virtual rhinoplasty for each patient including: lowering the dorsum, straightening the upper and middle vault, infracture, medialization of the alar base, columellar lengthening/straightening, superior rotation of the depressed lower lateral cartilage, tip refinement, and alteration of nasal tip rotation/projection. Completed surgical models are comprised of a facial moulage defined by the superior border of the eyebrows, the inferior border of the mandible and the lateral border of each orbit. The 3D reconstructions from before and after virtual surgery planning are manufactured in-house by a departmentally-owned 3D printer (Ultimaker 3+ Extended) and white polylactic acid (PLA) filament (Batch #: 15099905). Upon completion, these models are sterilized according to a low temperature protocol (121°C for 60 minutes followed by 30 minutes dry cycle) set forth by the manufacturer and brought into the operating room, where they are available to the surgeon throughout the procedure.

RESULTS/COMPLICATIONS: Twelve patients have undergone rhinoplasty using virtual surgical planning and departmentally manufactured, sterilizable, patient-specific 3D printed models of preoperative and planned “postoperative” facial/nasal appearance. Four patients underwent cosmetic rhinoplasty, five underwent correction of cleft nasal deformity, and three underwent rhinoplasty to correct nasal deviation associated with trauma. Digital models were available to the surgeon preoperatively for review of treatment plan with the patient and confirmation of operative approach. Each target model required 4 hours average of digital preparation/sculpting time. Manufacturing averaged 22 hours of 3D printing time. Approximately 60 grams of PLA are used in the production of each model, and the materials cost of each pair of pre- and post-operative models was $4.00.

CONCLUSION: We present a protocol for virtual surgical planning and in-house manufacturing of sterilizable, scaled, patient-specific, 3D printed rhinoplasty models which can be affordably reproduced within other academic centers to assist in patient education, preoperative planning, and technical execution of this procedure.

REFERENCES:
1. van Heerbeek N, Ingels KJ, van Loon B, Plooij JM, Berge SJ. Three dimensional measurement of rhinoplasty results. Rhinology 2009;47:121–5.
2. Choi YD, Kim Y, Park E. Patient-Specific Augmentation Rhinoplasty Using a Three-Dimensional Simulation Program and Three-Dimensional Printing. Aesthet Surg J 2017;37:988–98.
3. Heppt WJ, Godbersen H, Hildebrandt T. An interactive three-dimensional nose model for rhinosurgery. Facial Plast Surg 2013;29:121–6.

Changing Nasal Tip Projection Via Purposeful Manipulation of the Medial Crura: A Surgical Experience with Resecting the “Unresectable”

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GOALS/PURPOSE: A belief exists that dissection and resection of the medial crura should be discouraged to avoid compromise of the tip support. We believe that judicious resection of the columellar portion of the medial crura can be an effective and predictable technique to control or reduce tip projection. This is pertinent in cases of tip overprojection, increased columellar show, or intraoperative findings of significantly buckled medial crura, where this technique allows for greater precision in controlling tip projection. Concern for loss of tip support can be obviated by buttressing the resulting structure with a columellar strut graft. We describe the routine use of dissection and resection of medial crura by the senior author (TAM) and present a brief review of the results.

METHODS/TECHNIQUE:

METHODS: A single institution, retrospective review of all consecutive patients who underwent rhinoplasty with resection of the medial crura by the senior author (TAM) during a single year was conducted.

TECHNIQUE: All rhinoplasties were performed using an open technique. After conservative lateral crura resection in most cases, the nose is opened using a combination of blunt and sharp sub-mucoperichondrial dissection. Septoplasty is performed via a hemitransfixion incision, followed by dorsal rasping. The medial crura are dissected from the soft tissue envelope and the tip is shaped with a routine cephalic trim of the lateral crura and any dome suture maneuvers necessary. The projection of the tip is assessed and the
appropriate (usually 3-5mm) amount of medial crura is resected from the mid-columellar segment. The columellar strut graft is placed and the cut ends of the crura are overlapped and sutured over the strut graft using 5-0 PDS.

**RESULTS/COMPLICATIONS:** Nineteen patients matched inclusion criteria, with a mean age of 39 years old. Six patients (32%) had a history of a prior rhinoplasty procedure. In addition to resection of the medial crura, thirteen patients (68%) also had resection of their lateral crura. All patients underwent a sepal resection and 18 (95%) received a columellar strut. Three (16%) patients had spreader grafts inserted and three (16%) patients had a tip graft placed. There were no complications in this series. Postoperative cosmesis was considered excellent by both patient and surgeon in all cases at mean follow-up of 11 months.

**CONCLUSION:** Manipulation of the medial crura of the lower lateral cartilages is not inherently detrimental to tip support if performed judiciously and reinforced with a columellar strut graft acting as a buttress to the caudal medial crura. This technique is most useful to decrease tip projection or when tip projection is at goal, but domal shaping sutures would increase it and create over-projection. In both scenarios, resecting a portion of the mid-columellar medial crura leads to a predictable decrease in tip projection. We have not encountered any cases of support deficiency postoperatively. We encourage incorporating this technique to address over-projected noses and to prevent over-projection that may result from domal suture techniques.

**Randomized Comparative Study of the Peripalpebral Edema and Ecchymosis Caused By Internal Continuous and External Perforating Osteotomy Procedures in Rhinoplasty**

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**BACKGROUND:** There is a direct relationship between the lateral osteotomy procedures and the edema and the ecchymosis occurring in the postoperative period. These undesirable effects of surgery cause anxiety and dissatisfaction in the operated patient and extends the period in which the individual must abstain from working. Therefore, a technique of osteotomy should not only be precise, reproducible and safe, but should also minimize postoperative sequelae, including ecchymosis and edema. The ideal nasal osteotomy technique remains controversial. The objective of this study is to compare, at the end of the 1st postoperative week, the peripalpebral edema and ecchymosis caused by internal continuous and external perforating osteotomy.

**METHODS:** A randomized prospective longitudinal study was conducted. Inclusion criteria: Rhinomegaly, need for lateral osteotomy defined preoperatively, normal hematological and cardiopulmonary screening tests and signing of the written consent form agreeing with its items following the explanation of the study by the assistant physician. Exclusion criteria for the study: Transoperative need for medial osteotomy, history of use of dermal fillers in the nose, systemic arterial hypertension, combined surgery, the need for septoplasty in conjunction and Diabetes Mellitus. The randomization process occurred by alternate allocation. Each patient was assigned to one of the two groups. In group I patients underwent rhinoplasty with external osteotomy. In group II internal osteotomy was performed. When patients returned for the 1 week review photography was done. The photos were analyzed by two blinded plastic surgeons. In their analysis they rated the degree of edema and ecchymosis utilizing a scale.

**RESULTS:** 63 patients were studied. 22 patients in group I and 41 patients in group II. The characteristics of both groups were comparable. Group II showed statistically significant lower rates compared to Group I reflecting a lower perception of ecchymosis when the external osteotomy was performed. No statistically significant difference between them was found when compared for ecchymosis.

**CONCLUSION:** Internal continuous osteotomy produces more ecchymosis at the end of the initial postoperative week than that of external perforating osteotomy. No difference between the two groups was found in terms of peripalpebral postoperative edema.

**REFERENCES:**
1. Rohrich RJ, Janis JE, Krueger JK, Adams WP. Importance of Lateral Nasal Osteotomy: An External Perforated Approach. In: Gunter JP, Rohrich RJ, Adams WP (eds.), Dallas Rhinoplasty: Nasal Surgery By The