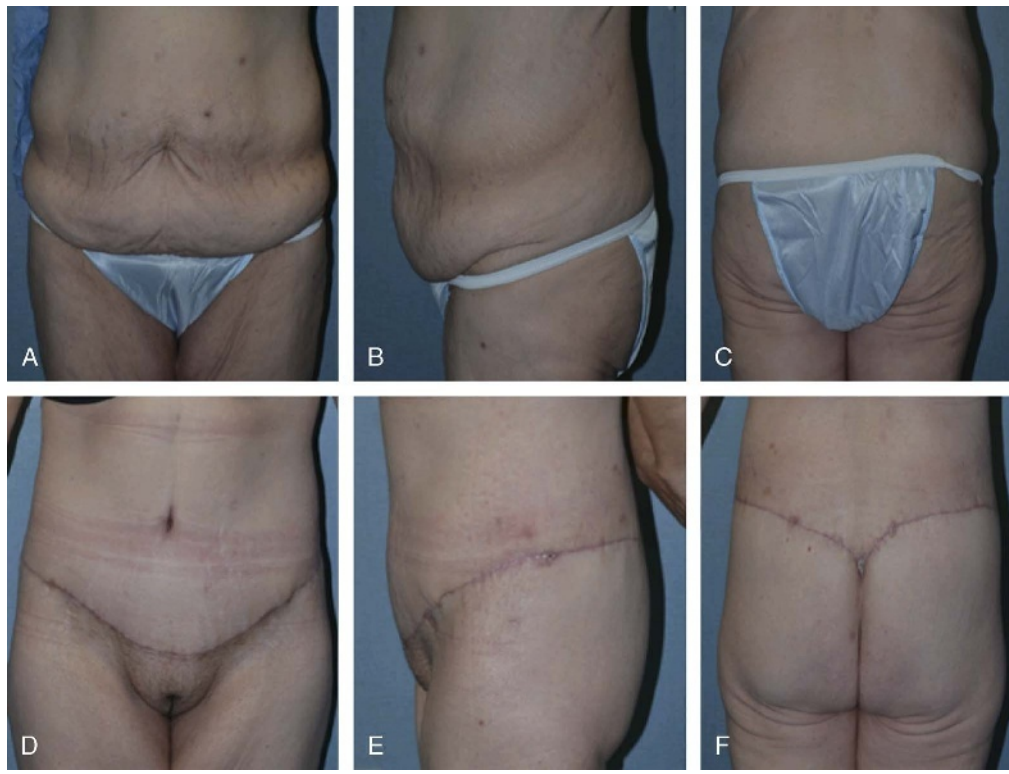


**FIGURE 1.** A, B, C, This is a 42-year-old female with history of massive weight loss after gastric sleeve. She underwent circumferential belt lipectomy for improved lower torso contour. D, E, F, 3-month postoperative photos.

