

Middle turbinate medialization for improved access during endoscopic sinus surgery

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Introduction: Proper management of the middle turbinate in endoscopic sinus surgery is often a topic of debate. Most authors, however, agree in the need to prevent lateralization. We describe our preferred technique and stress the timing of the medialization procedure.

Methods: The middle turbinates are sutured to the nasal septum at the beginning of the operation. This allows optimal access to the nasal cavity and paranasal sinuses during the entirety of the operation.

Discussion: Multiple techniques have been described to prevent lateralization of the middle turbinate. It is our opinion that implementing the proposed technique at the start

of the surgery allows for optimal exposure during the operation. © 2011 ARS-AAOA, LLC.

Key Words:

endoscopic sinus surgery; middle turbinate; middle turbinate medialization; lateralization; surgical exposure; nasal septum; conchopexy; synechia; ostiomeatal complex

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The role of the middle turbinate as a vital landmark during endoscopic sinus surgery has been well established. Proper management of this important structure, however, remains somewhat controversial.^{1,2} Some authors have suggested either partial or complete resection both to accommodate postoperative care and more importantly to prevent scar formation and lateralization of the turbinate to the lateral nasal wall. Lateralization of the middle turbinate is a concern, considering the potential for obstruction of the ostiomeatal complex.^{3,4} In order to preserve the middle turbinate and prevent lateralization, several techniques have been previously described.⁴⁻⁶ We discuss middle turbinate medialization, with emphasis on timing of this technique at the initiation of surgery to allow optimal access to the uncinate process, infundibulum, and other important structures during endoscopic sinus surgery.

Surgical method

Following administration of general anesthesia, the patient's nose is decongested with oxymetazoline-treated pledgets. Local anesthetic is then introduced into the nasal

mucosa of the septum, middle turbinate, and uncinate process. The pterygopalatine fossa is also injected. The nasal pledgets are now reintroduced and the patient is prepped and draped. Endoscopic septoplasty is performed when necessary. At this time the pledgets are removed and with the assistance of the 0-degree endoscope we perform middle turbinate medialization. A 4-0 vicryl suture on a P3 needle is obtained and the needle is partially straightened (Fig. 1). The needle retains some curvature but the slight straightening allows easy passage through the tissue. The needle is initially passed lateral to medial through the middle turbinate and then through the nasal septum (Fig. 2). The trajectory carries the needle through the contralateral middle turbinate. On occasion, the endoscope is used to secure the middle turbinate while the needle is being passed through. The needle is now retrieved and passed back through the septum anterior to the head of the middle turbinate (Figs. 3 and 4). Once the needle passes through the septum to the initial side the suture is tied with the use of a bayonet needle driver (Figs. 5 and 6). An assistant holds the endoscope so that the knot is tied under direct visualization. The suture is left in place throughout the operation and at the conclusion to prevent lateralization of the turbinate and adhesion formation.

Discussion

Lateralization of the middle turbinate is a common cause of recalcitrant sinusitis.^{2,3} Thornton⁴ discussed his experience in 31 patients undergoing endoscopic sinus surgery.

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FIGURE 1. The P3 needle is slightly straightened with the use of a hemostat to facilitate passage through middle turbinate and septum.

In all patients a turbinate transseptal suture was applied to medialize the middle turbinate. He reported a patent middle meatus in all but 1 patient in which the suture had parted. Thorton⁴ concluded that by applying the suture stabilization of the middle turbinate one could prevent scarring and obstruction of the middle meatus. Several other surgeons have reported using the suture stabilization or conchopexy technique.⁵⁻⁷ We suggest performing the medialization technique at the beginning of the operation to allow greater access to the nose and paranasal sinuses during surgery.

In a retrospective review of suture medialization, Hewitt and Orlandi⁶ reported the results regarding 85 patients treated with endoscopic sinus surgery. They sought to ascertain the incidence of postoperative middle turbinate adhesion to the lateral nasal wall. They found adhesions occurring in only 10% of patients and that only 4 of

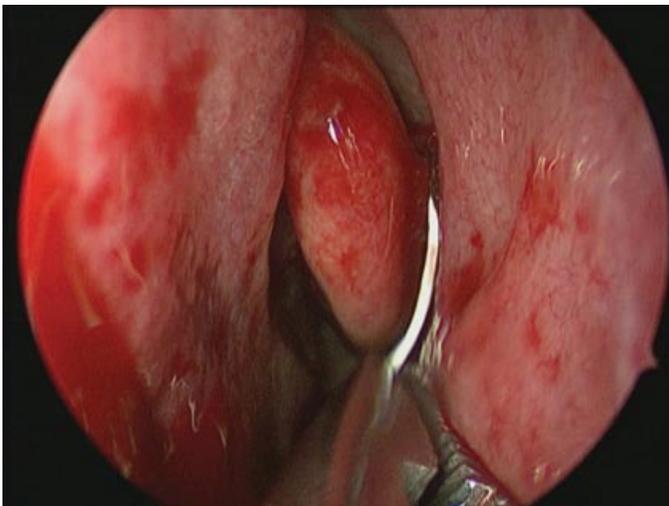


FIGURE 2. The suture is initially passed in a lateral to medial direction through the middle turbinate.

