

Comparision between Functional Endoscopic sinus surgery (FESS) versus Endoscopic Modified Denker's approach in Mucormycosis patients

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ABSTRACT

BACKGROUND – This retrospective study aim to compare the surgical benefits between functional endoscopic sinus surgery (FESS) and endoscopic modified Denker's procedure.

METHOD- In this study 100 patients with Rhino-orbito-cerebral Mucormycosis whon underwent for surgical procedure like FESS and Modified Denker's had been included and intraoperative and postoperative outcome of surgery has been compared .

RESULT-Out of 100 patients, 65 underwent Modified Denker's procedure and 35 underwent FESS with mean age group of 35 ± 5 years with 55 males and 45 females with better intraoperative exposure of retromaxillary , infratemporal and pterygoid fossa region in Modified Denker's procedure compared to FESS. Less complications were found in Modified Denker's compared to FESS.

CONCLUSION- Modified Denker's procedure is better compared to FESS to decrease the recurrence rate of Mucormycosis.

KEYWORDS- Modified Denker's, FESS, Mucormycosis, Synechia

INTRODUCTION -

Mucormycosis is a fungal infection caused by a group of molds called Mucormycetes. It mainly affects immunocompromised host and those with comorbidities. It causes angioinvasion, resulting in dissemination, tissue infarction and necrosis. The basic principles of treatment include early diagnosis and initiation of Antifungal therapy and prompt surgical intervention. Though outcome of surgery is difficult to define, control of disease with wide and repeated surgical debridement was done. Surgery is done either by Functional Endoscopic sinus surgery (FESS) or by endoscopic Modified Denker's approach. The surge in cases of Mucormycosis has given opportunity to make comparison between post operative results of Functional Endoscopic sinus surgery (FESS) and endoscopic Modified Denker's approach possible.

OBJECTIVES-

- 1) To study the differences in post-operative outcome in patients treated with conventional antrostomy as compared to those operated by modified denkers procedure.
- 2) To study the post -operative complications in cases operated for debridement in Mucormycosis.
- 3)To study the incidence rate of ease of reexploration in those operated with Functional Endoscopic sinus surgery (FESS) versus those operated with Endoscopic Modified Denker’s approach .
- 4) To study the recurrence rate in those operated with Functional Endoscopic sinus surgery (FESS) versus those operated with Endoscopic Modified Denker’s approach.

MATERIALS AND METHOD-

The study was performed on 100 patients operated for mucormycosis.

Inclusion criteria:

- 1)KOH positive and radiologically proven cases of mucormycosis and those with co-morbidities.
- 2) Clinically obvious cases of Mucormycosis even if KOH negative.

Exclusion criteria:

- 1)Those unwilling for surgery.
- 2)Those patients on Oxygen support and not fit for general anaesthesia or surgery.

The retrospective study was done after approval of ethics committee. Out of 100 patients, 35 underwent Functional Endoscopic sinus surgery (FESS) while 65 underwent endoscopic Modified Denker’s procedure. The postoperative results obtained in patients operated with Functional Endoscopic sinus surgery (FESS) and endoscopic Modified Denker’s procedure were compared. Pre -operative analysis of the CT and MRI scans is essential before the surgery. Retroantrum and pterygoplatine fossa can be easily approachable with Denker’s approach which is involved in 50% of Mucormycosis cases.Despite recent advances in endoscopic techniques the anteroinferior and anterolateral corners of maxillary sinus may be inaccessible endoscopically. With this approach complete exposure of entire maxilla is attained enabling access to ptergopalatine and infratemporal fossa.Caldwell luc approach is required for access of anterior and lateral maxilla.In 1908, Sturman and Canfield introduced endonasal procedure to expose the anterior maxilla.Endoscopic Denker’s approach is performed under endoscopic visualization. Also been referred as Total endoscopic anterior medial maxillectomy (TEAMM).A mucosal incision is made along pyriform aperture along the lower border of upper lateral cartilage. The incision is extended inferiorly with unipolar

electrocautery at the junction of nasal floor and lateral nasal wall. A subperiosteal dissection is performed with a suction freer elevator to expose the anterior maxilla, the infraorbital nerves and its neurovascular bundle as well as lateral nasal wall.

Then, anterior maxillotomy is done endoscopically taking care not to damage the anterosuperior alveolar nerves and infraorbital nerves. The nasolacrimal duct is cut sharply once exposed. Osteotome or drill can be used to create a bony window in the anterior maxilla, taking care to stay inferior to infraorbital nerve. Cut along the roof and floor is made. Maxillotomy may be extended depending on extent of disease. Functional Endoscopic sinus surgery (FESS) is a procedure wherein being less destructive and inferior turbinate was preserved while post-operatively the maxillary sinus floor cannot be examined. The maxillary sinus opening may get blocked by crusting and adhesions being more and chances of recurrences being missed is more. In cases of recurrences the regular debridement being easier in patients operated by Denker's rather than Functional Endoscopic sinus surgery (FESS). The necrotic tissue can be easily be debrided in Denker's approach than those with Functional Endoscopic sinus surgery (FESS). In patients with recurrences, Denker's was done in some patients who were previously operated with Functional Endoscopic sinus surgery (FESS).

