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# Turbinoplasty for concha bullosa: A non-synechiae-forming alternative to middle turbinectomy*

Gady Har-El, David H. Slavit

Department of Otolaryngology, State University of New York, Health Science Center at Brooklyn, New York, USA

SUMMARY

*A large pneumatized middle turbinate (concha bullosa) may require surgical reduction. Partial middle turbinectomy, especially when done simultaneously with uncinectomy and ethmoidectomy, results in an increased risk for adhesion formation in the middle meatus. Turbinoplasty is a procedure that results in a significant reduction of the width of the middle turbinate without injuring its mucosal surfaces. A 4-year experience with this procedure showed almost complete elimination of the synechiae problem.*

*Key words: middle turbinate, concha bullosa, turbinectomy, synechiae*

## INTRODUCTION

There are four main indications for the surgical treatment of the large pneumatized middle turbinate (concha bullosa). First, to remove the concha's contents in case of infection, air-fluid level, or thickened or polypoid mucosa. Second, to relieve airway obstruction, especially in cases of extremely large turbinates. Third, to provide an easy access to the ostiomeatal complex (Schaefer et al., 1989; Wigand, 1990; May et al., 1993; Rice and Schaefer, 1993). Fourth, to treat "Middle Meatus Obstructive Syndrome" as described by Huizing (1988). He claimed that there should be no contact between the middle turbinate and the septum, or the middle turbinate and the lateral nasal wall. Such contact enhances infection and may result in neuralgic pain or pressure sensation (Huizing, 1988).

The two most common procedures that have been used are total or subtotal middle turbinectomy, and partial lateral middle turbinectomy. Total or subtotal middle turbinectomy is indicated when there is significant disease covering the entire turbinate.

Many surgeons have objected to total turbinectomy because of the possible risk of olfactory disfunction (Wigand, 1990). However, it seems that in some cases this procedure is unavoidable (Kennedy and Zinreich, 1988; May et al., 1993). Partial lateral turbinectomy is performed by incising the anterior surface of the turbinate in a vertical direction, entering the cell, and removing the lateral lamella (Messerklinger, 1978; Kennedy and Zinreich, 1988; Schaefer et al., 1989; May et al., 1993; Rice and Schaefer, 1993). It has been repeatedly stated, however, that the creation of a raw surface facing the ostiomeatal complex may result in adhesion formation (Wigand, 1990; Lazar et al., 1993; Rice and Schaefer, 1993). It is the authors' experience that in cases of lateral middle turbinectomy performed simultaneously with uncinectomy and ethmoidectomy, synechiae may form in up to 15% of the patients. Although not all synechiae are clinically significant, their management is time-consuming and some of them are the main causes of failure and recurrent sinus diseases.

The use of "spacers" has certainly decreased the incidence of middle meatal adhesions (Lazar et al., 1993; May et al., 1993). Different combinations of ointments and creams with or without materials as gelfoam, gelfilm, silastic sheet, or Merocel sponges have been used. These are very helpful, and when combined with a meticulous post-operative care, it will reduce significantly the occurrence of post-operative adhesions.

Wigand (1993) has described a procedure that may help preventing adhesion formation. After performing partial turbinectomy by removal of the lateral lamella, the medial lamella is folded over and attached to the roof of the ethmoid with fibrin glue. This prevents the situation where the raw surface of the turbinate is facing the raw surface of the ethmoidectomy region, so synechiae are less likely to occur and, at the same time, the medial lamella of the turbinate is preserved thus preserving the olfactory function.

May et al. (1993) described partial middle turbinectomy where the anterior inferior third is removed, leaving both the anterior and the posterior attachments of the turbinate intact. This

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procedure, however, does not address the problem of a large concha bullosa containing infected and polypoid mucosa. After using all of these procedures, and although experiencing significant reduction in the incidence of synechiae, the authors have been searching for a procedure that will avoid the creation of raw surfaces on both sides of the middle meatus, and therefore avoid the risk of adhesion formation.

Pirsig (1972) and Huizing (1978, 1988) described "Middle Turbinate Reduction." The mucosa is incised anteriorly and inferiorly and the mucoperiosteum is elevated on both sides of the bony turbinate. The bony concha is then entered and the medial half is resected and removed with the entire inner mucosal lining. The turbinate is then compressed with forceps. The turbinate is also trimmed anteriorly and inferiorly. Our procedure follows, with a few modifications, this technique.

