Occurrence of Middle Turbinate Lateralization after Axillary Flap Approach to the Frontal Recess

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Abstract

Background: The Axillary Flap Approach (AFA) to the frontal recess improves visualization and clearance and decreases the use of angled endoscopes. However, some argue that it destabilizes the Middle Turbinate (MT) and increases risk of Middle Turbinate Lateralization (MTL).

Objective: To establish rate of middle turbinate lateralization after axillary flap approach.

Patients and Methods: This retrospective study was conducted on 30 patients underwent axillary flap approach to the frontal recess. Post-operative follow-up nasal endoscopy was done after 6 months. Presence of MTL and ability to evaluate the frontal recess were recorded. Cases were excluded if the MT was absent.

Results: A total of 30 patients (54 operated sides) were included in the study. Overall rate of MTL was 13% (7 sides of total 54 sides) and adhesions in the frontal recess was 5.6% (3 sides of total 54 sides).

Conclusion: The axillary flap approach yielded a 13% MTL in this study. This rate appears consistent with reports in the literature that did not use the axillary flap.

Key Words: Middle turbinate lateralization – Endoscopic sinus surgery – Frontal recess – Axillary flap approach – Middle turbinate.

Introduction

In endoscopic sinus surgery, management of the frontal sinus remains challenging for many surgeons due to the complex and variable anatomy. The Axillary Flap Approach (AFA) was developed to improve access, visualization, and clearance of the frontal recess. Advantages of this technique are that the majority of the surgery is performed with 0-degree and 30-degree endoscopes, rather than a 70-degree endoscope and the mucosal axillary flap covers exposed bone of the Middle Turbinate (MT), thereby decreasing contracture and scarring at the frontal recess [1].

Despite improved access at the time of surgery, one theoretical concern about the AFA is destabilization of the MT with resulting lateralization (MTL). MTL is one of the most common complications of Endoscopic Sinus Surgery (ESS), with incidence in the literature reported as high as 43% [2] and, therefore, various techniques have been described in the literature in an attempt to decrease lateralization. MTL potentially decreases drainage of frontal, anterior ethmoid, and maxillary sinuses in addition to compromising the ability to debride the sinonasal cavity, irrigate, and administer topical medications. The MTL was defined as any portion of the body or head of the middle turbinate contacting the lateral nasal wall [3].

The goals of this study were to determine the incidence of MTL after an axillary flap is performed.

Patients and Methods

This is a retrospective study that was conducted on 30 patients underwent axillary flap approach to the frontal recess due to frontal sinus disease including chronic rhinosinusitis, nasal polyps and allergic fungal sinusitis, who presented to the Otorhinolaryngology Outpatient Clinic, Kasr Al-Ainy Hospital, Faculty of Medicine, Cairo University between November 2014 and February 2016. Fourteen patients were males and sixteen patients were females, with male to female ratio was 1:1.14. The age of patients ranged between 15-48 years. Thirty-seven percent of frontal sinuses had undergone previous sinus surgery. The only exclusion criterion was absence of MT from prior surgery.
Twenty-four (24) patients had bilateral frontal sinus disease (48 frontal sinuses) and 6 patients had unilateral frontal sinus disease, giving a total of 54 frontal recesses were operated. 43.3% (13 patients) of patients had chronic rhinosinusitis (11 bilateral and 2 unilateral frontal sinus affection), 36.7% (11 patients) of patients had bilateral nasal polypi on nasal endoscopy and 20% of patients (6 patients) had fungal sinusitis (2 bilateral and 4 unilateral frontal sinus disease). All patients underwent axillary flap approach to the frontal recess.

Six months post-operatively a follow-up nasal endoscopy was done to all patients to assess middle turbinate lateralization, presence of adhesions in the frontal recess area Fig. (1), ability to pass the endoscope into the middle meatus and recurrence of the disease.