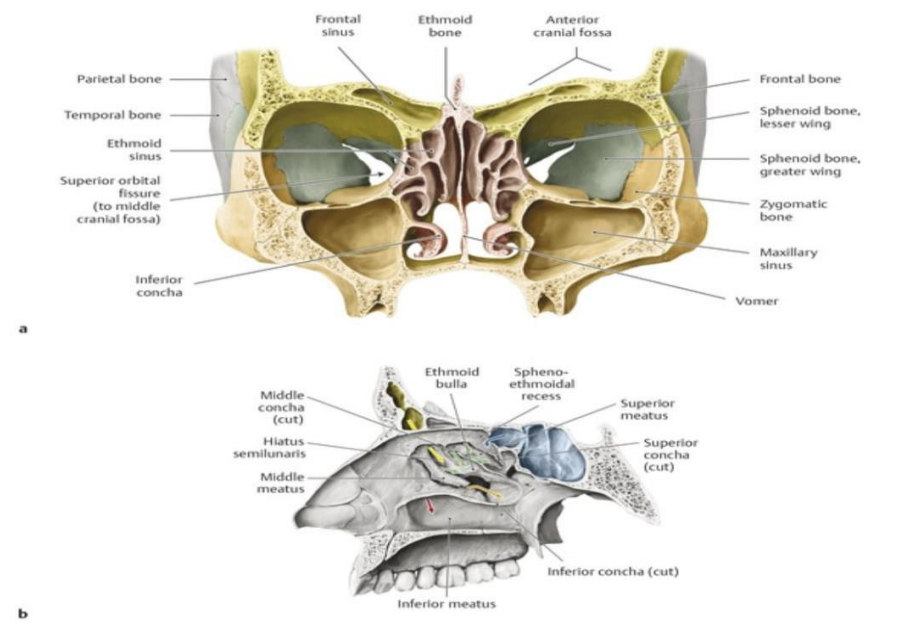


Figure 1- Anatomy of Paranasal Sinuses , A) Coronal view , B) Sagittal view

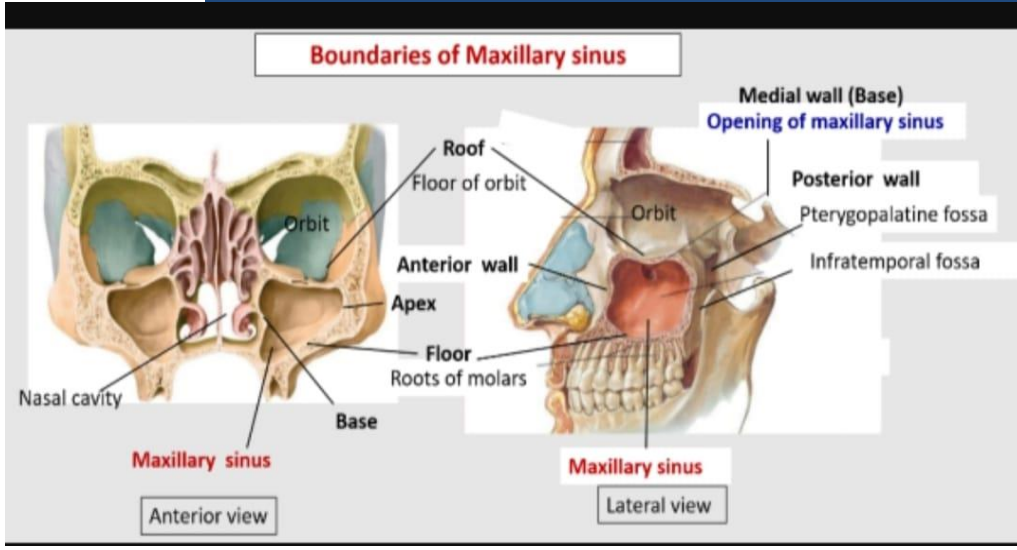


Figure 2- Boundaries of maxillary Sinus, anterior and lateral views

Sinus Surgery

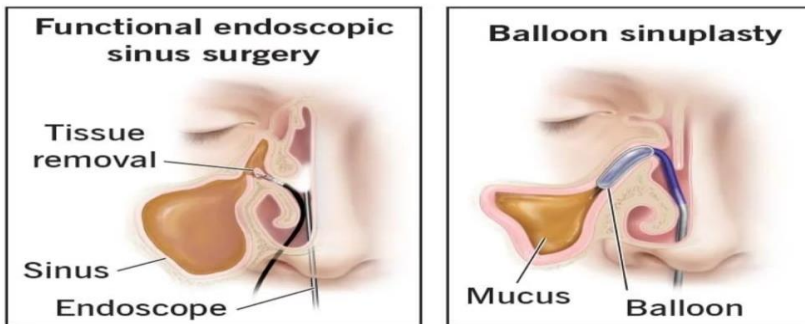


Figure 3- Sinus surgery - Functional endoscopic sinus surgery (FESS)

