

Outcomes in open structure septorhinoplasty

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Abstract. *Outcomes in open structure septorhinoplasty. Objectives:* This study assessed the patient-related outcome measures and complications of post-open structure septorhinoplasty. It also investigated the factors associated with the need for revision surgery.

Methods: We prospectively reviewed the case notes of patients who underwent septorhinoplasty performed by a single rhinologist at our institute between August 2011 and August 2013. Patient satisfaction was assessed using the Rhinoplasty Outcomes Evaluation (ROE) tool.

Results: A total of 120 patients were included with a mean follow-up time of 28.2 months. Eight patients (6.7%) required revision nasal surgery. There was a significant increase in the mean post-operative ROE score of all patients who underwent surgery (19.5 ± 9.41 vs. 68.4 ± 23.7 , $p < 0.001$). The rate of revision surgery was significantly higher in patients with complex surgeries (3/12 vs. 5/108, $p = 0.03$). There were higher rates of nasal tip deformity surgery and augmentation surgery in the revision surgery group compared to the primary surgery group: 8/17 vs. 20/103, $p = 0.03$ for nasal tip and 10/17 vs. 27/103, $p = 0.01$ for augmentation.

Conclusions: Open structure septorhinoplasty significantly increased the ROE score. Our rate of revision surgery, 6.7%, was lower than the average rate of 10%-18% reported in the literature. The rate of revision surgery was higher in cases judged pre-operatively to be more complex.

Introduction

Rhinoplasty is a complex surgical procedure that requires detailed planning, clear communication with the patient to set realistic expectations, and good surgical technique. The literature describes the difficulties in achieving optimal results despite the best-laid plans.¹

Revision rhinoplasty rates are typically between 10%-18%, even for the most experienced facial plastic surgeons.² The reasons for revision surgery include differences in the expectations for the surgery for the surgeon versus the patient, difficult nasal deformity pre-operatively, post-operative nasal trauma, unexpected scar contracture, and poor surgical technique.³⁻⁶

Quantitative assessment of patient-related outcome measures, such as quality of life, is integral in many otorhinolaryngology fields, but only recently has this become important in the field of rhinoplasty surgery.^{7,8} Here we used the Rhinoplasty Outcomes Evaluation (ROE) questionnaire, which

was introduced by Alsarraf.⁸ The ROE has been demonstrated to be reliable and valid, and it measures three quality of life domains: physical, mental and emotional, and social.^{7,9}

The aim of our study was to assess patient-related outcome measures and complications after open structure septorhinoplasty procedures that were performed by the same experienced rhinologist. We also investigated the factors associated with the need for revision surgery.

Materials and methods

This study was approved by the Southend University Hospital NHS Foundation Trust Audit and Clinical Governance Department. All patients who were included in the study provided their informed consent. We prospectively reviewed the case notes of patients who underwent septorhinoplasty performed by a single rhinologist at our institute between August 2011 and August 2013. The following data were recorded: demographics (age,

gender); type of nasal deformity (dorsal deformity, nasal axis deviation, tip deformity); operative information (augmentation, reduction, tip modification, twist surgery, extracorporeal septoplasty); history of previous surgery; complications; and the need for revision surgery.

Patient-related outcome measures were assessed pre-operatively and one year post-operatively using the ROE questionnaire. The ROE is a rhinoplasty-specific outcome measurement with excellent test-retest reliability, internal consistency, and responsiveness to change.² It consists of 6 questions about 3 quality of life domains: physical, mental/emotional, and social. Each question has 5 answers that are ranked from 0 (the most negative answer) to 4 (the most positive answer), and the total score is determined by adding the individual scores, dividing by 24 and multiplying by 100 to obtain a score between 0 and 100.

The statistical analysis and comparisons were carried out using Fisher's exact test, since the cross-tabulations were 2x2 and the cell sizes were small, and the unpaired *t* test (GraphPad Software, USA).¹⁰

Results

During the study period, 158 patients underwent open septorhinoplasty at our institution; all surgeries were performed by the same rhinology consultant. Of these patients, 120 patients (75.9%) returned ROE score questionnaires and were followed up for a minimum of 1 year; all were included in the study.

Of the 120 patients included in the study, 69 were men and 51 were women, and the mean age was 29.2 years (range 15-67 years). The mean follow-up was 28.2 months (range 12-54 months). Seventeen patients (17/120, 14%) had a history of previous surgery, i.e. for these 17 patients, this operation was revision surgery.

