

Original research article

A Clinical Study of Chronic Maxillary Sinusitis

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Abstract

Background and objectives: Sinusitis is an exceptionally common disease more so maxillary sinusitis. The objective of the study was to do a comprehensive clinical study of chronic maxillary sinusitis.

Methods: This was a descriptive time bound study conducted between 2020-2021, at the Department of ENT, DMCH, Darbhanga. A total of 70 patients with diagnosis of chronic maxillary sinusitis were included in the study. Among these Inferior meatal antrostomy was performed in 30 patients, Middle meatal antrostomy in 30 patients and Caldwell-Luc's operation in 10 patients. All patients were followed up for a period of six months and improvement in signs and symptoms were documented.

Results: Chronic maxillary sinusitis was commonest in the age group between 20 and 40 years with male preponderance (M:F=1.8:1). The commonest clinical features were nasal discharge (57%), headache (57%), maxillary sinus tenderness (85%), and purulence in middle meatus (50%). X-Ray paranasal sinuses (Water's view) showed air-fluid level in maxillary sinus in 57% of patients. Staphylococcus aureus (48.5%) and Pseudomonas aeruginosa were the common organisms cultured from maxillary antrum of these patients.

Conclusion: Middle meatal antrostomy was an effective surgical treatment for chronic maxillary sinusitis when compared to Inferior meatal antrostomy and Caldwell-Luc operation. **Keywords:** Chronic maxillary sinusitis: Middle meatal antrostomy: Inferior meatal antrostomy: Caldwell-Luc operation.

Introduction

Sinusitis is an exceptionally common disease; more so is the maxillary sinusitis. It is said that maxilla will make its presence 'painfully felt' when infected. The distress gets amplified and starts affecting the socioeconomic status of an individual when it becomes a chronic condition. The disease has a wide-ranging impact on society as well as on quality of life issues as assessed by the Short-Form quality of life survey.¹⁻² The most common cause of Chronic Maxillary Sinusitis is obstruction to the mucociliary drainage from the maxillary antrum. Various modalities of treatment have been proposed such as antral wash/lavage, inferior meatal antrostomy, middle meatal antrostomy, Caldwell-Luc procedure to name a few with proponents of each having their own reasons for individual surgery³. With the advent of endoscopes and its rampant use the trend is towards Functional Endoscopic Sinus Surgery wherein emphasis is laid to assist the normal physiology rather than performing radical procedures. There have been a number of studies around the globe on various aspects of sinusitis, comprehensive clinical study of Chronic Maxillary Sinusitis are rare. Our present

study is one such attempt to do a 'clinical study of chronic maxillary sinusitis' in this part. In this study anatomy, physiology, etiopathogenesis, clinical features of Chronic maxillary sinusitis are reviewed and management of all such cases mainly with three operative procedures such as Inferior meatal antrostomy, Middle meatal antrostomy, and Caldwell–Luc's procedure⁴. Efficacy of each of these operative procedures in terms of postoperative improvement has been documented and analysed.

Objectives

To study the etiological factors and clinical manifestations of chronic maxillary sinusitis.
To analyse and compare various modalities of treatment in chronic maxillary sinusitis.

Material and methods

This clinical study of chronic maxillary sinusitis was conducted Between 2020-2021 in the Department of ENT Darbhanga Medical College and Hospital Darbhanga Laheria sarai, Bihar. Amongst the patients attending OPD, 70 patients with a diagnosis of Chronic maxillary sinusitis as per following criteria were included for the study.

Inclusion criteria

Patients presenting with clinical features of chronic maxillary sinusitis not resolved after 3 months of intensive medical management.

Patients aged between 11 and 60 years including both sexes.

Exclusion criteria

1. Patients with any previous nasal surgical procedures done.
2. Patients whose general condition is poor – Immunocompromised, and neoplasms.

A detailed evaluation of these patients was done as per the proforma and results were evaluated. Radiological examination of paranasal sinuses (Water's view) was done. Diagnostic antral lavage was done in each patient and the lavage results were noted and lavage was sent for culture and sensitivity. The correlation between radiological findings and antral lavage results were evaluated.

Among the patients surgical procedures were The follow up was done regularly at 1 month, 3 months and 6 months. The postoperative improvement was assessed by direct questioning and examination of the patients with particular reference to preoperative clinical symptoms and signs. individualised and following procedures were done. Intranasal / Inferior Meatal antrostomy in 30 patients, Middle meatus antrostomy in 30 patients and Caldwell-Luc's procedure in 10 patients.

