information was gathered about the participants. No question was asked regarding the area of medicine the students were interested in. Having such a question may have offered more information about those who responded compared with those who did not decide to participate. However, if such a question was asked, it could also induce biased assumptions about the respondents. Another difficulty we encountered was the time of the year in which the survey was distributed. More schools and students may have agreed to participate in the survey if it had been distributed earlier in the school year. Last, it should be stated that using different terms for the various specialists mentioned in the study would have most likely led to different results. For example, if the title "facial plastic surgeon" or "otolaryngologist–head and neck surgeon" was used alone instead of being combined, it can be assumed that the responses would have been different than those we received. The title "facial plastic/ENT surgeon" was originally used in the study by Rosenthal et al,[1] and we decided to include this title as well in an effort to provide continuity for comparing our results with those of previous studies.

In conclusion, this study suggests that medical students view multiple specialists as qualified to perform aesthetic and reconstructive facial surgery. Most importantly, this study suggests that the facial plastic and reconstructive surgeon is perceived as most qualified to perform multiple aesthetic and reconstructive facial procedures when being compared to other specialists. In order for the facial plastic and reconstructive surgeon to maintain its positive perception among medical students it is important for otolaryngology–head and neck programs to incorporate facial plastic and reconstructive surgery education into their medical student curriculums. The plastic surgery literature has demonstrated positive results from similar endeavors. Vallino and Brown[5] and Kim et al[3] demonstrated that exposure to plastic surgery in medical school increased the overall knowledge and the breadth of the specialty. The same idea could be applied to otolaryngology–head and neck surgery programs across the country by incorporating facial plastic and reconstructive surgery education within their medical student rotation curriculums.

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Evolution in Nasal Tip Contouring Techniques: A 10-Year Evaluation and Analysis

To our knowledge, there has been no formal statistical evaluation of the trends of nasal tip management in rhinoplasty. Our first objective was to evaluate the changing trends in septorhinoplasty techniques for nasal tip contouring, within a single-surgeon, private facial plastic surgery practice. Our second goal was to determine if this change in techniques has led to improvement in outcomes.

Methods. We performed a retrospective medical chart review consisting of 2 groups of 50 consecutive patients who had undergone rhinoplasty. The 2 groups spanned a 10-year period, one from 1999 and the other from 2008. The study took place at a private facial plastic surgery practice with a focus on rhinoplasty, recognized as a center for revision rhinoplasty referral, in a major metropolitan area. Data collection included patient demographics and types of tip-plasty maneuvers performed. These techniques were categorized as either (1) reductive maneuvers or (2) stabilizing and strengthening maneuvers. The usage of the maneuvers was compared between the 2 patient groups using the χ^2 test of association and Fisher exact test (where warranted by small sample size). The outcome measure was revision rate used as a surrogate measure for surgical success.

Results. There was no statistical difference between the groups in terms of age ($P = .69$), sex ($P > .99$), or percentage of primary vs revision operations ($P = .51$). The mean age of the patients was 32.5 years (range, 15-70 years) in 1999, and 31.5 years (range, 10-60 years) in 2008.

The nasal tip contouring maneuvers evaluated in this study were classified as either *reductive* or *stabilizing and*

Table. Classification of Nasal Tip Contouring Maneuvers

Stabilizing and Strengthening	Reductive
Cartilage overlay techniques	Excisional techniques
Lateral crural overlay	Cartilage
Intermediate crural overlay	Cephalic trim
Medial crural overlay	Medial crural excision
Suture techniques	Lateral crural excision
Interdomal suture	Caudal septal shave
Intradomal suture	Soft tissue
Grafting techniques	Alar base reduction
Structural	Alar margin skin excision
Lower lateral crural strut graft	Membranous septal excision
Columellar strut graft	Weakening techniques
Lower lateral crural batten graft	Release
Caudal septal extension graft	Lateral crural release
Contour	Medial crural release
Supratip graft	Scoring
Tip graft	Lobule scoring
Infratip graft	Medial crural scoring
Combination	
Alar margin graft	
Columellar plumping graft	
Sill graft	

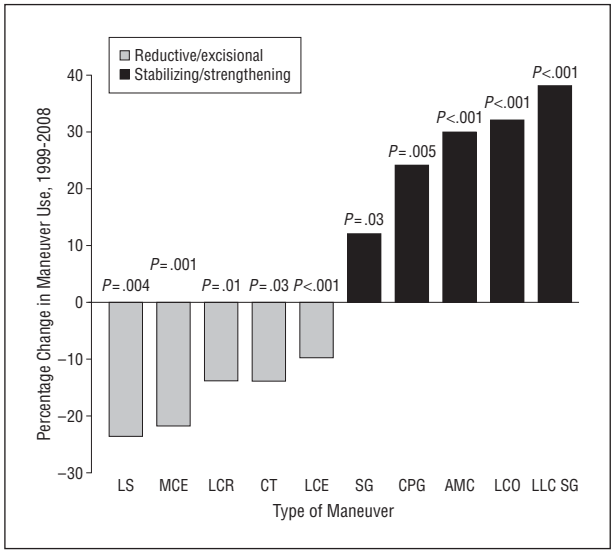

Figure. Changing trends in nasal tip contouring techniques. The use of several reductive and excisional maneuvers diminished significantly in use over the 10-year period (red), whereas the use of other stabilizing and strengthening techniques increased significantly in use (blue). AMG indicates alar margin graft; CGP, columellar plumping graft; CT, cephalic trim; LCE, lateral crural excision; LCO, later crural overlay; LCR, lateral crural release; LLC SG, lower lateral crural strut graft; LS, lobule scoring; MCE, medial crural excision; SG, supratip graft.

