

Repair of Nasal Septal Perforation Utilizing the Midface Degloving Technique

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A technique utilizing the midfacial degloving approach in the repair of nasal septal perforations in 24 patients is reported. The midface degloving approach was limited to patients with septal perforations greater than 3 cm and failed prior attempts at surgical closure. Bilateral posteriorly based unipedicled flaps were utilized in the septal closure. Complete closure was accomplished in 75% (18/24) of cases, with a follow-up of one to three years. Complications included reoperation in 25% (6/24) of cases and partial vestibular stenosis in 20% (5/24) of cases. A modification of our technique, relining the nasal floor with postauricular full-thickness skin grafts, has alleviated vestibular stenosis. (Arch Otolaryngol Head Neck Surg 1988;114:739-742)

Patients seek medical attention for perforations of the septum when symptoms arise. These symptoms include the following: crusting with obstruction and malodorous discharge, epistaxis, and whistling.

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Whistling is associated with small perforations and arises from disruption in laminar airflow. Most symptomatic perforations are large and involve the anterior cartilaginous portion of the septum. More posterior perforations tend to be less symptomatic due to the rapid

humidification of inspired air by the nasal lining and turbinates. Large perforations, 3 cm or greater, present significant surgical challenges that in the past have been treated primarily by nonoperative management, eg, local hygiene or silicone button obturation. This report presents our surgical experience with large, greater than 3 cm, septal perforations. We recommend a sublabbial midfacial degloving approach combined with bilateral posteriorly based unipedicle flaps for closure of these large perforations.

Materials And Methods Origins

Perforations of the septum are a well recognized complication of septal surgery. Most postsurgical perforations follow the classic Killian submucous resection with a swivel knife. Other iatrogenic causes of perforation include cryosurgery, cautery for epistaxis, or nasotracheal intubation. Unrecognized or untreated septal hematoma may progress to abscess formation and perforation.

In recent years, increased substance abuse with drugs, such as cocaine or methamphetamine, accounts for an ever increasing number of septal perforations. These perforations are usually large and progressive. They represent even more difficult surgical and medical challenges. The treating physicians must aggressively treat both the nose and the patients' chemical addiction to ensure successful results.

Preoperative Preparation

Preoperative evaluation and preparation is very important in the management of large septal perforations. Few patients present with clean, stable perforations. More frequently, there is a significant crusting with malodorous discharge and

low-grade infection. The mucosa is friable, bleeds easily, and is chronically inflamed. Sinusitis from chronic rhinitis and obstruction may be associated. If cocaine abuse is ongoing, surgery is absolutely contraindicated.

We start our patients on a regimen of intensive nasal care and hygiene. The patient is instructed to irrigate his nose two or three times a day with a Grossan nasal irrigating tip and a Water Pik. Use of emollients such as petroleum jelly or bacitracin ointment may assist in lubricating the nose and lessening crusting. At times, a course of antibiotic therapy is prescribed in conjunction with the irrigations. The patient is seen weekly, if possible, for suctioning and cleansing of his nose and the perforation. Once infection is eradicated, and good hygiene established with control of crusting, a course of intranasally administered topical steroid spray will decrease inflammation and assist in stabilizing the mucosa.

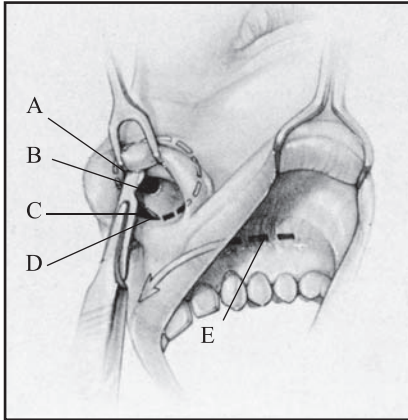


Fig 1. - Incisions used for midfacial degloving. **A** indicates intercartilaginous incision; **B**, perforation; **C**, complete transfixion incision; **D**, nasal floor and sill incision; and **E**, buccal vestibule incision.

