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Conchopexy suture to prevent middle turbinate lateralisation and septal haematoma after endoscopic sinus surgery*

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SUMMARY

Endoscopic ethmoidectomy is now one of the commonest surgical procedures performed by ear, nose and throat surgeons. Access to the ethmoid air cells is via the middle meatus following medialisation of the middle turbinate and uncinectomy. The most satisfactory post-operative results are achieved by maintaining patency of the middle meatus. This allows delivery of topical medication and sinus aeration. Spontaneous lateralisation of the middle turbinate during the healing period, with or without synechiae, can compromise the surgical benefit. This paper describes a conchopexy suture placed at completion of ethmoidectomy. A carefully placed yet simple suture technique will maintain a widely patent middle meatus during the phase of post-operative healing. A slight modification allows quilting of mucoperichondrial flaps after septal surgery.

Key words: turbinate, middle, endoscopic, surgery, suture

INTRODUCTION

Access to the ethmoid air cells is via the middle meatus, lateral to the head and body of the middle turbinate. Gentle medialisation of the middle turbinate, followed by uncinectomy, is usually all that is required to enhance access. During the course of endoscopic sinus surgery however, it is not unusual for the mucosal surface of the middle turbinate to become traumatised. This is despite the surgeon's best intentions. Furthermore, enthusiastic resection of the horizontal portion of the third lamella can lead to an unstable middle turbinate. In combination, these factors predispose the turbinate to lateralisation with or without synechiae formation. Should this happen, optimal surgical results are compromised.

Various techniques are described to prevent middle turbinate lateralisation after sinus surgery. These include prophylactic partial turbinate resection [1], "controlled" synechiae formation [2,3], and middle turbinate-septum clipping [4]. However, we do not advocate unnecessary resection or further trauma to an already fragile anatomic structure. Middle turbinate-septum suturing techniques have been evaluated and are of use [5,6]. Ours is a technique that is simple to implement and effective at preventing middle turbinate lateralisation. It has been independently developed and used successfully for the last 6 years.

SURGICAL TECHNIQUE

Step 1: After completion of ethmoidectomy and endoscopic septal surgery, we insert a temporary cotton wool pack into the middle meatus. This pack is the same as was used at the onset of surgery to obtain vasoconstriction and local anaesthesia. The pack is soaked with 5% Cocaine solution or where this is not available, Co-Phenylcaine (Lidocaine 5% and Phenylephrine 0.5%, Aurum Pharmaceuticals Ltd, Essex, UK). Pack insertion in the sinus cavity stents the middle turbinate against the septum medially.

Step 2: A caudal 3/0 Vicryl rapide suture (Ethicon) is placed from left to right through the septal cartilage, just above the maxillary crest, using a reverse-cutting needle. The needle is retrieved endoscopically in the right nostril.

Step 3: Under endoscopic control, a suture is placed from lateral to medial through the head of the right middle turbinate, through the bony septum and head of the left middle turbinate (Figures 1 and 2). The needle is retrieved in the left middle meatus.

Step 4: After retrieving the needle in the left middle meatus, the cartilaginous septum is traversed high / dorsally from left to right.

Step 5: A final pass is made posteriorly through the cartilaginous septum adjacent to the bony maxillary crest.

Step 6: A knot is tied in the floor of the left nostril anteriorly. This is a completed conchopexy-quilting suture (Figure 3). A characteristic 'parallel' arrangement of the suture is observed in the left nostril (Figure 4). A 'crossed' placement in the right nostril secures mucoperichondrial flaps following septal surgery (Figure 5).

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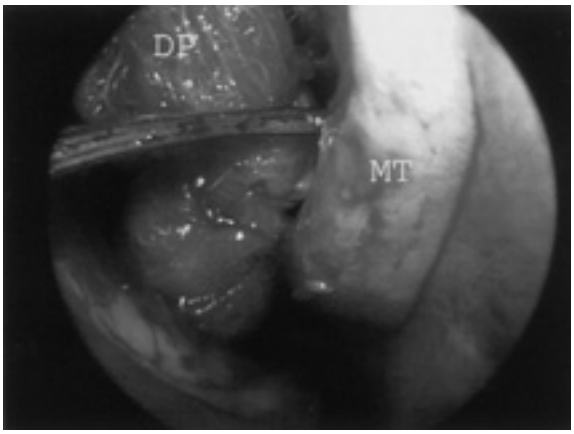

Figure 1. 'Dirty' cotton wool pack used to stabilise right middle turbinate. Suture needle is being passed through head of right middle turbinate.