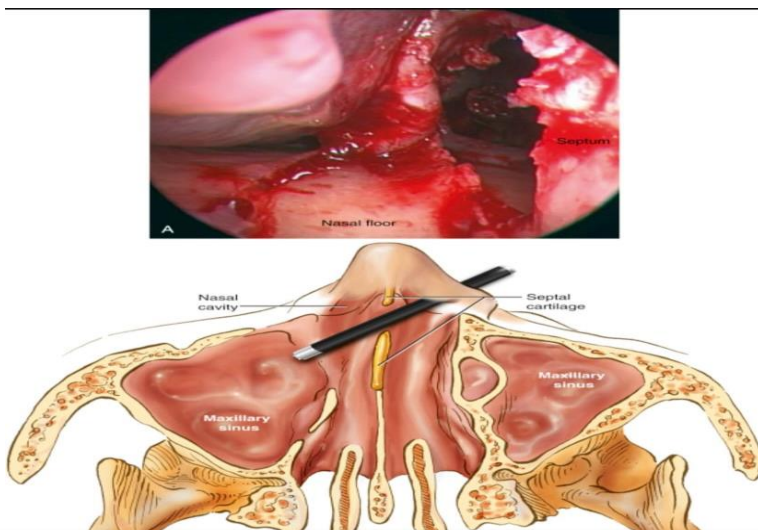


Figure 4- Sinus Surgery – Endoscopic Modified Denker’s

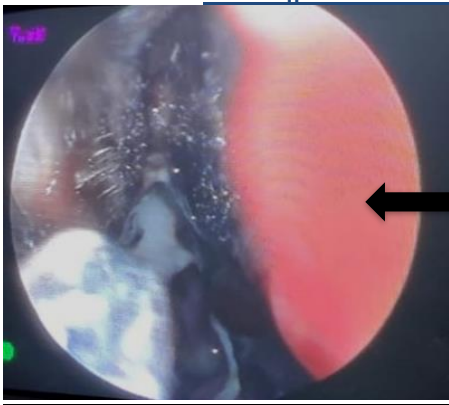


Figure 5- Intraoperative pictures of Mucormycosis in sinuses (Black arrow)

Data Analysis

Our study includes 100 patients of which 65 underwent Modified Denkers procedure and 35 underwent Functional Endoscopic sinus surgery (FESS).

In patients who underwent Modified Denker’s procedure and those in whom Functional Endoscopic sinus surgery (FESS) was done the following results were obtained. (Follow -up period of 6 months)

Parameters	Modified Denker’s approach	<u>Functional Endoscopic sinus surgery (FESS)</u>
INTRA OPERATIVE EXPOSURE TO 1. RETROANTRUM AND PTERYGOID AND INFRATEMPORAL FOSSA 2. ORBITAL DECOMPRESSION 3. OPTIC NERVE DECOMPRESSION	Better	<u>Difficult</u>
INTRA OPERATIVE COMPLICATION 1. HAEMORRAGE 2. INJURY TO ORBIT 3. INJURY TO OPTIC NERVE 4. INJURY TO INTERNAL CAROTID ARTERY 5. CSF LEAK	Less	<u>More</u>
Post-operative OUTCOME	Better	Difficult
Synechia	Less	More
Recurrence	Less	More

Exposure of Retroantrum	Better	Difficult
Revisional surgery	Less	More

Out Of the 100 operated cases of Mucormycosis, 65 patients had undergone Modified Denker’s procedure and the outcome regarding post- operative identification of recurrence and proper examination of retroantrum was easily possible after Modified Denker’s approach. While the same was difficult in patients operated by Functional Endoscopic sinus surgery (FESS). Adhesions and crusting could be easily removed in patients operated by Modified Denker’s approach than those operated by Functional Endoscopic sinus surgery (FESS).

RESULTS-

Parameters	Modified Denker’s approach (65)		Percentage	Functional Endoscopic sinus surgery (FESS) (35)		Percentage
	Present	Absent		Present	Absent	
Post - operative crusting	7	58	10.77%	32	3	91.42%
Recurrence	2	63	3.08%	30	5	85.71%
Revision surgery	2	63	3.08%	28	7	80%
Synechia	3	62	4.61%	29	6	82.85%

DISCUSSION -

Thus in our study comparison between post operative care in patients treated with Modified Denker’s versus those treated with Functional Endoscopic sinus surgery (FESS), it was seen that the chances of recurrence and revision surgery was required more in patients who had undergone Functional Endoscopic sinus surgery (FESS) rather than those operated with modified Denker’s approach.

In a study by Lee et al⁸ there were no cases of post operative epiphora in patients operated with Modified Denker’s approach. In our study too, there were no patients who presented with epiphora during the 6 months period of follow up.

CONCLUSION

Thus, Endoscopic Modified Denker's approach is more preferable than Functional Endoscopic sinus surgery (FESS) for highly invasive fungal Mucormycosis patients for proper exposure of Retroantrum and for complete removal of the disease.

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