QUALITY OF LIFE CHANGES FOLLOWING THREE-DIMENSIONAL PRINTING OF PROSTHESIS FOR LARGE NASAL SEPTAL PERFORATIONS – OUR EXPERIENCE OF 13 PATIENTS

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Objectives
To assess the clinical outcomes following large nasal septal perforation (NSP) closure using 3-D printing technology for the fabrication of custom-made prosthesis.

Design
Prospective cohort study

Setting
Rhinology clinics at a tertiary referral hospital in Liverpool, United Kingdom.

Participants
Patients diagnosed with nasal septal perforation.

Materials and Methods
Incision
Prospective patients with a diagnosis of symptomatic nasal septal perforation presenting to the rhinology clinics.

Exclusion
Patients with concomitant sino-nasal disorders such as nasal polyposis, CRS, active sino-nasal vasculitis etc.

Main outcome measures
Total SNOT-22, domain (rhinologic, ear/face symptoms, sleep and psychological function) scores and pre- and post-insertion nasal symptoms specific to nasal septal perforation (crusting, epistaxis, whistling) were evaluated.

Statistical analysis
Statistical analysis was performed using the SigmaPlot software package version 12 (Systat Software Inc., CA, U.S.A). One-way ANOVA test was used to compare the SNOT scores or when normality test (Shapiro-Wilk) failed, One-way ANOVA on Ranks test (Kruskal-Wallis) was utilised instead. A p value <0.05 was considered statistically significant.

Results
Of the 45 eligible patients, only 13 (M: F = 9:4) fulfilled the inclusion criteria for this study. The mean age of the 13 patients was 59.5 years. The mean perforation size was 2.99 cm². The mean follow-up period was 550.75 days.

All individual symptoms on the SNOT 22 score had significant reduction after surgery. The perforation specific symptoms had the highest change in symptoms.

The mean pre-operative SNOT 22 score was 42.92 before the prosthesis insertion which dropped to 16.46 after the procedure (p = 0.00070316) (Graph 1). Mean Perforation specific score was 9.92 before and 2 after the procedure (p = 2.333646-05) (Graph 2).

Conclusion
Large septal perforations are quite challenging to manage with conventional techniques and pre-fabricated buttons due to higher chances of extrusion or displacement. Prognosis remains guarded in these cases despite the best efforts for closure. 3-D printing is a new technology finding a place in the management of many conditions across surgical fields. This provides a good alternative to the many other techniques for closure of large NSPs. With accurate sizing and a comfortable fit, patient acceptance and symptom reduction is evident as demonstrated in the results.