Reconstruction of the Nasal Septum Using Perforated and Unperforated Polydioxanone Foil

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Objective: To present our experience of reconstruction of the nasal septum using perforated and unperforated foils, particularly with respect to functional and aesthetic sequelae.

Methods: A retrospective medical record review of a prospectively conducted case series was undertaken of all consecutive patients who underwent septal reconstruction using polydioxanone foil in a 4-year period. Procedures included septorhinoplasty and isolated septoplasty via external and endonasal approaches using corporeal and extracorporeal techniques. The polydioxanone foils were in battens or sheets.

Results: Fifty patients underwent septal reconstruction using unperforated (first 26 patients) or perforated (next 24 patients) polydioxanone foil. Median total postoperative follow-up was 51.5 months (range, 34-60 months) for unperforated foil and 20.5 months (range, 12-31 months) for perforated foil. All the patients were reviewed for assessment of appearance and function. Forty-three patients had satisfactory results, needing no further treatment. Three patients required minor septal or tip revision surgery. Four patients experienced moderate saddling of the dorsum (all involved unperforated polydioxanone foil) and underwent successful revision surgery using auricular cartilage grafts.

Conclusions: Synthetic materials are a useful alternative to autologous tissues during reconstruction of the nasal septum. To our knowledge, we present the largest single-center series of septal reconstructions using unperforated and perforated polydioxanone foils—shown to be useful in the correction of complex septal deformity. However, the unperforated form seems to be associated with a significant risk of postoperative saddling, and we warn against its use in this context. No such complications were observed with the use of thin, 0.15-mm perforated polydioxanone foil, which we exclusively recommend for this application. The use of this implant warrants further evaluation.

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The principal functions of the nasal septum are to provide midline support for the external nose while separating the nasal passages, supporting nasal mucosa, and (in conjunction with other structures) promoting regulated cyclical nasal air flow. Septal deformities may have dramatic cosmetic and functional effects. Hence, the goal of corrective surgery is to produce a straight and intact nasal septum that is structurally solid. This may be challenging, particularly in cases of extreme deformity and after previous surgery or trauma.

A variety of surgical strategies and approaches may be used, but a successful outcome depends on several mandatory operative steps. Deformities are first skeletonized and demonstrated via a closed (endonasal) or open (external) approach. Next, the septum is mobilized appropriately. It may be left largely in situ or, alternatively, removed from the nose (extracorporeal septoplasty). Angulations are then corrected, and the curved or deformed segments are isolated for reconstruction. Finally, the septal components are replaced and stabilized in the nose. This final repositioning and stabilization of the septum is potentially difficult. Fragments of cartilage must be connected meticulously and anchored to key structures in the nose, thereby minimizing the risks of sequelae, such as persistent deformity and saddling. Cartilage fragments may be simply sutured together, but this is often time-consuming, and the resulting combination may not provide sufficient support for the nasal dorsum. Surgery to the tip cartilages or the bony vault is performed where appropriate.

In such situations, a variety of implanted materials (grafts) have been used either to facilitate the connection of septal fragments or to reconstruct deficient...