SURGICAL TECHNIQUE

The procedure may be done under local or general anaesthesia. It may be performed before or after septoplasty but always before ethmoidectomy and other middle meatal work. Neurosurgical cottonoids soaked with 5% cocaine solution are placed medial and lateral to the concha bullosa. After the cottonoids are removed, 1% lidocaine with epinephrine solution (1:100,000) is injected with an angled needle into the anterior face of the turbinate and along its inferior aspect. A sickle knife is used to make a vertical incision along the anterior face of the turbinate (Figure 1A). The cell within the turbinate is entered. Straight forceps are used to remove polyps and infected material from within the turbinate in cases where such disease is present (Figure 1B). This step is not required in cases of an enlarged concha bullosa without disease. A curette is then introduced

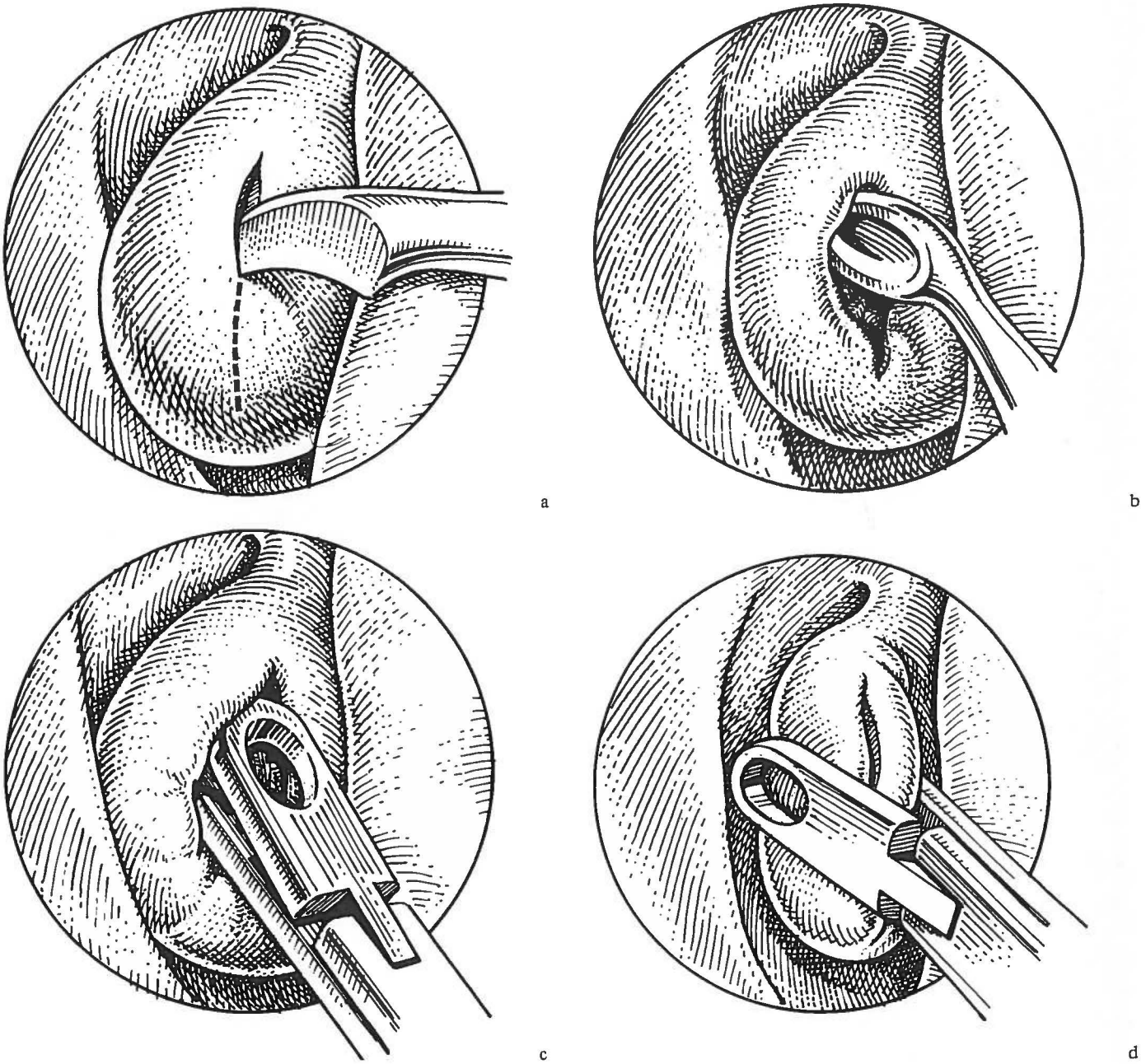


Figure 1A–D. Turbinoplasty (right middle turbinate). A: vertical incision; B: enlarging the opening and removing diseased mucosa; C: curettage; D: crushing the turbinate.