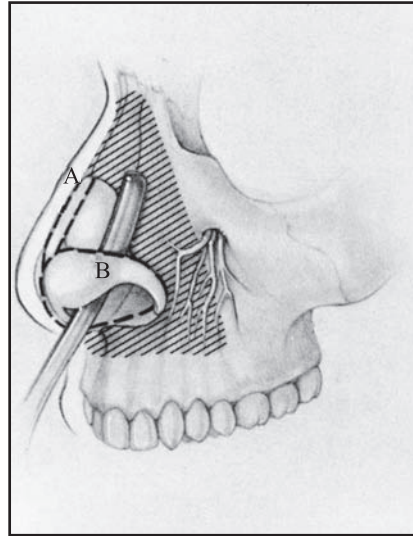


Fig 2. - Area of dissection for midfacial degloving. **A** indicates nasal dorsum and upper lateral cartilages; and **B**, lower lateral cartilages with elevator through intercartilaginous incision.

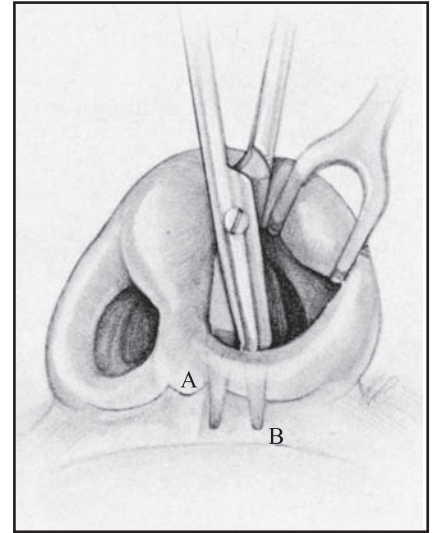


Fig 3. - Connecting of nasal and oral incisions. **A** indicates anterior nasal spine; and **B**, buccal vestibular incision.

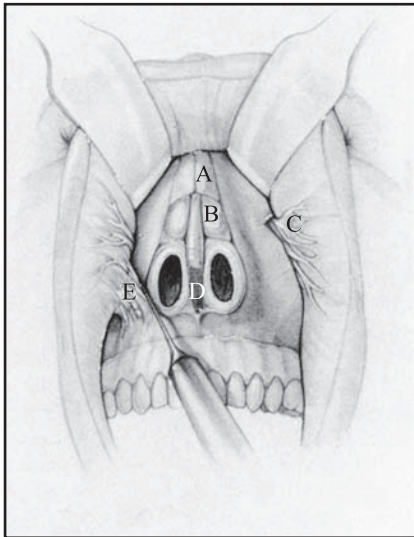


Fig 4. - Completing midfacial degloving. **A** indicates nasal bone; **B** upper cartilages; **C**, infraorbital nerve; **D**, septal angle; and **E**, soft tissue lateral to pyriform aperture being divided by electrocautery.

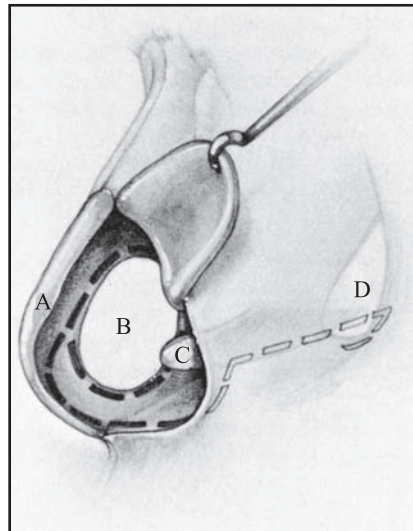


Fig 5. - Intranasal incisions for flap elevation; upper lateral cartilages retracted for exposure. **A** indicates septal angle; **B**, perforation; **C**, inferior turbinate infracted; and **D**, posterior nare.

