COSMETIC SESSION 2

Pyriform and Paranasal Alterations During Rhinoplasty

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INTRODUCTION: The pyriform anatomy is sometimes underestimated and overlooked during patient evaluation for rhinoplasty. Several methods have been described to address the pyriform area and alter its anatomy. Among these methods are placement of paranasal implants, injectable, fat or cartilage grafting, orthodontic management with or without orthognathic surgery. We propose an objective approach to evaluate and treat pyriform deformities in patients presenting for rhinoplasty.

METHODS: We reviewed 753 rhinoplasty surgeries performed in a single institution over the last 12 years. We retrospectively evaluated the methods used to treat a wide spectrum of pyriform anatomic variations associated with nasal deformities. We propose a classification and a treatment algorithm to evaluate and address pyriform abnormalities.

RESULTS: Class 1 is the abnormality encountered in patients with isolated pyriform deformity. This group of patients would benefit from augmentation with cartilage or fat graft, paranasal implants or injectable in mild cases. Class 2 abnormality is encountered in patients with pyriform deformity in association with other midface skeletal deformities (excluding dental/occlusal deformities). This group of patients would benefit from multiple cartilage grafts with or without fat grafting, multiple or custom designed implants. Class 3 refers to patients with pyriform deformity associated with dental abnormalities; This class is subdivided into type A which includes patients with normal occlusion but abnormal dental inclination. This type would benefit from pyriform augmentation in addition to orthodontic or limited orthognathic surgery. And type B which include patients who have malocclusion in addition to pyriform deficiency. This type would benefit primarily from orthognathic surgery with or without pyriform augmentation.

CONCLUSION: Evaluation of the pyriform anatomy is essential during comprehensive assessment of patients for rhinoplasty. Addressing pyriform deformity significantly improves outcomes and patient satisfaction after rhinoplasty surgery.

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Virtual Rhinoplasty Becomes Reality: Intra-Operative Monitoring with 3D Photography

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PURPOSE: Photography plays an important role in rhinoplasty yet is limited as a true anatomic reference. Three-dimensional photography is becoming increasingly recognized as a superior method for viewing and analyzing the facial contour. Understanding the complex anatomy and subtle changes inherent to rhinoplasty benefit from 3D photography and computer analysis.

METHODS: Patients undergoing rhinoplasty had 3D photographs taken pre-operatively (n=16). A virtually rhinoplasty was simulated during the pre-operative consult (Canfield Vectra H1), and displayed with pre-operative 3D in the operating room for reference. Intra-operative 3D photographs were then captured at one or more of the following: 1. Dorsal hump reduction, 2. Tip modification, 3. Correction of septal deviation, and overlayed with baseline to visualize changes and highlight regions requiring further modification. Immediate post-operative 3D photographs were captured, and families were given the option to view the result.

RESULTS: Interval 3D photographs were most useful to guide dorsal hump reduction and tip rotation. Post-operative 3D-photographs captured the result with minimal swelling. All families wanted to see the 3D photos after surgery and reported they found the experience positive, alleviating their concerns regarding the aesthetic outcome.

CONCLUSION: 3D photography and simulation aligned aesthetic goals and expectations before surgery. Overlay between intra-operative photographs and the simulation highlighted adherence to previously defined aesthetic goals. All patients/families to date reported viewing the immediate 3D post-operative image as a positive experience.
Deep Pyriform Space: Anatomical Clarifications and Clinical Implications

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BACKGROUND: To define the anatomical boundaries, transformation in the aging face and clinical implications of Ristow’s space. We propose a title of deep pyriform space for anatomical continuity.

METHODS: The deep pyriform space was dissected in 12 hemifacial fresh cadaver dissections. Specimens were divided into 3 separate groups. For group 1, dimensions were measured and plaster molds were fashioned to evaluate shape and contour. For group 2, the space was percutaneously injected with dyed hyaluronic acid to examine proximity relationships to adjacent structures. For group 3, the space was pneumatized to evaluate its cephalic extension.

RESULTS: The average dimensions of the deep pyriform space are 1.1 cm x 0.9 cm. It is bounded medially by the depressor septi nasi and cradled laterally and superficially in a “half-moon” shape by the deep medial cheek fat and lip elevators. The angular artery courses on the roof of the space within a septum between the space and deep medial cheek fat. Pneumatization of the space traverses cephalic to the level of the tear trough ligament in a plane deep to the pre-maxillary space.

CONCLUSION: The deep pyriform space is a midface cavity cradled by the pyriform aperture and deep medial cheek compartment. Bony recession of the maxilla with age lends this space as a potential area of deep volumization to support overlying cheek fat and draping lip elevators. The position of the angular artery in the roof of the space allows safe injection on the bone without concern for vascular injury.

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Reduction in Postoperative Rhinoplasty Edema with Time

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INTRODUCTION: The final result of rhinoplasty may be masked for several months following surgery due to postoperative edema; however, no objective evidence supports this time estimate. The purpose of this study is to 3-dimensionally quantify the decrease in post-surgical nasal edema following rhinoplasty over the first postoperative year.

METHODS: This was a retrospective, 3D morphometric study of primary open rhinoplasty patients. Subjects with at least three postoperative 3D images up to one year were included. Patients were excluded for closed or secondary procedures or a history of cleft deformities. Images were assessed using 3D stereophotogrammetry (Vectra) and volumetric analysis (Geomagic). Baseline nasal volume (T0) occurred at the first postoperative visit at 1–2 weeks. All subsequent nasal volume measurements were calculated as a percentage of T0. Data points from all patients were pooled and a 6-point moving average was used to create an inverse function line of best fit.

RESULTS: 40 patients were included, with 146 3D photographs quantified. The equation for the inverse function line of best fit of the 6-point moving average was y = 1.484 (1/x) + 0.844 (R² = 0.85, p<0.01). According to this equation, approximately 66.7% of edema resolves within the first month, 95% within 6 months, and the majority of the remainder (up to 97.5%) resolves within the first year, reaching a plateau of 84.4% of the original postoperative volume.

CONCLUSION: This study provides quantitative evidence to predict decrement of rhinoplasty edema with time, to assist surgeons with managing rhinoplasty patients’ perioperative expectations. 3D morphometric assessment demonstrated a two-thirds decrease in edema at 30 days, with subsequent swelling gradually resolving over the remaining year.

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