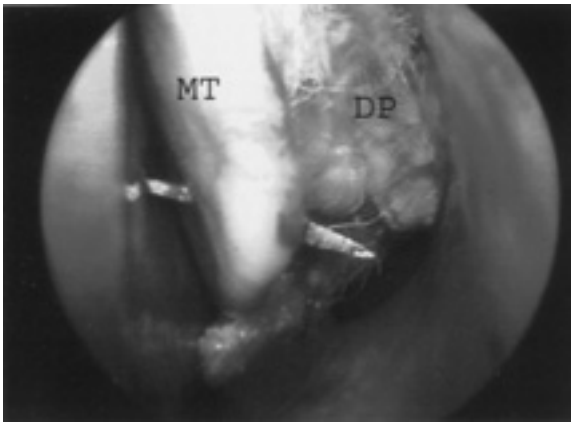

Figure 2. Needle accurately traverses head of left middle turbinate. Note that the left middle turbinate has also been stabilised with a 'dirty' pack. The needle is retrieved in the left middle meatus.

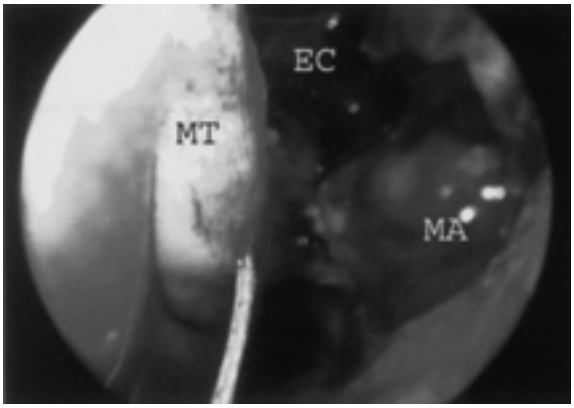

Figure 3. Completed conchopexy suture. Note the medialised middle turbinate and widely patent sinus complex.

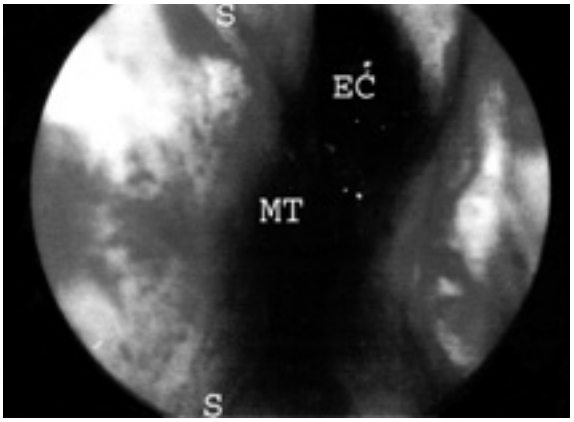

Figure 4. Characteristic 'parallel' suture in left nostril.

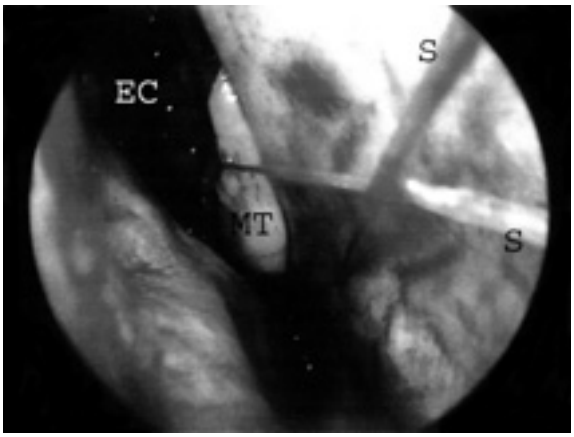

Figure 5. 'Crossed' suture placement in right nostril secures mucoperichondrial flaps elevated during endoscopic septal surgery.

