

Effect of Middle Meatal Spacer in Prevention of Post Functional Endoscopic Sinus Surgery Synechiae - A Prospective Study

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Abstract

Introduction: Middle meatal (MM) scarring is reported as being one of the most common post-operative complications of endoscopic sinus surgery. The incidence of post-operative synechia ranges between 4% and 27%. The severity of scarring varies widely from mild, significant synechia to clinically obstructive disease requiring further surgical intervention. In an attempt to decrease the frequency of this complication, various surgical techniques and MM stents have been designed and used.

Aim: The aim of the study was to study the effect of MM spacer in preventing post-operative complications of endoscopic sinus surgery.

Methods: A non-randomized single-center prospective study was conducted at Rajiv Gandhi Government General Hospital, Madras Medical College among 30 patients undergoing endoscopic sinus surgery. Diagnostic nasal endoscopy was done preoperatively to evaluate the anatomy and pathology of the nasal cavity. Polyvinyl acetate a highly absorbent inert material was used to stent the middle meatus, and it was removed on the 6th post-operative day. Diagnostic nasal endoscopy was done postoperatively to look for any synechiae and other complications. All details of the patient were collected using a pro forma, and the data were analyzed.

Results: Synechiae were present in only 6% of the study population in the 2nd visit, i.e. 1 week after pack removal. These adhesions too were clinically insignificant during the follow-up period. Hence using the bioinert spacer and retaining it for a week is effective in preventing synechiae and the few synechiae that do occur have been clinically silent.

Conclusion: Using the bioinert spacer and retaining it for a week is effective in preventing synechiae and the few synechiae that do occur have been clinically silent.

Key words: Middle meatal spacer, Middle meatal stent, Post functional endoscopic sinus surgery synechiae, Polyvinyl acetate spacer

INTRODUCTION

Middle meatal (MM) scarring is reported as being one of the most common post-operative complications of endoscopic sinus surgery.^[1] The incidence of post-operative synechia ranges between 4% and 27%. The

severity of scarring varies widely from mild, significant synechia to clinically obstructive disease requiring further surgical intervention. In an attempt to decrease the frequency of this complication, various surgical techniques and MM stents have been designed and used. Some authors advocate suture medialization or controlled synechia medialization of the middle turbinate. Others believe partial middle turbinate resection to be beneficial in decreasing the rate of synechia formation.^[2-4] Some advocate placing stents within the ostiomeatal complex. Others place synthetic sponges (i.e. Merocel). However, many questions linger regarding stenting of the MM: Are stents truly beneficial? What is their exact purpose or function? Are they to be used solely as MM spacers? Can

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they catalyze or delay wound healing? Do they promote hemostasis? Other questions pertain to the stent shape and size, whether the stent biomaterial is important, and whether surgical technique influences synechia formation. The purpose of this report is to explore some of these questions.^[5-7]

Aim

The aim of the study was to study the effect of MM spacer in preventing post-operative complications of endoscopic sinus surgery.

MATERIALS AND METHODS

This nonrandomized single-center prospective observational study was conducted at Rajiv Gandhi Government General Hospital, Madras Medical College. 30 consecutive patients operated for chronic sinusitis by functional endoscopic sinus surgery (FESS) using local or general anesthesia. The patients underwent FES Surgery for chronic sinus infections were included.

Procedures

Step 1: Pre-operative plain computed tomography scan of the paranasal sinuses and pre-operative nasal endoscopy.

Step 2: Per-operative nasal endoscopy followed by FESS.

Step 3: MM spacer kept at the end of the surgery.

Step 4: MM spacer removed on the 6th post-operative day followed by nasal endoscopy.

Step 5: Nasal endoscopy 1 week and 1 month after pack removal.

Post-operative Video Nasal Endoscopy

- On the day of pack removal, 6th post-operative day.
- 1 week after pack removal.
- 1 month after pack removal.

Surgery was only decided on if patient's signs and symptoms failed to respond to an aggressive trial of medical therapy (>3 weeks of antibiotics in addition to mucolytics, decongestants). Polyvinyl acetate (PVAc) stent was placed in the middle meatus. During each post-operative visit patients were evaluated through nasal endoscopy for the presence of synechia and or granulation tissue between the middle turbinate and lateral nasal wall. Patients were assessed as well for possible stent-related morbidity, specifically nasal obstruction, headache, and infection. Such symptoms and signs were only considered to be stent-related if present before the first post-operative visit. Patients were required to attend at least 2 of the 3 post-operative visits to be included in the study.

