A Novel Technique to Repair Moderate-Sized Nasoseptal Perforations

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Objectives: To describe a novel technique for closure of moderate-sized nasoseptal perforations and to review the current literature on various techniques for closure of nasoseptal perforations.

Design: Retrospective review.

Setting: Academic research.

Patients: We performed a retrospective review of a successful novel technique that has been used at a facial plastic and reconstructive surgery practice for closure of nasoseptal perforations during 3 years (January 1, 2008, to January 1, 2011).

Main Outcome Measures: Medical records were reviewed to identify patient characteristics, symptoms, causes of nasoseptal perforations, and outcomes, including patient satisfaction and rate of recurrent nasoseptal perforation.

Results: During 3 years at our institution, 7 patients were identified with nasoseptal perforations that had been closed using bilateral mucosal advancement flaps (one inferiorly based flap advanced from the floor of the nose and another superiorly based flap advanced from the lateral nasal wall). The nasoseptal perforations ranged from 0.6 to 1.6 cm. Most patients had excellent outcomes, with resolution of symptoms and no recurrence.

Conclusions: Nasoseptal perforations have traditionally been closed using 2 superiorly based flaps or 2 inferiorly based flaps. We present a novel technique combining both flaps for closure of moderate-sized nasoseptal perforations. This procedure decreases the risk for recurrence of the perforation, necrosis of the flaps, and development of a new perforation.


A TROUBLESOME PROBLEM encountered by otolaryngologists, nasoseptal perforations are reported at a rate of about 1% of their patient population.1 These patients are seen with epistaxis, crusting, congestion, malodorous discharge, whistling, and general discomfort, although up to 39% of patients with nasoseptal perforations may be asymptomatic.1 Nasoseptal perforations occur when the blood supply to the avascular cartilage is cut off on both sides at approximately the same location bilaterally.1 Iatrogenic injury from previous nasal surgery is the most common cause, while trauma, nasal sprays, inhaled drug use, autoimmune diseases, neoplastic disorders, and inflammatory origins are also often causes of nasoseptal perforations.

Numerous techniques have been described for the repair of nasoseptal perforations, including those that use only local mucosal flaps and those that use local mucosal flaps with interposition grafts. We describe a novel technique for closure of moderate-sized nasoseptal perforations using bilateral mucosal advancement flaps (one inferiorly based flap advanced from the floor of the nose and another superiorly based flap advanced from the lateral nasal wall).

METHODS

STUDY DESIGN

After approval for the study was obtained from the institutional review board at Baylor College of Medicine, the medical records were reviewed of all the patients who had undergone repair of nasoseptal perforations using the described technique by one of us (K.O.) between January 1, 2008, and January 1, 2011. Causes of nasoseptal perforations and outcomes of the repair were recorded.

SURGICAL TECHNIQUE

For repair of a nasoseptal perforation, tissues are injected with a combination of lidocaine hydrochloride, 1%, and 1:100 000 epinephrine bitartrate, followed by decongestion with...
oxymetazoline hydrochloride–soaked pledgets. The nasoseptal perforation is well visualized using a 0° endoscope. A hemitransfixion incision is made on the left side, and submucoperichondrial flaps are elevated bilaterally. The edges of the nasoseptal perforation are carefully rimmed. An incision is then made in the anteroposterior direction at the attachment of the inferior turbinate to the lateral nasal sidewall (Figure 1). Using a Cottle elevator, the mucosa is elevated off the floor of the nose. Once the entire flap is elevated, it is rotated and advanced into position to cover the nasoseptal perforation on the left (Figure 2). Attention is then turned to the right side, and an incision is made at the junction of the upper lateral cartilage and the septum or from the medial surface of the upper lateral cartilage (Figure 3), depending on how much mucosa is needed. A Cottle elevator is used to elevate the mucosal flap from the lateral nasal sidewall. This flap is rotated and advanced into position to cover the nasoseptal perforation on the right side (Figure 4). Septal or auricular cartilage is placed between the flaps. The left-sided flap is sutured to the superior edge of the perforation, and the right-sided flap is sutured to the inferior edge of the perforation using 5-0 chromic gut suture. The septum is then closed using 4-0 plain gut suture on a Keith needle.

**RESULTS**

Seven patients were identified with nasoseptal perforations that had been closed using bilateral mucosal advancement flaps (one inferiorly based flap advanced from the floor of the nose and another superiorly based flap advanced from the lateral nasal wall) between January 1, 2008, and January 1, 2011. Follow-up periods ranged from 6 months to 2 years. All 7 patients had intact closure of their nasoseptal perforation at the last follow-up visit. The anteroposterior lengths of the nasoseptal perforations ranged from 0.6 to 1.6 cm. Causes of nasoseptal perforations included trauma, cocaine use, systemic lupus erythematosus, recurrent cautery, and prolonged nasogastric tube placement. No complications were encountered during or after the surgical procedures.
Numerous techniques have been described for the repair of nasoseptal perforations. For small perforations less than 5.0 mm, direct closure can be considered so long as excessive tension is not created on the closure. Rotational flaps are most effective for anterior perforations up to 2.0 cm in height. Advancement flaps are useful for perforations up to 2.5 cm. In contrast, large subtotal perforations cannot be repaired with local tissues and may require regional flaps or interposition grafts.

Kridel et al2 popularized an external rhinoplasty approach for closure of larger nasoseptal perforations up to 4.0 cm using mucoperichondrial advancement flaps and interposition grafts, with a 77% success rate. Fairbanks3 used bipedicled mucosal advancement flaps for closure of nasoseptal perforations with an underlying fascial or pericranial autograft, describing a 95% closure rate. Friedman et al4 reported on the use of an inferior turbinate pedicled flap with division of the flap 3 weeks after surgery for nasoseptal perforations up to 2.0 cm in height, noting a 70% closure rate. Teymoortash and Werner5 described the use of a unilateral inferomeatal mucosal advancement flap, with a 100% success rate in the repair of nasoseptal perforations.

We use bilateral mucosal advancement flaps with cartilage positioned between the flaps to provide structural integrity to the septum. An advantage of this technique is that the natural respiratory mucosa is not disrupted. In addition, it can be combined with other procedures that may be needed for the relief of nasal obstruction, including septoplasty, nasal valve repair, and osteotomies, and can be performed via an endonasal or endoscopic approach or by open surgery. The single-stage nature of the procedure is advantageous. Well-vascularized flaps make this a hardy flap, with minimal possibility for flap failure due to necrosis. Finally, the main advantage of this technique is the bilateral closure with nonopposing suture lines, decreasing the risk for failure of the repair with recurrence of the nasoseptal perforation.

The main drawback to the technique is the size of nasoseptal perforations that can be closed because it has been used only in perforations up to 1.6 cm. Our study sample was small, and further use of this technique in more patients and in those with larger nasoseptal perforations will clarify the upper limit in perforation size. However, our procedure shows excellent promise as a novel technique for closure of small- to moderate-sized nasoseptal perforations.

Submitted for Publication: March 13, 2012; accepted May 14, 2012.

Published Online: July 16, 2012. doi:10.1001/archoto.2012.1204

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Author Contributions: Dr Olson had full access to all data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Raol and Olson. Acquisition of data: Raol and Olson. Analysis and interpretation of data: Raol and Olson. Drafting of the manuscript: Raol and Olson. Critical revision of the manuscript for important intellectual content: Raol and Olson. Statistical analysis: Raol. Administrative, technical, and material support: Olson. Study supervision: Olson.

Financial Disclosure: None reported.