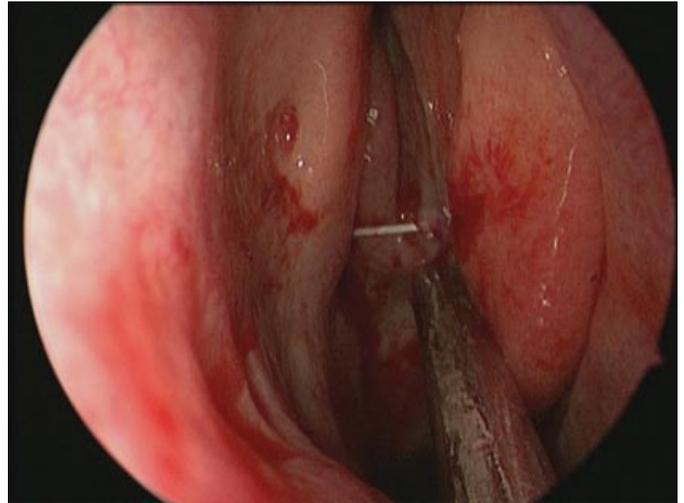


FIGURE 3. The needle is received after penetrating the septum and contralateral middle turbinate.

the 157 middle turbinates developed synechiae substantial enough to become clinically significant. They concluded that the development of clinically significant adhesions following medialization of the middle turbinate is uncommon and the technique should be considered as an alternative to packing or stenting of the nasal cavity.⁶ Jebeles and Hicks⁸ described a technique in which the middle turbinate was medialized with a Cottle elevator while a 1-cm × 1-cm Merocel sponge was placed into the middle meatus between the ethmoid bulla and the middle turbinate. Normal saline was then applied to the sponge, which when expanded allowed better visualization of the area. At the conclusion of the operation they removed the smaller packing and placed a much larger Merocel sponge to maintain a medialized middle turbinate.⁸ Others have suggested the idea of controlled therapeutic synechiae. Bolger et al.⁹ described their experience

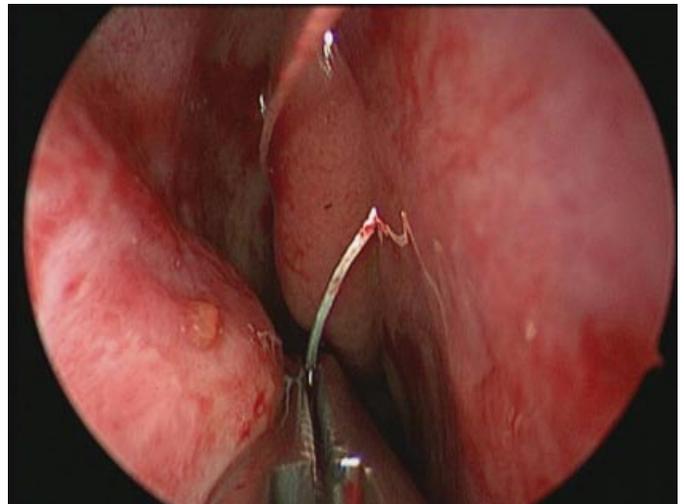


FIGURE 4. Following retrieval of the needle in the contralateral nasal cavity, the suture is brought anterior to the middle turbinate and passed back through the septum.

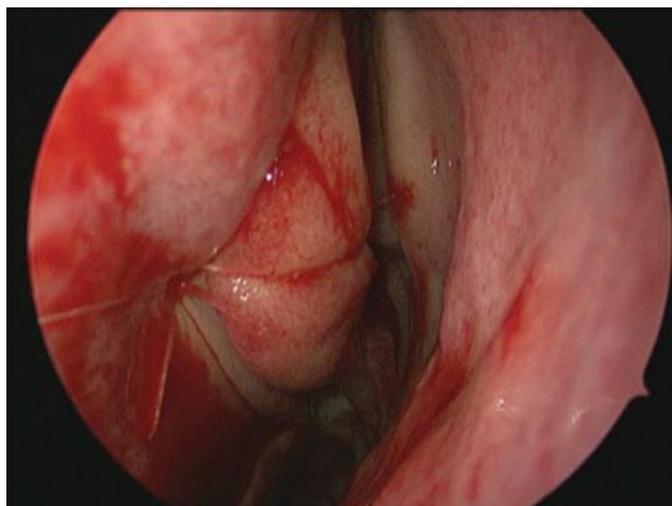


FIGURE 5. The needle is now identified in the initial nasal cavity and tied securely. With the middle turbinate medialized, the uncinus process is identifiable and more easily accessible during the surgery.