The most common type of pre-operative nasal deformity in all patients was nasal axis deviation (86/120, 72%) followed by dorsal hump deformity (58/120, 48%), and tip deformity (28/120, 23%). The most common type of surgery performed in all patients was twist surgery (97/120, 81%) followed by reduction surgery (72/120, 60%), tip refinement surgery (41/120, 34%), augmentation surgery (37/120, 31%), and extracorporeal septoplasty (17/120, 14%) (Figure 1).

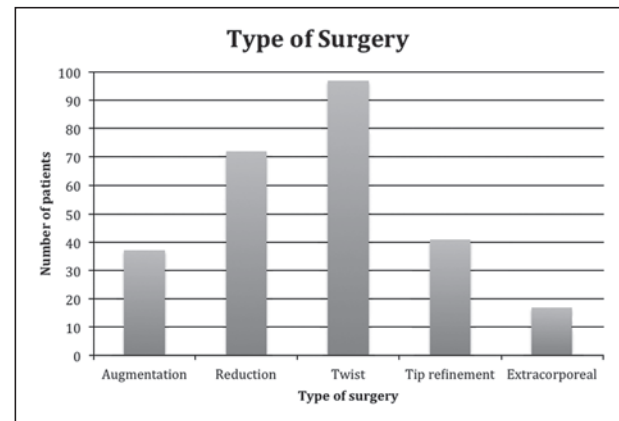


Figure 1

The types of septorhinoplasty surgery performed in the patients (n=120) in this study.

The most common complication was residual deformity (7/120, 5.8%) followed by scar deformity (3/120, 2.5%), bleeding (1/120, 0.8%), and infection (1/120, 0.8%). There were no cases of septal perforation. Of the 120 patients who underwent surgery, 8 patients required further revision nasal surgery (8/120, 6.7%).

There was a statistically significant increase in the post-operative ROE scores compared to the pre-operative scores in all patients undergoing surgery (19.5 ± 9.41 pre-operatively vs. 68.4 ± 23.7 post-operatively, $p < 0.001$).

The rate of revision surgery was significantly higher in patients with complex surgeries, i.e. >2 components (3/12 vs. 5/108, $p = 0.03$). There was also a higher rate of revision surgery in patients who had previous surgeries, but this increase was not statistically significant (2/17 vs. 6/103, $p = 0.32$).

We divided the patients into two groups: patients who underwent primary surgery (n=103) and those who underwent revision surgery (n=17). The only variables that were significantly higher in the revision surgery group compared to the primary surgery group were the presence of nasal tip deformity (8/17 vs. 20/103, $p = 0.03$) and augmentation surgery (10/17 vs. 27/103, $p = 0.01$) (Table 1).

Discussion

Septorhinoplasty is a complex surgical procedure, and the results can be unpredictable.¹ Our rate of revision surgery was 6.7%, which compares

Table 1
Comparison of primary open structure septorhinoplasty surgery versus revision surgery

Variable	Primary surgery group (n=103)	Revision surgery group (n=17)	p-value
Nasal axis deviation	76	10	0.25
Dorsal hump deformity	52	6	0.30
Tip deformity	20	8	0.03
Twist surgery	86	11	0.09
Reduction surgery	62	10	1.00
Augmentation surgery	27	10	0.01
Tip refinement surgery	32	9	0.10
Extracorporeal septoplasty	13	4	0.26

favourably with the rate reported in the literature, which ranges from 10%-18%.²

The most common nasal deformity in our study was nasal axis deviation (72%) followed by hump deformity (48%). Cingi *et al.* reported rates of 73% for dorsal hump deformity and 31% for deviated nasal axis.² It is likely that one of the reasons for our higher rate of nasal axis deviation in our patient group was that our centre usually performs septorhinoplasty in patients with a history of nasal trauma or in patients who complain of nasal obstruction secondary to nasal axis deviation.

The literature, particularly studies from South East Asia, reports a high incidence of alloplastic implant-related complications, especially infections.^{11,12} However, in our case series, the most common complication was residual deformity (6%). This is most likely due to the fact that the alloplastic materials that are usually favoured for reconstructive or augmentation surgery are very rarely used at our institution.

