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.