in patients following ethmoidectomy in which the middle turbinate lacked structural fortitude. In these patients, 4 shallow mucosal incisions were made on the medial aspect of the middle turbinate using a sickle knife. On the nasal septum, just opposite of the turbinate, additional incisions were made to violate the mucosa. Packing was then placed in the middle meatus, forcing the middle turbinate to abut the septum.⁹ These nasal packs were removed 24-48 hours later. The authors admit to variation in postoperative care and that occasionally Gelfilm would be placed after packing removal to further prevent scarring⁹; they cited technical difficulty and invariable results related to concerns with suture stabilization. Friedman and Schach¹ report a similar approach using the microdebrider to create the mucosal irritation on both the septum and turbinate. Following the denuding of the mucosa, bovine serum albumin tissue adhesive (BioGlue) was applied to the region using a tip extender attached to a dual-chambered syringe. The 2

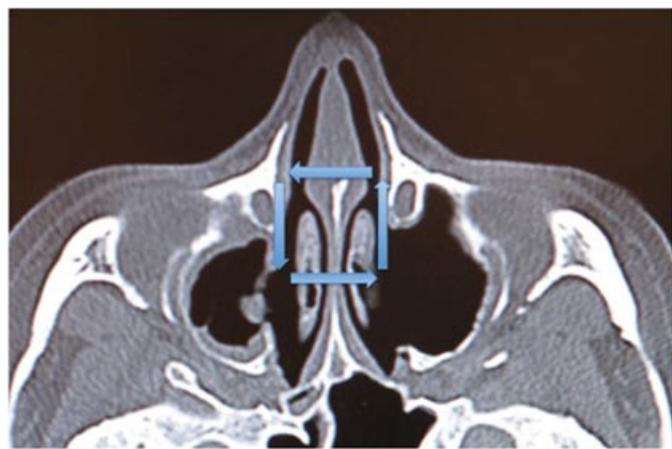


FIGURE 6. CT image demonstrating suture medialization. CT = computed tomography.

TABLE 1. Medialization techniques

Technique	Technical difficulty	Intraoperative access	Nasal packing	Planned synechiae
Marple	Moderate	High	None	None
Thorton	Moderate	Low	None	None
Jebeles	Low	Moderate	Present	None
Bolger	Low	Low	Present	Present
Friedman	Moderate	Low	None	Present
Kuppersmith	Moderate	Low	Present	None

surfaces were then pressed together with temporary nasal packing for 3 minutes. This allowed the adhesive to fully polymerize and avoided the use of postoperative nasal packing.¹ Kuppersmith and Atkins¹⁰ recently described the use of a bioresorbable implant (L-lactide-co-glycolide) used to medialize the middle turbinate in sinus surgery. The implant is placed between the septum and middle turbinate either during surgery to optimize access or at the conclusion of the surgery to prevent lateralization and synechiae formation. The implant possesses a medial barb that is implanted into the septum and 3 lateral barbs on the opposite side that fasten to the middle turbinate. The implant, if left following surgery, is removed 2 weeks later.¹⁰ In a recent review by Weitzel and Wormald¹¹ regarding nasal packing, they concluded that for the purpose of preventing adhesions, resorbable packs offered no benefit over either nonresorbable or no packing. They also recommend suturing the septum to the middle turbinate if it is unstable at the conclusion of surgery and suggest that this technique may reduce adhesion formation.¹¹ Though most literature published on the medialization of the middle turbinate focuses on preventing lateral adhesions, these techniques can seemingly benefit the surgeon during the operation in addition to the postoperative period. Success in endoscopic surgery of the sinuses relies strongly upon visualization of key anatomic structures. With application of the aforementioned technique the surgeon allows for maximal exposure to these areas and improved manipulation with the endoscope and instrumentation. By allowing unabated access to the sinuses the surgeon maximizes visualization and avoids inadvertent damage to the surrounding mucosal surfaces.

Though many authors have described techniques in which medialization of the middle turbinate was the objective, we describe somewhat modified suture stabilization with emphasis placed on the timing of the suture (Table 1). In addition, our technique allows the avoidance of postoperative nasal packing, which can incite pain, rhinorrhea, nasal obstruction, and bleeding.¹² It is important to note that a learning curve does exist in developing the surgical skills necessary to place the medialization suture. However, it has been our experience that these skills are easily achievable and ultimately result in a more timely operation. 📌

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