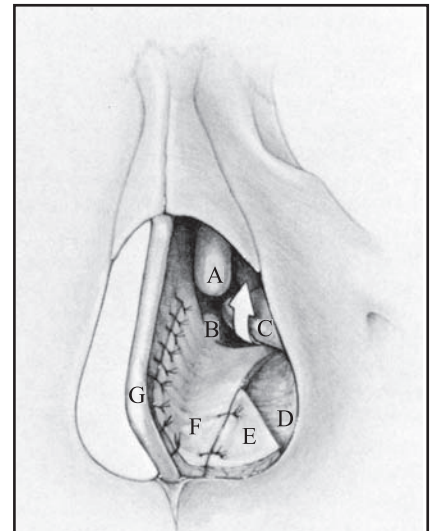


Fig 6. - Completion of flap elevation, rotation, and repair of perforation. **A** indicates middle turbinate; **B**, posterior nare; **C**, inferior turbinate infracted; **D**, raw surface area left by flap rotation; **E**, full-thickness skin graft on floor of nose; **F**, rotated flap; and **G**, septal angle.

and assist in stabilizing the mucosa. Surgery is undertaken only when the mucosa has stabilized, and inflammation and crusting are under control

Surgical Technique

The surgical technique proposed for closure of large septal perforations has the following three elements: (1) sublabbial, midfacial degloving approach for unparalleled exposure of the nasal fossae and perforation; (2) elevation, rotation, and meticulous suture closure of the

perforation with bilateral, posteriorly based unipedicled intranasal mucosal flaps, often in conjunction with septoplasty on the remaining septum; and (3) relining of the anterior nasal floor and sill region with postauricular full-thickness skin grafts to prevent anterior vestibular stenosis.

All these procedures are performed under general orotracheal anesthesia. The nasopharynx are packed with moist 2-in gauze. The intranasal mucosa is topically treated

with cocaine hydrochloride by using Mero-cel sponges impregnated with 3 to 5 mL of 4% cocaine hydrochloride solution. The soft tissues overlying the face of the maxilla, the gingivobuccal sulcus, nasal dorsum, intercartilaginous area, membranous septum, and

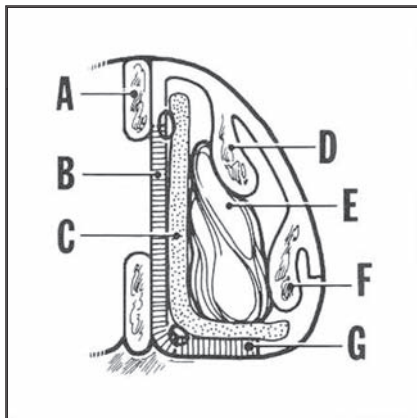


Fig 7. - Cross - section of intranasal dressing. **A** indicates dorsal septal strut; **B**, rotated septal flap; **C**, Tefla pad; **D**, middle turbinate; **E**, Merocel sponge; **F** inferior turbinate; and **G**, full-thickness skin graft.

sill are injected with 0.5% lidocaine hydrochloride with 1:200000 epinephrine bitartrate. Intranasal incisions are performed first (Fig 1). Bilateral intercartilaginous incisions are connected across the septal angle to a complete transfixion incision. The intercartilaginous incisions are carried laterally and inferiorly into the nasal floor and sill region, where they are connected to the complete transfixion incision.

Next, using cutting cautery, a complete gingivobuccal sulcus incision is performed from the region of one first molar across the midline to the other first molar (Fig 1).

The osseocartilaginous nose is then degloved over the upper lateral cartilages and nasal bones. The dissection is carried posteriorly and laterally over the nasal bones down onto the maxilla (Fig 2). The intranasal incisions are then connected to the gingivobuccal incision from pyriform apertures across the anterior nasal spine with a Stevens scissors (Fig 3).

The face of the maxilla is then stripped with a periosteal elevator identifying the edges of the pyriform apertures and the infraorbital nerves. This dissection is connected with the nasal degloving dissection. The tip structures and upper lip are retracted superiorly. The last remaining bridge of tissue lateral to the pyriform aperture and upper lateral cartilages is carefully divided with the cutting cautery (Fig 4). The midfacial degloving is now complete, isolating the nasal fossae at the level of the pyriform apertures, nasal valve, and septal angle. The tissues of the nasal tip, upper lip, and midface are retracted superiorly and

Table 1. - Results		
No. (%) (N=24)		
Closure	Relief of Symptoms	Reperforation
18 (75)	24 (100)	6 (25)

Table 2. - Complications	
No. (%) (N=24)	
Reperforation	Vestibular Stenosis
6 (25)	5 (20)

secured with 0.5 in Penrose drains.