into the cell and the mucosa is curetted and removed (Figure 1C). It is important to try and remove all the mucosa from within the cell. Next, a large straight forceps or a large duckbill fragment forceps is introduced into the nose in a horizontal position. The turbinate is then crushed with the forceps starting at the superior attachment and is moving inferiorly and then posteriorly (Figure 1D). The entire height and at least two-thirds of the length of the turbinate are crushed. The surgeon may then procood with the middle meatal work. The purpose of curettage within the cell is: (a) to remove inflammatory mucosa and/or polyps from within the cell in cases where such disease is present; (b) to avoid the formation of inflammatory mucosa within the cell as a result of the crushing; and (c) to prevent the late formation of mucocele.

RESULTS

At the time of this writing (October 1994), 63 turbinoplasties have been performed. There were no complications related to the procedure itself and good exposure of the ostiomeatal complex with complete preservation of all mucosal surfaces of the turbinate were achieved in all cases (Figure 2). Forty-three cases have follow-up of 1-4 years. Of these patients, three had evidence of minimal middle meatal adhesions. None of them were clinically significant and no need for additional intervention was required. The need for post-operative middle meatal cleaning was significantly reduced when compared to patients who had simultaneous ethmoidectomy and partial lateral turbinectomy. The turbinate may become slightly oedematous during the first two weeks but then it will shrink again. Crushing the middle turbinate has been done by surgeons before, but there was always concern about late formation of mucoceles. We believe that the additional curettage within the concha bullosa prevents this rare complication. In fact, post-operative CT scan which was performed in three patients showed a completely collapsed turbinate with no air space.

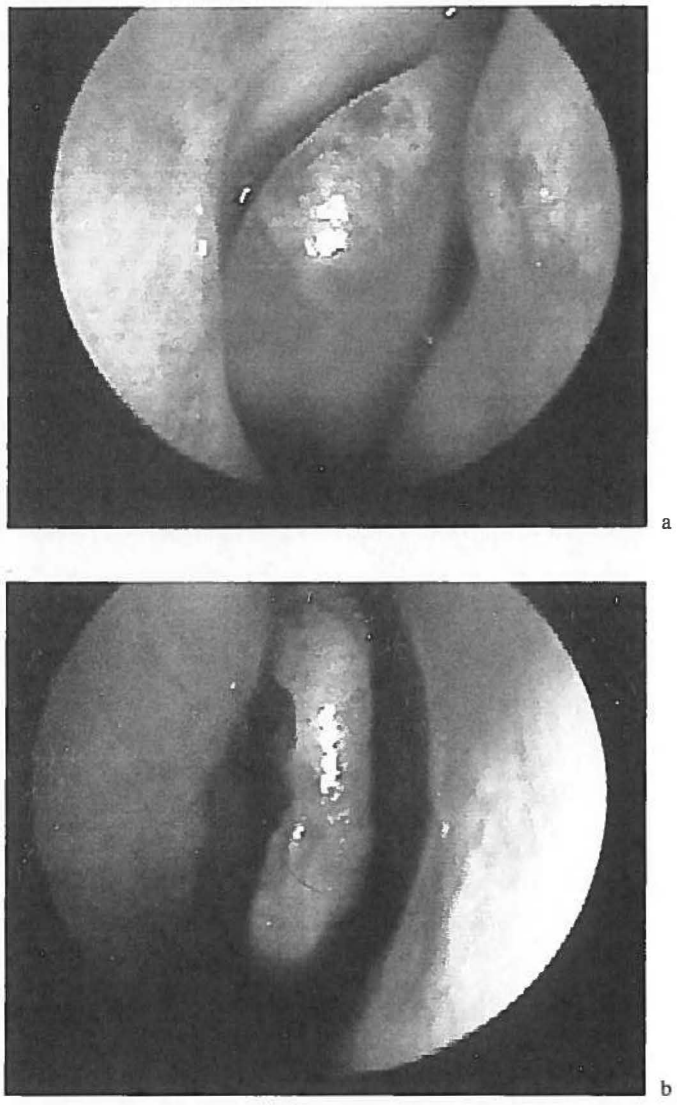


Figure 2. Before (A) and immediately after (B) right turbinoplasty.

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Gady Har-El, MD
Department of Otolaryngology
Long Island College Hospital
340 Henry Street
Brooklyn, NY 11201
U.S.A.