Results

This study included 30 patients. 14 patients (46.6%) were males and 16 patients (53.4%) were females, with male to female ratio 1:1.14. Their age ranged from 15 to 48 years with an average age of 31.5 years. 13 patients (43%) had chronic rhinosinusitis, 11 (36.6%) had bilateral nasal polypi and 6 patients (20%) had allergic fungal sinusitis. 24 patients had bilateral axillary flaps and frontal recess clearance and 6 patients had surgery on only 1 side. Thus 54 axillary flaps were performed in total.

At the end of follow-up period (6 months), all patients were assessed by nasal endoscopy and revealed that the rate of middle turbinate lateralization was 13% (7 sides of total 54 sides) and synechiae in the frontal recess area was 5.6% (3 sides of total 54 sides).

Discussion

The aim of this study was to assess middle turbinate lateralization after axillary flap approach to the frontal recess. Wormald et al., (2014) found that the rate of middle turbinate lateralization was 14.5% and synechiae to the lateral wall occurred at a rate of 12% [3].

In our study we found that the rate of middle turbinate lateralization was 13% and the rate of synechiae in the frontal recess area was 5.6%.

Middle turbinate lateralization is among the most common explanations for endoscopic sinus surgery failure and need for revision surgery [2]. During ESS, the middle turbinate is fractured and medialized to access the maxillary, frontal, and ethmoid sinuses. The middle turbinate is thought to be further destabilized when the ground lamella is penetrated and when frontal recess clearance is performed. Subsequent epithelial damage to the lateral middle turbinate can occur as instruments are passed during surgery. Opposing raw mucosal surfaces predispose to synechia formation resulting in a turbinate lateralization and drainage pathway obstruction [3].

Although complete middle turbinate resection may appear reasonable to prevent lateral wall scarring, this maneuver remains highly controversial. Resection potentially alters normal nasal physiology in air humidification, mucociliary clearance, and direction of airflow. Resection may additionally increase the incidence of frontal sinusitis, [4] a study by Henriquez et al., [5] suggested that partial middle turbinate resection had no significant benefit in reducing postoperative synechiae. Further, the middle turbinate is also an important surgical landmark and a higher risk of complications is observed in the absence of the middle turbinate during revision surgery [6].

In order to prevent lateralization while preserving the middle turbinates, numerous techniques have been described to encourage a medial position. One of the most widely recognized techniques is the controlled synechia technique [7]. Mucosa on the septum and medial aspect of the turbinate were abraded, followed by placement of middle meatus packing to encourage scarring in a medialized position.

Suture conchopexy (or medialization) of the middle turbinates has been performed with prevention of lateralization in upward of 90% of cases [8-10]. Some argue that suture conchopexy is tedi-
ous; thus, efforts have been made to find alternatives to hold the turbinates medially. Metal clips to temporarily fix the meatus to the septum have been used [11]. Although results were positive, there is a concern of aspiration. Similarly, a biodegradable implant was invented to temporarily hold the middle turbinate close to the septum and the turbinates remained in a favorable position [12].

Middle meatal spacers have been used to encourage middle turbinate medialization. Lee and Lee [13] showed that a Silastic sheet placed between the middle turbinate and lateral nasal wall decreased the rate of synechia formation from 44% to 6%. Baguley et al. [14] reported that Silastic splints in the middle meatus reduced adhesions from 27% in unsplinted sides to 0% in splinted sides. FloSeal hemostatic agent in the middle meatus after suture medialization resulted in higher rates of synechia formation [15].

The axillary flap approach to the frontal recess provides excellent access to the frontal recess and allows clearance of cells in the recess with identification of the frontal ostium in the vast majority of cases. The replacement of created axillary flap to cover the raw area of bone prevents scarring and adhesions in the frontal recess which prevents lateralization of middle turbinate [1].

In our study, the overall rate of lateralization was 13% and it is comparable with that reported in the literature.

Conclusion:

In the axillary flap approach to the frontal recess, the mucosal axillary flap covers the exposed bone of the middle turbinate, thereby decreasing contracture and scarring at the frontal recess with overall rate of middle turbinate lateralization 13%, this rate appears consistent with reports in the literature that did not use the axillary flap approach.

References