Results

Table 1: Age wise distribution:

Age (yrs)	Present study	% In presentstudy
11-20	10	14
21-20	22	31
31-40	30	43
41-50	6	9
51-60	2	3

In the present study majority of the patients i.e., 74% belonged to age group between 21 and 40 years

Table 2: Sex wise distribution:

Sex	Present study(n=70)	Percentage
Male	45	65
Female	25	35

Male: Female = 1.8:1

Majority (57%) of the patients had nasal discharge, headache and post nasal drip as the major complaint preoperatively followed in order decreasing frequency by facial pain (42%), halitosis (25%), hyposmia (28%)..

Table 3:

Sl.No.	Symptoms	Present Study (n=70)	Percentage(%)
1	Nasal Obstruction	20	28
2	Nasal discharge	40	57
3	Headache	40	57
4	Facial Pain/Pressure	30	42
5	Hyposmia/Anosmia/Cachosmia	20	28
6	Sneezing	10	14
7	Epistaxis	6	8.5
8	Cough	12	17
9	Halitosis	18	25
10	Sore throat / Post nasal drip	35	50

Most of the patients presented with the above complaints for a duration of 6 months to one year. Among these patients the chief complaints were nasal discharge in 60 % and post nasal drip in 75 %. In patients presenting with symptom duration of more than one year the chief complaints were nasal obstruction and heradache.

Table 4: Radiological analysis of Paranasal sinuses (Water's view)

Radiological finding of Maxillary sinus	Present study	Percentage
Haziness	17	24
Air fluid level	40	57
Mucosal Thickening	13	19

It is evident from above table that 57% of patients had air fluid level in the maxillary sinuses bilaterally, while 24% of them had haziness. The rest of the patients (24%) had mucosal thickening in maxillary sinuses.

Table 5: Bacteriological patterns found in chronic maxillary sinusitis:

Bacteria	No.	%	Drug Sensitivity				
			Cipro-floxacin	Erythro-mycin	Genta-mycin	Cefta-zidime	Cef-perazone
Staphylococcus aureus	34	48.5	S	S	S	S	S
Pseudomonas aeruginosa	18	25.7	S			S	
Klebsiella Sp.	6	8.5	S		S		
Streptococcus Pneumoniae	5	7.1	S		S		
M.Catarrhalis	2	2.8	S		S		
Citrobacter	1	1.4	S			S	S
No Growth	4	5.7					

The antral wash returns under aseptic precautions sent for culture and sensitivity. Only aerobic bacterial cultures were done since facilities for growth of anaerobic organisms were not available at our institution. Commonest organism isolated was *Staphylococcus aureus* (48.5%), second in incidence was *Pseudomonas aeruginosa* (25.7%). No growth of any organisms noted in 5.7% of cases. Most of the organisms cultured were sensitive to Ciprofloxacin (and other quinolones), to a lesser degree to Gentamycin, Erythromycin, Ceftazidime, and Cefperazone. *Staph. aureus* was mainly sensitive to ciprofloxacin and *pseudomonas* to Ceftazidime. By the end of one month among the patients who had undergone MMA the overall improvement in clinical signs and symptoms was 70%, by three months it was 80% which raised to 94% at the end of six months. Among the patients who had undergone Caldwell-Luc procedure, the overall improvement in the clinical signs and symptoms at the end of one month was 37%, by three months it was 63 and by the end of six months it was 80%. The results of all the three operative procedures were analysed statistically and "Coefficient of variation"(CV) was calculated by taking the overall improvement in signs and symptoms at the end of six months. According to this test CV for INA was 11.66%, for MMA- 7.33% and for C-L procedure it was 16%. Thus MMA was found to be a better operative procedure compared to other two in terms of postoperative improvement in signs and symptoms at the end of six months. The same data was also analysed using "student 't' test, to test the efficacy among the operative procedures. When INA and MMA were compared and computed using above test 'p' value was less 0.05 (with $t=3.170$), which was quite significant Thus it can be inferred that MMA was superior to INA in terms of postoperative improvement in signs and symptoms.

Discussion

Table 6: Age wise distribution:

Age (yrs)	Sadhana et.al(n=32)	Present study	% in presentstudy
11-20		10	14
21-20	15	22	31
31-40	4	30	43
41-50	2	6	9
51-60	1	2	3

In a study conducted by Sadhana et.al., majority of the patients were in the age group between 11 and 30 years. In a similar study by Defreitus and Lucente, CMS occurred more often between the ages of 30 and 60 years accounting for 64% of the total. In our study most of the patients were of the age between 21 and 40 years which correlated well with the above study. In a study conducted by Sadhana R.Nayak the commonest symptoms of presentation was nasal discharge(80%), nasal obstruction (70%) and headache(70%). Howard L.Lewis et.al., in their report on 250 patients quote the following picture of nasal obstruction (31%), nasal discharge (51%), headache (36%). Our study correlates well with the latter one. In addition headache and facial pain/pressure were also present in significant group of individuals accounting for 57% and 42% respectively. The forementioned studies have also not taken into consideration other symptoms such as sneezing, epistaxis, cough, halitosis, and PND while our study included those symptoms also. In a study by Sadhana et.al., nasal discharge in middle meatus and maxillary sinus tenderness were the major clinical signs in 68% and 40% respectively. In a similar study by Thomas et.al., maxillary sinus tenderness was observed in 62% of patients. Our study quotes findings similar to the above two with maxillary sinus tenderness in 85% of patients and nasal discharge in 50% patients. Besides PND was present in 50% of patients.