In our study, 14% of the patients had a history of previous nasal surgery. This relatively high figure is due to the fact that our consultant rhinologist receives tertiary referrals for revision surgery within the region. We did not find any significant differences in the types of nasal deformities in patients who underwent primary versus revision surgery except for a higher incidence of tip deformity in patients that underwent revision surgery. Some studies report that tip asymmetry and crooked middle third of the nose are the most common deformities in revision rhinoplasty.¹³ We found that augmentation surgery was significantly higher in the revision surgery group as compared to the primary surgery group, which may be because

of the higher rate of saddle nose deformities in the revision surgery group.

The rate of patients requiring revision surgery was significantly higher in the group of patients undergoing complex surgery. This was as expected, as these patients had more complex pre-operative nasal deformities.²

The ROE questionnaire is one of the few validated patient-related outcome measures that has excellent test-retest reliability specifically for rhinoplasty, which is why it was used in this study.^{8,14} Our results demonstrated a statistically significant increase in the post-operative ROE scores regardless of whether the patient had primary rhinoplasty or revision surgery. This is supported in the literature by Alsarraf *et al.*⁷ (mean pre- vs. post-operative score change of 44.5 points) and by Cingi *et al.*² (mean change of 54.1 points).

One limitation of this study was that there might have been selection bias in that patients with a positive post-operative result may have been more likely to respond to our request for participation. Also, it is very difficult to categorise the different components of septorhinoplasty. Therefore, in this study, we arbitrarily determined the different components; this may make our study difficult to standardise or reproduce, making comparisons with other studies difficult.

Conclusion

Open structure septorhinoplasty significantly increased the rhinoplasty outcomes evaluation score. Our rate of revision surgery was lower than the average rate reported in the literature. The rate

of revision surgery was higher in cases judged pre-operatively to be more complex.

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Disclosure policy

The authors declare that there are no conflicts of interest regarding the publication of this paper.

References

1. Aufricht G. Rhinoplasty and the face. *Plast Reconstr Surg.* 1969;43(3):219-230.
2. Cingi C, Eskiizmir G, Cakli H. Comparative analysis of primary and secondary rhinoplasties according to surgeon's perspective, patient satisfaction and quality of life. *Ann Otol Rhinol Laryngol.* 2012;121(5):322-327.
3. Kamer FM, McQuown SA. Revision rhinoplasty. Analysis and treatment. *Arch Otolaryngol Head Neck Surg.* 1998; 114(3):257-266.
4. Farrior EH. Revision rhinoplasty for monographs in facial plastic surgery contemporary rhinoplasty. *Facial Plast Surg.* 1997;13(4):299-308.
5. Bracaglia R, Fortunato R, Gentileschi S. Secondary rhinoplasty. *Aesthetic Plast Surg.* 2005;29(4):230-239.
6. Park CH, Kim IW, Hong SM, Lee JH. Revision rhinoplasty of Asian noses: analysis and treatment. *Arch Otolaryngol Head Neck Surg.* 2009;135(2):146-155.
7. Alsarraf R, Larrabee WF, Anderson S, Murakami CS, Johnson CM. Measuring cosmetic facial plastic surgery outcomes, a pilot study. *Arch Facial Plast Surg.* 2001; 3(3):198-201.
8. Alsarraf R. Outcomes research in facial plastic surgery: a review and new directions. *Aesthetic Plast Surg.* 2000; 24(3):192-197.
9. Meningaud JP, Lantieri L, Bertrand JC. Rhinoplasty: an outcome research. *Plast Reconstr Surg.* 2008;121(1):251-257.
10. Motulsky H. GraphPad Software. Available at: <http://www.graphpad.com/quickcalcs/contingency1.cfm>. Accessed November 22, 2013.
11. Park CH, Kim IW, Hing SM, Lee JH. Revision rhinoplasty of Asian noses: analysis and treatment. *Arch Otolaryngol Head Neck Surg.* 2009;135(2):146-155.
12. Won TB, Jin HR. Revision rhinoplasty in Asians. *Ann Plast Surg.* 2010;65(4):379-384.
13. Yu K, Kim A, Pearlman SJ. Functional and aesthetic concerns of patients seeking revision rhinoplasty. *Arch Facial Plast Surg.* 2010;12(5):291-297.
14. Copas JB, Robin AA. The facial appearance sorting test: and aid to the selection of patients for rhinoplasty. *Br J Plast Surg.* 1989;42(1):65-69.

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