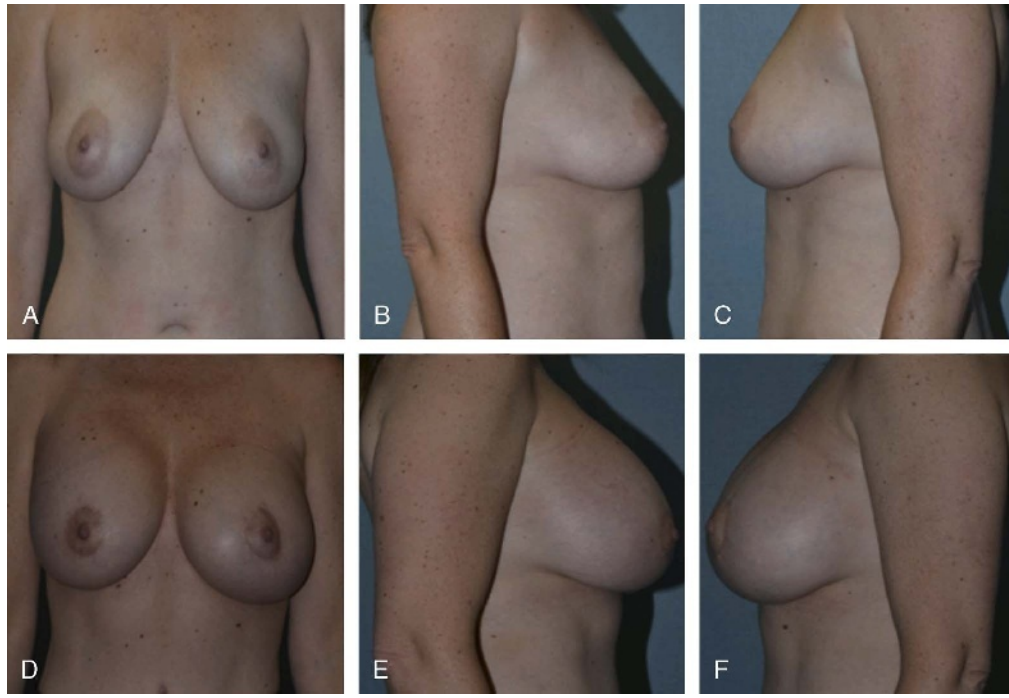


**FIGURE 2.** A, B, C, This is a 43-year-old female who underwent a periareolar superior crescent mastopexy and areolar reduction as well as breast augmentation for treatment of mammary ptosis. Postoperatively, she experienced excess superior pole fullness on the right side that failed conservative treatment and underwent right breast capsulotomy and implant repositioning 6 months later. D, E, F, 8-month postoperative photos after original surgery.

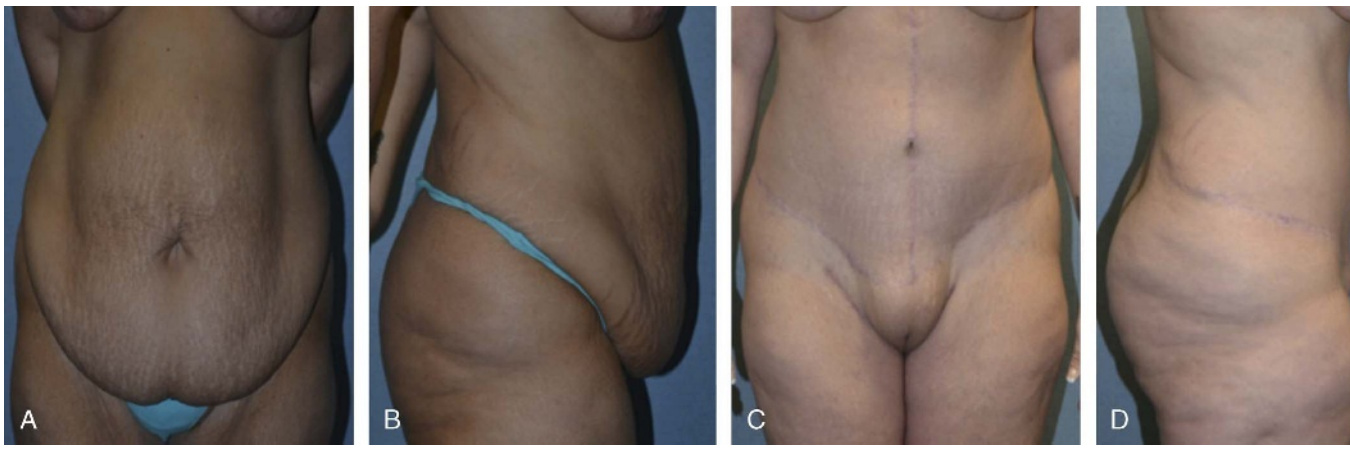


**FIGURE 3.** A, B, This is a 47-year-old female with history of 80 pound weight loss through diet/exercise who presented for consultation for treatment excess skin and lipodystrophy of the abdomen. She underwent fleur de leis abdominoplasty to treat both horizontal and vertical tissue excess. C, D, 3-month postoperative photos.

hypertrophic scarring. Major complications were defined as those with systemic effects threatening life or limb including deep vein thrombosis, pulmonary embolism, myocardial infarction, cerebrovascular insult, shock, and death.

An 18-question electronic survey was distributed to all 26 chief residents over the 13-year period from July 2000 to June 2013 regarding their experience and impressions of the chief resident aesthetic clinic. Specific questions were asked about their comfort level with common procedures in aesthetic surgery at the completion of residency as well as their overall impression of the clinic's contribution to their aesthetic surgery training.