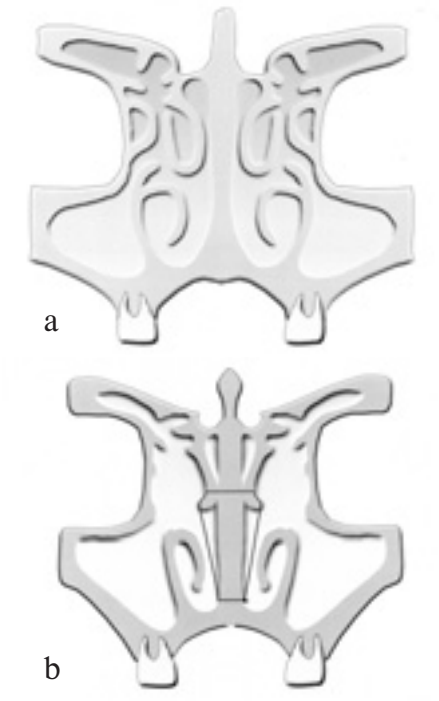

Figure 6. (a)Schematic representation of sinus complex prior to endoscopic sinus surgery. (b) Schematic representation of sinus complex after completion of endoscopic sinus surgery with a conchopexy suture in-situ to hold the middle turbinates in a medialised position.
MT = middle turbinate; DP = dirty (cotton wool – vasoconstrictor) pack; EC = ethmoid complex; MA = maxillary antrum; S = suture.

In the absence of endoscopic septal surgery Steps 1 to 3, with a knot tied anteriorly in the floor of the left nostril, allow successful medialisation of both middle turbinates. Figure 6a illustrates a schematic representation of the sinus complex prior to endoscopic uncinectomy, ethmoidectomy and middle meatal antrostomy. Figure 6b shows the sinus complex after completion of surgery with a conchopexy suture holding the middle turbinates in a medialised position against the nasal septum.

DISCUSSION

The technique described has provided us with a simple means of maintaining patency of the middle meatus after endoscopic sinus surgery. The senior author has routinely used this technique for the past 6 years with good results in over 300 patients per year. The rapid degradation of Vicryl rapide ensures that medialisation of the middle turbinates is only maintained during the phase of mucosal healing. Its subsequent weakening and detachment allows the turbinates to return to an anatomical position after mucosal healing. One would anticipate a risk of an adhesion between the middle turbinate and septum but this has not proven to be the case in our experience.

The primary role of endoscopic sinus surgery is to open the osteomeatal complex to enhance the ingress of medical therapy for rhinosinusitis. There is no evidence that medialising the middle turbinate has any effect on olfaction. A lateralised middle turbinate is far more likely to adhere to the lateral nasal wall. This occludes the osteomeatal complex, subsequently compromising the effects of the surgery.

We have found the cotton wool-vasoconstrictor ('dirty pack') concept extremely useful in our endoscopic sinus surgery. At the onset of surgery the pack enables preparation of mucosal surfaces, providing vasoconstriction and local anaesthesia. In addition to stabilising the middle turbinate against the septum during surgery, we have found the dirty pack secures haemostasis in the newly opened sinus complex. This affords a better view of the postoperative field.

Septal surgery during sinus surgery is usually performed endoscopically where an anterior septal deflection warrants correction. Access to the septal cartilage is almost invariably achieved via an incision in the right nostril. This is regardless of the direction of the septal deflection. Although an incision on the side of the septal concavity would appear logical (to avoid mucoperichondrial flap impingement on the endoscope during subsequent sinus surgery), we have not encountered any difficulties. The senior author invariably operates on the left side first. During the period of left sided ethmoidal surgery, surgical patties soaked with 1:1000 Epinephrine are placed in the right middle meatus and some over the area of mucoperichondrial flap elevation. Consequently, this area is very seldom swollen by the time surgery on the right side commences.

Many authors advocate quilting mucoperichondrial flaps in a random fashion after septal surgery. We feel this is prone to develop areas of ischaemia as the sutures may tightly cross each other in a very narrow area of septum. The standard conchopexy suture described provides a safe longitudinal suture that opposes the mucoperichondrial flaps against the septal cartilage. This has afforded a minimal risk of flap ischaemia. Consequently, both septal haematoma and septal perforation are extremely rare in our hands.

Contrary to previous work, the authors have not encountered any difficulty in traversing the bony perpendicular plate even without septal surgery having been performed. This is attributed to the reverse-cutting needle.

We would like to recommend the conchopexy suture as a means of stabilising the middle turbinate medially during mucosal healing after endoscopic sinus surgery. The suture is particularly appropriate in stabilising the medial lamina of a concha bullosa once the lateral lamina has been resected. Another application is after endoscopic pituitary surgery. The conchopexy suture stabilises the middle turbinate medially after it has been significantly lateralised during the pituitary approach work. The conchopexy suture avoids further unnecessary trauma to the middle turbinate mucosa, is simple to implement and reduces the risk of turbinate lateralisation and synechiae formation.

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