strengthening and are summarized in the **Table**. Of the tip-plasty maneuvers deemed to be reductive, there was a statistically significant decrease in medial crural excision ($P = .001$), lobule scoring ($P = .004$), lateral crural release ($P = .01$), and cephalic trim ($P = .03$), with no change in the remaining techniques. Of the tip-plasty maneuvers deemed to be stabilizing and strengthening, a statistically significant increase was noted in the usage of lower lateral crural strut grafts ($P < .001$), alar margin grafts ($P < .001$), lateral crural overlay ($P < .001$), columellar plumping grafts ($P = .005$), and supratip grafts ($P = .003$), with no change seen in the use of the remaining stabilizing techniques. There were no reductive techniques that were increasingly used, and no stabilizing techniques with diminished use over the 10-year time period. This substantial shift in tip-plasty techniques is demonstrated in the **Figure**. Although there was a decrease in the rate of revision rhinoplasty, this decrease was not statistically significant (3 vs 1; $P = .62$).

Comment. *Reductive Maneuvers*. The reductive procedures can be divided into 2 subcategories: excisional techniques and weakening techniques. The excisional techniques can involve cartilage (cephalic trim, medial crural excision, lateral crural excision, and caudal septal shave) or soft tissue (alar base reduction, alar margin skin excision, and membranous septal excision).[1] The cartilage excisional techniques are destabilizing to the underlying skeletal support, whereas the soft-tissue excisions tend only to contour or sculpt the surface. The results demonstrate that most of the cartilage excisional techniques decreased over the evaluation period, whereas there was no change in the soft-tissue excisional techniques.

The weakening techniques can involve release (lateral crural release and medial crural release) or scoring (lobule scoring, medial crural scoring, and lateral crural scoring). Both types of weakening procedures were either not performed routinely in the early cohort (lateral crural scoring, medial crural scoring, medial crural release) or had a statistically significant decrease over the evaluation period (lobule scoring and lateral crural release).

Stabilizing and Strengthening Maneuvers. The subset of maneuvers classified as stabilizing and strengthening share the characteristic of not reducing or excising tissue. They can be categorized as cartilage overlay techniques (lateral crural overlay, intermediate crural overlay, and medial crural overlay), suture techniques (interdomal and intradomal), structural grafting techniques (lower lateral crural strut graft, columellar strut graft, lower lateral crural batten graft, and caudal septal extension graft), contour grafting techniques (supratip graft, tip graft, and infratip graft), and combination grafting techniques (alar margin graft, columellar plumping graft, and sill graft). Although the cartilage overlay techniques involve a division perpendicular to the long axis of the alar cartilage, the 2 flaps are overlapped, creating a double layer that is stabilized with sutures.[2,3] This resultant dual layer is stronger than the initial single layer and resists buckling.[4] The suture techniques not only avoid cartilage excision but also augment stiffness of the cartilage. The structural grafting techniques increase the ability of the nasal tip skeleton to resist the contractile forces of healing and the tendency of the nose to weaken with age. The remaining grafts share the quality of adding bulk and varying degrees of structural stability. The data analysis demonstrates a statistically significant increase in some of the maneuvers, without any decrease in any of the maneuvers in this category.

Evolution in Practice. Our objective was to determine if the changing philosophy of rhinoplasty—from reductive to stabilizing and strengthening techniques—led to improved outcomes by using revision rates as a surrogate marker of success. The analysis demonstrates a shift in the techniques within this practice that parallels the

shift in the rhinoplasty literature. However, the decrease in revision rates between the 2 cohorts in this study was not significant.

Certainly, it is difficult to draw clear conclusions from this observation. First, this is an evaluation of a single-surgeon practice and therefore is subject to the associated biases. Second, the senior author (P.A.A.), who was the primary surgeon for all of the rhinoplasties, was already using structural strengthening techniques (eg, columellar strut) in the early cohort; therefore, there is cross-contamination between the 2 groups.

As rhinoplasty surgeons progress through their career, they are often presented with more difficult cases and an increasing proportion of revision cases. It is reasonable to assume that patient expectations are higher for an experienced surgeon as opposed to a more novice one. This combination of increased case complexity and increasingly discriminating patients can potentially counter the improving skill of an experienced surgeon, leading to a fairly stable revision rate of 5% to 15%.[5]

In the case of an expert surgeon who would tend to accept more challenging cases as his career progressed, and against the backdrop of a clientele that is becoming increasingly demanding as access to information educates their expectations, one might expect that revision rates should not decrease, and might even increase, for the senior surgeon in his later cohort. But this was not the case. Instead, the escalating complexity of his caseload was paralleled by his increasing usage of stabilizing and strengthening techniques, and his revision rates decreased; perhaps this highlights the effectiveness of these maneuvers in controlling revision rates.

In conclusion, we report the first study, to our knowledge, to statistically evaluate the anecdotal notion of a shift in the practice of rhinoplasty. Congruous with the overall evolution of the philosophy of rhinoplasty apparent in the literature, the results of this study demonstrate a decrease in reductive techniques with a concurrent increase in stabilizing and strengthening techniques. This trend may contribute to reduced revision rates, particularly in the setting of complex, second-attempt rhinoplasties.

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