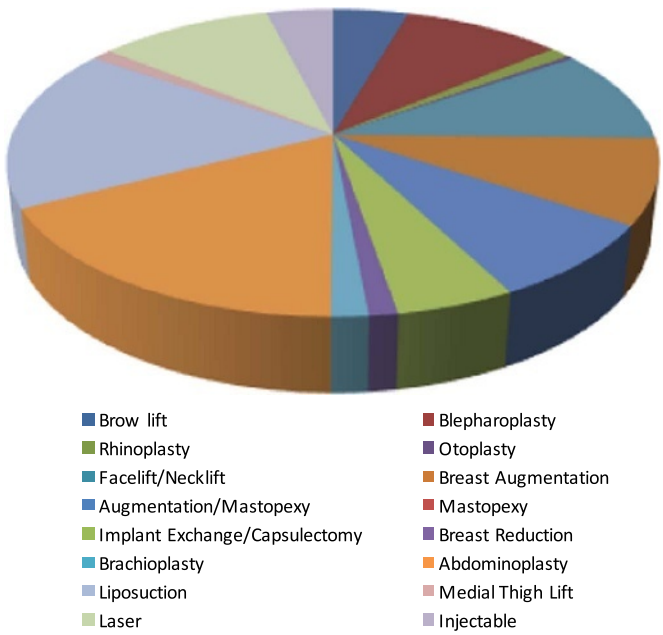


**FIGURE 4.** Breakdown of major procedures performed over a 13-year-old period in our chief resident clinic. A total of 714 total procedures were performed, including 578 major and 136 minor procedures.

## RESULTS

All procedures performed over a 13-year period in our chief resident cosmetic clinic were reviewed. The mean number of procedures performed per year was 56 in total with 45 major and 11 minor. The age range of our clinic patients was 5 to 75 years with a mean age of 40.8 years. Mean follow-up was 76.2 days. Of the 136 minor procedures performed, there were no recorded complications and 1 revision (0.7% revision rate) of a cosmetic injection. In addition, there were no reports of litigation over the past 13 years in this clinic.

Overall complication rate for major procedures was 6.1% (5.9% minor complication rate, n = 34, and 0.2% major complication rate, n = 1). Individual complication rates for each major procedure were as follows: abdominoplasty (10.2%, 11/108), augmentation/mastopexy (7.1%, 2/28), brachioplasty (16.7%, 2/12), breast augmentation (0%, 0/58), breast reduction (0%, 0/7), brow lift (0%, 0/27), capsulectomy (0%, 0/7), circumferential abdominoplasty (50%, 3/6), implant exchange (0%, 0/23), otoplasty (0%, 0/2), lower blepharoplasty (2.2%, 1/45), liposuction (7.2%) total complication rate with 6.4% minor complications (7/110) and 0.9% major complications (1/110), mastopexy (7.7%, 2/26), medial thigh lift (22.2%, 2/9), neck lift (5.9%, 1/17), rhinoplasty (0%, 0/7), rhytidectomy (6.7%, 3/45), and upper blepharoplasty (2.4%, 1/42) (Table 1).

Overall revision rate for major procedures was 12.8% (n = 74). Revision rates for each individual major procedure were as follows: abdominoplasty (25.9%, 28/108), augmentation/mastopexy (32.1%, 9/28), brachioplasty (25%, 3/12), breast augmentation (8.6%, 5/58), breast reduction (28.6%, 2/7), brow lift (3.7%, 1/27), capsulectomy (0%, 0/7), circumferential abdominoplasty (0%, 0/6), implant exchange (0%, 0/23), otoplasty (50%, 1/2), lower blepharoplasty (8.9%, 4/45), liposuction (7.3%, 8/110), mastopexy (7.7%, 2/26), medial thigh lift (11.1%, 1/9), neck lift (35.3%, 6/17), rhinoplasty (0%, 0/7), rhytidectomy (6.7%, 3/45), and upper blepharoplasty (2.4%, 1/42) (Table 2).