RESULTS

About 40 % of the beneficiaries were in the age group of 21–30 years. No difference in male and female prompt attendance to the post-operative visits noticed. For the 2 patients, with adhesion, it was clinically insignificant during the follow-up period and therefore not lysed. Post-operative infection developed in patients, missing few doses of oral antibiotics and self-administered nasal douching. One patient developed temporary granulation tissue in the middle meatus. One patient developed temporary granulation tissue in the middle meatus [Tables 1-2].

DISCUSSION

Synechia, or scarring, of the sinonasal cavity, has traditionally been considered a complication of sinus surgery, or at least a poor outcome which should be avoided. This belief is evidenced by the numerous spacers and stents designed and marketed to prevent synechia formation after sinus surgery, as well as the many studies which include synechia formation as a primary outcome measure.^[8] Gaskins reported a synechia rate of 10.0% for the nonstented side and 6.7% for the stented side.^[9] MM spacers have shown benefit in decreasing MM adhesions. Data from our study support the literature consensus that MM stents seem to be efficacious.^[3] Synechia rate of 6.6% was observed in our study. Post-operative nasal edema will enlarge the middle turbinate beyond its normal size, therefore, requiring that the stent extend past its anterior and inferior edges for best functional results. The anteroinferior aspect of the middle turbinate and the lateral nasal wall form an anatomic bottleneck to the MM, which during the period of postsurgical edema, is prone to synechia formation due to contact of de-epithelialized mucosal edges. In addition, the surgical technique may play a significant role in reducing the rate of synechia. Minimally Invasive Sinus Technique (MIST), a surgical model that is effective in treating all stages of chronic sinus disease, does not disturb the maxillary birth ostium.^[3] No maxillary antrostomy is performed, and nasal mucosa and nasal turbinates are always preserved. Furthermore, the powered microdebrider tends to result in a more delicate and precise dissection within the nasal cavity. These procedural modifications minimize surgical trauma in the MM. No previous study has reported the incidence of synechia following MIST. It is also noted that synechia, when present following MIST, is rarely clinically significant. This observation may directly relate to the natural position/orientation of the maxillary birth ostium. In most patients, the maxillary birth ostium is oriented either obliquely or horizontally, thereby minimizing the risk of a lateralized middle turbinate causing obstruction. An MM antrostomy,

Table 1: Distribution of post-operative findings

Post-operative findings	Visit 1, 6 th post-operative day, pack removal	Visit 2 1 week after pack removal	Visit 3 1 month after pack removal
Packing injury	Absent	Absent	Absent
Edema	3	Absent	Absent
Post-operative reactionary hemorrhage	Absent	-	-
Post-operative secondary hemorrhage	Absent	Absent	Absent
Blood clot in the middle meatus	Absent	Absent	Absent
Granulation	Absent	1	Absent
Post-operative infection	Absent	2	Absent
Crusting	Absent	2	Absent
Middle Meatus/turbinate collapse	Absent	Absent	Absent
Stenosis of a surgically enlarged maxillary antrostomy	Absent	Absent	Absent
Lateralization of the middle turbinate	Absent	Absent	Absent
Adhesion/synechia	Absent	2	Absent
Contracture	Absent	Absent	Absent
Scar formation	Absent	Absent	Absent

Table 2: Distribution of morbidity

Stent-related morbidity	Number of patients
Nasal obstruction	3
Headache	3
Infection	0

however, creates a parasagittal opening, which is favorably positioned to become occluded from a lateralized middle turbinate or edematous middle meatus. The granulation tissue, post-operative infection, and adhesion resolved by the time of subsequent visit. Many factors contribute to nasal obstruction in the immediate post-operative period, including postsurgical edema, atopy, and infection.

CONCLUSION

The ideal FESS should include preservation of the middle turbinate with a minimal rate of lateral synechia formation. Using the spacer is not a substitute for meticulous technique while performing the operation. Using the bioinert spacer and retaining it for a week is effective in preventing synechia. Few synechia that do occur have been clinically silent. Minimal scarring and granulation help prevent impairment of mucociliary flow patterns. Compressed small compact shape allows quick and easy insertion into the middle meatus. PVAc nasal spacer has porous outer surface and interconnected cell structure producing a packing that is highly absorbent and prevents

blood clot formation. Quickly expands on exposure to fluids to fill the contours of the middle meatus to provide gentle pressure and stop bleeding. Extremely soft when hydrated making removal less traumatic. Drawstrings help retention and easy removal. Normal post-operative regeneration of the mucosa is not affected by the spacer because physiological nasal secretory functions recover.

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