Table 7: Correlation between X-ray findings of maxillary sinus with Antral wash

Radiological finding	Haziness		Air fluid level		Opaque	
	M.K.Sen (%)	Present study (%)	M.K.Sen (%)	Present study (%)	M.K.Sen (%)	Present study (%)
Clear Antral wash	75	47	52	30	20	16
Mucoid Antral wash	12.5	17	22	10	45	76
Mucopurulent Antral wash	12.5	30	6	45	5	8
Purulent Antral wash	0	6	20	15	30	0

On comparing present study with a similar one done by M.K.Sen, it is evident that slight haziness of maxillary sinus was associated with mainly clear antral wash returns, so was the case in our study wherein majority of maxillary sinuses(47%) slight haziness had clear antral wash(AW) returns. In the same group we found 30% patients with mucopurulent AW returns, which was almost, double that in the present comparative study. In patients showing air fluid level in maxillary sinus on X-ray PNS we found 45% patients had mucopurulent AW returns while M.K.Sen's study showed contrasting picture with only 6 % of such patients having mucopurulent AW returns and 52% having clear AW returns. Complete opacity of maxillary sinus was associated with mainly mucoid AW in majority (75%), which correlated well with that of M.K.Sen's study though the percentage being less. Aral M, Keles E, Kaygusuz I,⁵ studied the microbiology of ethmoid and maxillary sinuses in 42 patients with chronic sinusitis and the most common isolated aerobic bacteria were Staphylococci. Isolated aerobic bacteria rate was 90.4% and isolated anaerobic bacteria rate was 14.2%. The aerobic bacterial yield correlated well with that of our study results. Brook I and others⁶ cultured the organisms from maxillary antrum of 66 patients and isolated mainly anaerobes especially peptostreptococcus in 56 cases. Among the aerobes Staphylococcus aureus was the predominant organism, which was in lieu with our study result. Since there was no facility for

anaerobic culture at this institution that part was not undertaken. Ochi K and others⁷ did a study to evaluate the patency and effectiveness of inferior meatal antrostomy for the treatment of CMS on thirty sides of 27 patients. They found good postoperative improvement of 86.7% of individuals. This correlated well with our study wherein the overall symptom score improvement postoperatively was 77% at the end of six months follow-up. Zhou B and others⁸ did a comparative study between MMA and INA and found a success rate of 86.7% with MMA and 54.7% with INA. Our study 94% success rate with MMA and 77% success rate INA thus complimenting the above study which concluded that antrostomy of middle meatus was better than that of inferior meatus. A similar study by Arnes E and others⁹ who performed Inferior meatal antrostomy on one side and Middle meatal antrostomy on the other sinus of same individual in a series of 38 adult patients and found no significant difference in terms of symptoms and clinical findings postoperatively. This study has been quoted here to highlight the differing opinions of different study groups at different periods. Salam MA and others¹⁰ did a prospective study of 51 patients with chronic maxillary sinusitis who had 90 MMA procedures and found satisfactory results in 80% of individuals which correlated well with our study. Besides they also stated that there was a significant relationship between the degree of patency and level of improvement postoperatively. Since our study was a limited time bound study of one year we could do long-term patency follow up. A similar study by Davis WE and others evaluated the patency of MMA in a 24 months follow up period and found that the overall patency rate of Endoscopic MMA was 94.08% assessed while postoperative Questionnaire data showed 91.8% improvement in symptoms. Narkio-Makel M and others¹¹ did a study similar to present one on 260 patients (424 sinuses) comparing the efficacy of Endoscopic sinus surgery with Caldwell-Luc operation in the treatment of chronic maxillary sinusitis and found that that C-L operation was more efficacious compared to FESS with a success rate of 95.2% in C-L group and 63% in MMA group.

Conclusion

Evaluation of chronic maxillary sinusitis should include X-ray of paranasal sinuses. Middle meatal antrostomy is a safe and efficient method for dealing with chronic maxillary sinusitis with high success for alleviation of symptoms and improvement of disease with negligible morbidity.

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