Measured Gain in Projection With the Extended Columellar Strut-Tip Graft in Endonasal Rhinoplasty

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**Importance:** The extended columellar strut-tip graft was designed to improve nasal tip projection and tip definition in patients undergoing rhinoplasty.

**Objective:** To determine whether the extended columellar tip graft leads to a true and measurable increase in nasal tip projection or simply gives the illusion of an increase in projection.

**Design:** Retrospective case review. The mean time of follow-up photographs was 32 months after surgery (range, 8 months to 10 years).

**Participants:** The study population comprised 15 patients who underwent primary or revision rhinoplasty during the last 10 years.

**Intervention:** Primary or revision rhinoplasty.

**Main Outcome Measure:** The outcome measure was the long-term gain in nasal tip projection. Preoperative and postoperative images were cropped and sized equally for accurate comparison. All measurements were made from the alar-facial crease to the tip defining point.

**Results:** In all 15 patients, an increase in tip projection was obtained. The mean increase in projection was 19% compared with the preoperative projection. After applying a paired t test for analysis, there was a statistically significant increase in nasal projection ($P < .05$).

**Conclusions and Relevance:** The extended columellar strut-tip graft effectively corrected poor nasal tip projection. The effect is maintained years later. The extended columellar strut-tip graft is an excellent choice in endonasal rhinoplasty to improve poor tip projection and definition.

**Level of Evidence:** 4.

deployed as the final surgical maneuver after dome suturing when the surgeon deems that tip projection and definition are still inadequate. Therefore, the graft is usually placed as the final step of the operation.

Although there is a perceived gain in nasal tip projection, there has been no formal measurement of it. When reviewing preoperative and postoperative photographs of patients who had the ECSTG placed, one may detect an improvement in projection. Our objective was to determine whether the result was due to an actual increase in projection from the alar-facial plane or merely the illusion of a gain in projection. Furthermore, we wanted to determine whether the graft provided a long-term increase in projection. Our hypothesis was that the ECSTG yields a measurable increase in projection of the nasal tip from the alar-facial plane, which provides adequate support and projection years later.

**METHODS**

This is an institutional review board–approved retrospective study of 15 patients, both male and female, of varied race/ethnicity, who, during the last 10 years, underwent endonasal rhinoplasty with placement of the ECSTG and had long-term follow-up photographs available for measurement. All patients signed a written informed consent for photography and use of the images, which was obtained by the office of the senior author. Individuals exhibited a poorly projected nasal tip and amorphous, ill-defined tip features. Those individuals who agreed with the surgical plan and with the intended aesthetic results had a graft placed at the time of rhinoplasty to correct the deformity.

All operations were performed by the senior author (N.J.P.).

As described in specific detail in the initial publication, autologous septal cartilage was harvested via a hemitransfixion incision in a quantity sufficient for the graft. The graft was custom fashioned with a scalpel blade into the shape and dimensions necessary to achieve the desired projection and definition. Because the graft is fashioned custom for each patient’s particular needs, the length of the graft is determined by measuring between the base of the columella and the newly desired tip position. The graft is always made slightly larger because it can be trimmed if necessary. The overall shape of the triangle is determined by the length and width of the columella. The width (flare) of the base of the triangle is determined by the width of the infratip lobule and the nasal tip. The amount of projection the graft will deliver is modified from “more” to “less” by gently shaving the base of the triangle. A thinner graft will deliver less projection than a thicker one. The final dimensions of the graft range from 2 to 3 cm in length.

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Abbreviations: Pre-op, preoperative; Post-op, postoperative.

*The number of years of follow-up is included in the Table. All 15 patients achieved a gain in projection. The overall mean gain in projection was 19%, which was a statistically significant increase (P < .05).*

Figure 1. Shape and placement of the extended columellar strut-tip graft (ECSTG). A, Fashioned from septal cartilage, this is the shape of the ECSTG. B, This is the approximate placement area for the ECSTG. C, Endonasal placement of the ECSTG. It is placed in a precise pocket immediately before the end of the case, before the incision is closed.

**Table.*** Measured Projection of Each Patient Before and After Surgery*†**

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length and 8 to 10 mm in width. Figure 1A depicts graft after contouring. A recipient pocket was created between the medial crura, just above the anterior nasal spine to the infralobular tip and to the domes. Figure 1B depicts the approximate location of graft placement. The graft was then placed into the pocket. Its position was reassessed, and any final adjustments were made to optimize projection and definition. Figure 1C shows the graft being placed as the last major maneuver in this operation.

Preoperative and postoperative photographs of patients were analyzed. While intermittent postoperative photographs were taken, the postoperative photographs analyzed were taken at a mean of 32 months (2.7 years). The follow-up ranged from 8 months to 10 years. Digital images were available for review using a Macintosh computer and iPhoto software (Apple Inc). The preoperative and postoperative images were then cropped and sized equally for accurate comparison of distances between photographs of the same patient. The senior author performed all measurements. The results were recorded and entered into a Microsoft Excel spreadsheet (Microsoft Corp) for analysis. Using the measure tool in iPhoto, we measured the distance from the alar-facial crease to the tip defining point with digital increments to 0.5 mm. Owing to limitations of standardizing distances between the different patients,
the measured distance can only be accurately compared between the same patient. Because a millimeter measurement cannot be calibrated on photographs, this represents a unit used to compare faces of the same size on the same patient, rather than representing a true measured millimeter. Thus, a percentage change from preoperative to postoperative was calculated and is the actual change in projection, not the measured change in millimeters. A paired t test was used for statistical analysis.

In the 15 patients, the mean increase in projection was 19% with respect to the preoperative projection distance (95% CI, 14%-22%) (Table). After applying a paired t test for analysis, this difference of 19% reached statistical significance (P < .05). The largest percentage gain (38%) was in

Figure 3. Preoperative and postoperative photographs of a patient who underwent placement of an extended columnar strut-tip graft as part of her rhinoplasty. Images A, C, E, G, I, and K are preoperative photographs. Images B, D, F, H, J, and L are postoperative. Postoperative photographs were taken at 1 year after surgery.
a patient whose measured postoperative photograph was taken 5 years after her surgery. However, there was no correlation of percentage gain with follow-up time. 

**Figure 2** depicts preoperative and postoperative photographs of a patient who underwent primary rhinoplasty that included an ECSTG. The included postoperative photographs were taken 2 years after her surgery. On the profile view, the increased projection is evident. She also benefited from supratip and dorsal hump reduction.

**Figure 3** depicts preoperative and postoperative photographs of another patient who underwent primary rhinoplasty that included an ECSTG. The included postoperative photographs were taken 1 year after her surgery. This patient had a very flattened tip which improved with the ECSTG.

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**COMMENT**

The ECSTG is a versatile and powerful graft that improves and maintains nasal tip projection. In addition, the ECSTG is a tool that allows for creating definition and refinement of an amorphous, bland nasal tip. The measured change in projection from the alar-facial crease to the nasal tip defining point is a measurable one. The augmentation is focused mainly from the anterior nostril margin to the tip defining point. By being able to measure the gain in projection, one may conclude that there is definite increase in projection and not just the illusion of change. Furthermore, the finding that the gain in projection was maintained 5 and 10 years after surgery in this study should instill confidence that the ECSTG is able to deliver an increase in projection years later.

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**REFERENCES**