There was a 77% response rate (20/26) from our past chief residents in our 18 question electronic survey. One hundred percent of respondents reported that the chief resident clinic positively affected their residency education and future practice. In addition, all respondents said that the presence of a chief aesthetic clinic would significantly impact their choice of a residency program if reapplying to plastic surgery. One hundred percent reported adequate attending supervision, and 95% felt their cochief positively affected their clinic experience. Ninety percent of respondents felt *very comfortable* performing facelifts, body contouring procedures, and aesthetic breast surgery

**TABLE 1.** Complication Rates

| Surgery | Number Performed | Minor Complications*, % | Major Complications† | Comparison Complication Rates, % |
|---|---|---|---|---|
| Brow lift | 27 | 0 | 0 | 20[4] |
| Blepharoplasty (upper and lower) | 87 | 4.6 | 0 | 15.8–19.8[5,6] |
| Rhinoplasty | 7 | 0 | 0 | 4.6–10.5[7] |
| Otoplasty | 2 | 0 | 0 | 14–16.6[8–10] |
| Rhytidectomy | 45 | 6.7 | 0 | 6.2–26[11,12] |
| Neck lift | 17 | 5.9 | 0 | 2–24.8[13,14] |
| Breast augmentation | 58 | 0 | 0 | 39.1–64.2[15–18] |
| Mastopexy | 26 | 7.7 | 0 | 16.1[19] |
| Augmentation/mastopexy | 28 | 7.1 | 0 | 8.8–13.1[20,21] |
| Breast reduction | 7 | 0 | 0 | 39.1–64.2[22] |
| Brachioplasty | 12 | 16.7 | 0 | 25–62.5[23,24] |
| Liposuction | 110 | 6.4 | 0.9 | 1.5–9[25,26] |
| Abdominoplasty | 108 | 11 | 0 | 18–42[27–33] |

Major and minor complication rates for procedures performed in our chief resident clinic over the past 13 years. Common complication rates specific to each procedure are provided for comparison.

*Minor complications classified as hematoma, seroma, wound dehiscence, local tissue necrosis, implant rupture, infection, and hypertrophic scars.

†Major complications classified as pulmonary embolism, myocardial infarction, cerebrovascular accident, shock, and death.

(augmentation mammoplasty, mastopexy, and breast reduction), whereas 75% felt *comfortable* (45%) to *very comfortable* (30%) with performing a cosmetic rhinoplasty. No respondents completed a cosmetic fellowship, and 60% stated that their positive experience with the chief clinic contributed to their decision not to pursue a cosmetic fellowship (Table 3).

## DISCUSSION

Aesthetic surgery is an important component of residency training, but many still feel unprepared when transitioning into practice. A 2008 survey by Morrison et al[41] involving 64% of program directors and 33% of senior residents showed that 49% of residents were not satisfied with their cosmetic training and 36% desired further cosmetic training during residency. There has been a trend among residency programs towards implementing these clinics into their curriculum. A 1996 article by Linder et al[42] showed that chief cosmetic clinics were established in only 48.4% of plastic surgery programs, whereas a more recent 2010 study by Neaman et al[43] revealed that 71.3% had a chief resident clinic with 43.8% of those programs reporting 100% of the procedures performed in their chief clinics were cosmetic in nature. With several papers supporting the safety and efficacy of chief resident clinics, they should be a standard component of training.

**TABLE 2.** Revision Rates

| Surgery | Number Performed | Revisions, % | Comparison Revision Rates, % |
|---|---|---|---|
| Brow | 27 | 3.7 | 2[4] |
| Blepharoplasty (upper and lower) | 87 | 5.7 | 3.7–15.8[5,6] |
| Rhinoplasty | 7 | 0 | 4–15.7[7,34] |
| Otoplasty | 2 | 50 | 6.5–24[8–10,35] |
| Rhytidectomy | 45 | 6.7 | 2–9[11] |
| Neck lift | 17 | 35.3 | 5–21.4[36,37] |
| Breast augmentation | 58 | 8.6 | 1.6–4[16,17] |
| Mastopexy | 26 | 7.7 | 8.6[19] |
| Augmentation/mastopexy | 28 | 32.1 | 5.4[19] |
| Breast reduction | 7 | 28.6 | 13–43[38,39] |
| Brachioplasty | 12 | 25 | 12.5–22.9[23,24] |
| Liposuction | 110 | 7.3 | 6[40] |
| Abdominoplasty | 108 | 25.9 | 24–39[27,28,33] |

Revision rates for procedures performed in our chief resident clinic over the past 13 years. Common revision rates specific to each procedure are provided for comparison.