To begin the second stage, the cocaine soaked Merocel sponges are removed from the nasal cavities. Local anesthetic solution is now injected subperichondrially and subperiosteally in the nasal septum, floor, and lateral wall of the nose. This hydrodissection assists in elevation of the flaps and provides additional hematostasis.

The septal perforation is incised along its circumference with a No. 15 blade and a Rosen oval ear knife. Bilateral posterior tunnels over the remaining septum are carefully developed. Any deviated bone or septal cartilage present is removed. This dissection is carried inferiorly to the maxillary crest.

Next, a horizontal incision through the septal mucosa from the anterior superior portion of the perforation to the caudal septum is performed (Fig 5). The anterior nasal mucosa is elevated off the caudal nasal septal strut back into the perforation and down to the region of the maxillary crest and nasal spine. In this region, the mucosa is closely adherent to the crest and spine, and there is a significant risk of tearing the flap. This portion of the dissection is left until last.

Next, the inferior turbinate is extended toward the median with a long nasal speculum exposing the lateral wall of the nose. A horizontal incision at the attachment of the inferior turbinate is made from the posterior nare to the pyriform aperture (Fig 5). Utilizing curved and straight Cottle elevators, the entire floor and lateral wall of the nose is degloved in the subperiosteal plane, posteriorly to the soft palate. This dissection is connected posteriorly to the posterior septal tunnel.

The mucosa is then carefully dissected off the anterior maxillary crest and nasal spine region, completing the intranasal degloving and elevation of the flaps. The

posteriorly based unipedicled flaps should now easily and with minimal tension rotate into position, obliterating the septal perforation. If the flaps do not easily rotate, the most likely cause is failure to complete the horizontal incision under the attachment of the inferior turbinate. Careful inspection of the posterior lateral nasal wall will usually reveal this, and the incision is completed. A releasing back cut can be made to ensure tension-free rotation of the flaps (Fig 5).

The flaps are secured, closing the perforation from posterior to anterior, with interrupted sutures of 6-0 or 7-0 silk. Occasionally with high-posterior perforations, the upper lateral cartilage may be separated from the septum to assist with exposure and access to the perforation. The flaps are rotated into position such that the floor mucosa covers the remaining anterior septal strut (Fig 6).

The last stage of the operation is harvesting a postauricular full-thickness skin graft. This graft is inset in the anterior nasal sill and floor region to resurface the open area created by flap rotation (Fig 6). It is useful to prevent partial stenosis of the anterior nare, sometimes seen as a sequelae of this procedure. An elliptic full-thickness skin graft is harvested and divided in half, producing two triangular shaped grafts. The base of the triangle is sutured to the nasal sill region with interrupted 5-0 chromic sutures. If possible, one side of the triangle is sutured to the lateral edges of the rotated mucosal flap now lying in the region of the maxillary crest and anterior nasal spine. The apex of the triangle is then laid onto the floor of the nasal cavity. This portion is stabilized in position by the nasal packing.

The last step is the intranasal dressing and suturing of the degloved midfacial and nasal tissues. The intranasal dressing is applied after repositioning the nasal and lip tissues. A Telfa pad is lubricated with bacitracin and folded around a Merocel sponge. This dressing is inserted carefully, sliding it into the nasal cavity. The Telfa pad should cover the septum and floor of the nose and be positioned inside the pyriform aperture (Fig 7). The full-thickness skin grafts should be reexamined to ensure their proper positioning. The intranasal incisions are closed with multiple 5-0 chromic sutures, and the gingivobuccal sulcus incision is closed with a running 3-0 chromic suture. An external tape and stent rhinoplasty dressing is applied to the nose. The nasal packing and stent dressing are removed five to seven days postoperatively.

RESULTS

The midfacial degloving approach in conjunction with bilateral posteriorly based nasal mucosa flaps, was utilized in the closure of septal perforations in 24 patients. Fourteen patients had previously undergone nasal septal surgery, and these perforations were probably iatrogenic in nature. Cocaine abuse was the causative agent for perforation in eight patients. Two patients gave no known reasons for their perforations. Nineteen patients had septal perforations equal to or greater than 3 cm, with the largest measuring 5 cm. Five patients had recurrent perforations, 3 cm or larger, following attempted transnasal surgical closure.