The chief resident clinic at Wake Forest was established 24 years ago to give hands-on experience in treating the aesthetic patient while allowing appropriate supervision and guidance from faculty during this learning process. Our supervising physicians have well established reconstructive and aesthetic practices including weekly protected cosmetic clinic and surgery days. The clinic structure remains similar to that described in the previous outcomes study performed at our institution. In brief, the 2 chief residents have 1 day per week dedicated to their aesthetic clinic with time split equally for clinic and in the operating room. The residents work together in every step from clinical evaluation and preoperative planning to operative treatment and postoperative care. This allows both residents to share their clinical knowledge and operative skills, and our survey responses suggest that this collaboration has a positive effect on aesthetic surgery education. The patent is evaluated by both chief residents, and their operative plan is discussed along with preoperative photographs at a weekly conference where feedback from all of the attending physicians is provided and a final surgical plan is decided upon. The structure and function of both the decision-making and the operative experience of this clinic are explained to patients in detail, and the patients must express full understanding of this before proceeding with treatment. The procedure is then performed in a American Association for Accreditation of Ambulatory Surgery Facilities-certified operating room in our plastic surgery clinic using intravenous sedation with the aid of a certified nurse anesthetist and a supervising attending from our institution is readily available when requested for intraoperative input. Surgical follow-up is procedure specific and is performed by chief residents with an attending physician readily available if needed. Our patients received the same level of confidentiality as would be expected for any aesthetic procedure, and measures are currently taken in the electronic medical record to increase the privacy of the cosmetic clinic encounters.

**TABLE 3.** Chief Cosmetic Clinic Survey Results

| | Very Negatively | Negatively | Neutral | Positively | Very Positively |
|---|---|---|---|---|---|
| How would you rate your experience in chief clinic? | 0% | 0% | 0% | 15% | 85% |
| How much independence did you feel in surgical decision making? | 0% | 0% | 0% | 15% | 85% |
| How much independence did you feel in clinical decision making? | 0% | 0% | 0% | 10% | 90% |
| How did the level of independence impact your experience? | 0% | 0% | 0% | 15% | 85% |
| How do you feel that your experience in chief clinic affected your residency? | 0% | 0% | 0% | 10% | 90% |
| How do you feel that your cosmetic experience was affected? | 0% | 0% | 5% | 15% | 80% |
| How do you feel that your reconstructive experience was affected? | 0% | 0% | 40% | 40% | 20% |
| How did having a cochief impact your experience on chief clinic? | 0% | 5% | 10% | 50% | 35% |
| How do you feel the chief clinic affected your first years of practice? | 0% | 0% | 5% | 45% | 50% |
| If asked to reapply now to residency, how would a chief cosmetic clinic affect your decision? | 0% | 0% | 5% | 15% | 80% |
| When you graduated, how would you rank your level of confidence in performing the following independently? (1 least confident, 5 most confident) | 1 | 2 | 3 | 4 | 5 |
| Rhinoplasty | 0% | 25% | 45% | 20% | 10% |
| Facelift | 0% | 0% | 20% | 30% | 50% |
| Body contouring | 0% | 10% | 5% | 35% | 50% |
| Breast surgery | 0% | 5% | 5% | 40% | 50% |

| How appropriate was the amount of supervision in chief cosmetic clinic? | Response | What percentage of your current practice volume is comprised of aesthetic surgery? | Response | How many years have you been in practice? | Response |
|---|---|---|---|---|---|
| Much too small | 0% | <10 | 30% | 1–5 y | 40% |
| Too small | 0% | 10%–25% | 5% | 6–10 y | 35% |
| Neutral | 0% | 26%–50% | 15% | 11–15 y | 25% |
| Almost enough | 15% | 51%–75% | 30% | 16–20 y | 0% |
| Adequate | 85% | >75% | 20% | | |

| | Yes | No |
|---|---|---|
| Did you pursue a fellowship in aesthetic surgery? | 0% | 100% |
| If not, did your experience in a chief cosmetic clinic contribute to this decision? | 60% | 40% |

Our survey was distributed to prior chief residents over the past 13 years. Of the 26 residents which the survey was sent to, 20 responded (77% response rate).