In our series, complete closure of perforation was achieved in 75% (18/24) of patients, and all patients' symptoms were improved. Partial re-perforation of the septum occurred in 25% (6/24) of cases (Table 1). All re-perforations were located on the posterior superior aspect of the original perforation site. In this region, if the flap is not adequately freed from the posterior lateral nasal floor, the vector of scar contracture can pull the flap inferiorly, partially reopening the closed perforation. Due to the posterior superior location of these recurrent perforations, the patient's preoperative symptoms were relieved. No further surgical therapy has been undertaken in these patients.

Partial stenosis of the nasal vestibule in the vicinity of the nasal sill was noted in 20% (5/24) of cases (Table 2). Patient complaints have ranged from nasal airway obstruction to aesthetic asymmetry in the nasal sill. Bilateral full-thickness skin grafts have been placed onto the anterior nasal floor to prevent this scar contracture. These grafts are harvested from the postauricular region and sutured to the nasal sill and medial portion of the rotated flap. No cases of vestibular stenosis have been noted since incorporating this technique.

COMMENT

Portmann and Retrovey¹ described a combined sublabial transoral approach for maxillectomy in 1927. Casson et al,² in 1974, reported the midfacial degloving approach, essentially as described here.³ Allen and Siegel³ in 1981, and Conley and Price⁴ in 1979, utilized the midfacial degloving approach for benign lesions and lowgrade malignancies of the midface and nasal cavities. Sachs et al⁵ reported 46 cases of inverting papilloma treated with the midfacial degloving procedure. Maniglia,⁶ in 1986, reported his experience with the midfacial degloving operation in 30 patients for various indications, including repair of a

large septal perforation.

Most reports of septal perforation repair advocate a transnasal approach to the perforation.⁷⁻⁹ Karlan et al¹⁰ described sublabial access for development of intranasal flaps but not complete degloving of the nose. Belmont¹¹ advocated alarotomy to increase exposure, if necessary, with a transnasal approach. Kridel et al⁵ advocated the external rhinoplasty approach.

We are proposing the midfacial degloving approach for repair of most septal perforations, but particularly for large perforations (>3 cm) or re-perforation after an unsuccessful repair. This approach affords unparalleled exposure to the nasal cavities and the perforation. Exposure is facilitated to the posterosuperior portion of the perforation where suture repair is technically most difficult and failure most likely to occur. Intranasal flap development is promoted and, subsequently, one is less likely to tear or damage the flaps during elevation. Adequate elevation of the flaps ensures tension free rotation and securing of the flaps, lessening the likelihood of failure and re-perforation.

Use of posteriorly based, unipedicled, mucoperiosteal flaps has been described in the past. These flaps, based on the sphenopalatine artery, provide ample length, width, and thickness to repair these large perforations.

No reinforcement grafts of fascia, periosteum, or cartilage were used in our series. Even without such grafts, results comparable with those by alternative methods for these challenging cases were achieved.

Results reported in multiple series for perforations smaller than 3 cm utilizing the transnasal approach ranged from 94% to 100%.⁸⁻¹⁰ Kridel et al,¹² utilizing the external rhinoplasty approach, achieved closure in 77% (17/22) of perforations as large as 4 cm.¹² In this series, all perforations were larger than 3 cm, including several failures of previous repair attempts. Complete closure was obtained in 75% (18/24) of our cases.

In conclusion, the combination of sublabial midfacial degloving approach for exposure and bilateral posteriorly based mucoperiosteal nasal flaps for closure is advocated in treating large, difficult septal perforations. In this series, a 75% (18/24) rate of complete closure was accomplished utilizing this approach. No periosteal or facial interposition grafts were used.

Complications have been limited to small posterior septal re-perforations in 25% (6/24) of cases, which have been asymptomatic. Partial anterior vestibular stenoses were seen in 20% (5/4) of our cases. This complication has been obviated by relining the vestibule

with full-thickness skin grafts.

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