Our study showed a 6% minor complication rate, 0.2% major complication rate, and 13.8% revision rate with major cosmetic procedures, which is comparable with previous chief clinic studies.[44,45] Pu et al[46] presented a large series of 482 patients and 805 procedures in their resident clinic over a 10-year period and had a revision rate of 3.1% with no litigation brought against any residents or attending surgeons, showing that a resident run chief clinic can also be safe from a medicolegal standpoint in addition to providing good patient care. Our results also support that a chief resident aesthetic clinic can offer safe and acceptable care that is mutually beneficial for the patient and resident surgeon. Our clinic continues to have comparable complication and revision rates to those published in the literature.[4–40,47–60]

Admittedly, it is difficult to draw large conclusions from procedures that are infrequently performed in our clinic or to accurately compare complication and revision rates of procedures with such a wide array of techniques. This fact along with variable definitions in the literature for what defines a *minor* versus *major* complication likely owes to the wide range we see between studies discussing the same procedure (eg, 6%–26% range in complication rate for rhytidectomy and 13%–43% revision rate in breast reduction). Another inherent flaw with comparison of complication and revision rates to other studies is the lack of standardization of patient population with a wide array of demographics and comorbidities in both our study and those in the literature. In addition, we have used our low revision rates as a benchmark of patient satisfaction, as a higher rate of revision would likely be an indirect measure of low satisfaction. In addition, many of our patients have undergone several procedures over many years in our clinic, which would suggest high satisfaction with the chief clinic experience. However, a more direct measure of patient satisfaction would be a postoperative feedback survey, but this has not been a standardized part of our postoperative follow-up and therefore was not possible in this retrospective review. The implementation of a more direct outcome measure for

patient satisfaction would allow us to continually reevaluate our clinic to maximize patient experience and would serve as a strong addition to future studies.

With a higher patient population than that of our previous study, we did experience 1 major complication of a deep vein thrombosis/pulmonary embolism (PE) after a liposuction procedure. This patient was treated with postoperative therapeutic lovenox with no further complications. Pulmonary embolism after a liposuction procedure occurs in approximately 1 in 1750 to 1 in 2210 patients. The 2000 census survey performed by Grazer and de Jong,[61] which reviewed 496,245 lipoplasties, showed that liposuction itself carries a mortality rate of 1 in 5224 and PE is the leading cause of mortality accounting for 23.4% of deaths above visceral perforation (14.6% of deaths) and complications of anesthesia (10%). In addition, a literature review of 1316 lipoabdominoplasty patients by Levesque et al[62] in 2013 showed 0.6% deep vein thrombosis and 0.3% PE rate. This illustrates the importance of close postoperative follow-up even when dealing with outpatient cosmetic procedures. In addition, this example shows a patient who underwent a major complication that was subsequently diagnosed and successfully treated by our chief residents, which further illustrates that a safe environment both intraoperative and perioperative can exist in a chief resident clinic setting with appropriate supervision.

Our survey results indicate that a chief resident clinic has an important contribution to education in cosmetic surgery. The majority of our residents feel very comfortable with the most commonly performed cosmetic procedures, with over 90% endorsing high confidence levels in facelifts, body contouring, and aesthetic breast surgery. Seventy-five percent of our residents were comfortable with rhinoplasty when they finished residency. This was consistent with Morrison et al[41] who showed that this procedure has consistently been shown to be an area of low confidence among residence, with 70% of residents citing rhinoplasty as an area in which they desired further training. With this in mind, residents with a particular interest in advanced rhinoplasty cases (eg, revision rhinoplasties) should consider performing more of these cases in their chief clinics or pursuing an aesthetic fellowship with emphasis in rhinoplasty. Our survey included a high response rate (77%, n = 20) of the chief residents over the past 13 years. Overall, it suggests that a chief resident clinic not only provides a valuable addition to cosmetic training and that the experience may help circumvent the need for aesthetic fellowship.

## CONCLUSIONS

Chief resident clinics can provide results with acceptable complication and revision rates that fall within the acceptable ranges in the literature. In addition, it provides a valuable experience that leaves residents with high comfort levels in performing key procedures in aesthetic surgery.

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