

# A Clinical Study of Different Modalities for the Management of Chronic Maxillary Sinusitis

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## ABSTRACT

**Background:** Chronic maxillary sinusitis is a very common presentation in otorhinolaryngology clinics. It has diverse aetiology and varied symptoms at presentation. Its treatment requires a comprehensive approach for successful outcomes. We in the present study tried to evaluate the aetiology of chronic maxillary sinusitis and outcomes of treatment of chronic maxillary sinusitis.

**Methods:** Patients presenting with clinical features of Chronic rhinosinusitis of all age groups and sexes were included in the study. The patients were subjected to general examination from head to toe which included the examination of the Respiratory system and cardiovascular system. ENT examination along with head neck was done. X-Ray (Water's view), C.T Scan PNS-Coronal, and Sagittal sections for selected patients.

**Results:** Antibiotics, antihistamines, decongestants, steam inhalations, and in some cases intranasal steroids (Budesonide, Beclomethasone, Fluticasone). Surgery: Antral wash n=16 cases, Intranasal Antrostomy n=2 cases, Caldwell Luc n=2 cases, Maxillary sinoscope n=2 cases, FESS n=38 cases involving uncinatectomy, middle meatal antrostomy, anterior ethmoidectomy, posterior ethmoidectomy, sphenoidotomy, frontal sinus infundibulotomy, and polypectomy.

**Conclusion:** The commonest organism responsible was streptococcus pneumoniae. Improvement in the diagnostic techniques and availability of nasal endoscopy and CT scan which can show clearly the anatomy of osteomeatal complex has led to better management of the disease. Nasal endoscopes have allowed a meticulous delicate removal of the diseased mucosa which preserving the normal mucosa and structures consequently the postoperative complications are very few and most of the cases get relief from the symptoms of the disease.

**Keywords:** chronic maxillary sinusitis, Antral wash, Functional Endoscopic sinus surgeries

## INTRODUCTION

The terms 'Rhinosinusitis' refers to a group of disorders characterized by inflammation of the mucosa of the nose and paranasal sinuses. Chronic rhinosinusitis is diagnosed when the duration of symptoms lasts greater than 12 weeks. [1] Chronic maxillary sinusitis is the most common form of sinusitis. It is an extremely prevalent disorder that has a significant impact on the quality of life of an affected individual. The causes can be anatomical, physiological, or pathological which ultimately obstructs the free drainage from sinuses causes stasis, and predisposes to infections. Maxillary sinuses are fully dependent on the patency of the anterior ethmoidal region because their ventilation and drainage pass through complicated fissures and narrow compartments. [2] It has been estimated that 24 million people are affected by sinusitis annually. [3] The prevalence of sinusitis (146/1000) has been reported to exceed that of any other chronic condition and is apparently on the rise. It is estimated that between 30 and 50% of all patients seen by the family practitioner suffer from some form of rhinosinusitis. [4] In the USA 20% of outpatient antibiotic prescriptions are due to acute or chronic sinusitis. [5] Symptoms of chronic sinusitis are non-specific and may be misleading they are attributed to sinonasal inflammation which is marked by nasal congestion, nasal stuffiness, nasal airway obstruction, and decreased sense of smell and taste. Facial pressure or facial pain may be present along with fatigue malaise, ear pressure, and maxillary dental pain or headache. Based on the clinical examination the cases are sometimes divided into cases with polyps and cases without polyps. The presence of polyps is known as chronic hyperplastic sinusitis causes of it can be ranging from allergy, dusts pollen, environmental factors, bacterial infections. Non allergic factors such as vasomotor rhinitis can also cause chronic sinus

problems.[6] Infection of adenoids and tonsils may spread into the sinuses. With the increase in the incidence of HIV/AIDS, Diabetes, and various other immune suppressor diseases, the incidence of bacterial especially fungal rhinosinusitis is becoming a challenging problem for an ENT Surgeon. Dental infections or extraction of the tooth may cause infection of maxillary antrum from dental canal root. Swimming and diving may cause the direct spread of materials from the nose through the ostium into paranasal sinuses. Fractures involving sinuses may be followed by sinusitis by either direct spread through the fracture site or infections of a blood clot. With the advent of endoscopic anatomy and pathophysiology of the nose and paranasal sinuses, the treatment of sinus disease assured excellent results with less recurrence. There are various modalities of treatment based on the diagnosis of etiological factors treated with medical management or surgical management. The various surgical forms of treatment have been divided for this condition such as Antral wash, Intransal antrostomy, Caldwell- Luc, FESS. We in the present study tried to evaluate the various modalities of treatment and outcomes in patients with chronic maxillary sinusitis.

#### Material and Methods

This cross-sectional study was conducted in the Department of Otorhinolaryngologyof Prathima Institute of Medical Sciences, Karimnagar, Telangana State. Institutional ethical committee permission was obtained for the study after following the protocol for human studies. Written consent was obtained from all the participants of the study after explaining the nature of the study. Sample size calculation was done with formula  $4pq/d^2$ , the following values were used. Confidence Interval 90%, Margin of Error 8%, the proportion of the population affected by the disease is approximately 15% the calculated sample size was 55 we included n=60 cases in our study.

#### Inclusion Criteria

1. Patients presenting with clinical features of chronic rhinosinusitis of all age groups and sexes.
2. Those who were voluntarily willing to participate in the study.
3. Those who were available for follow-up examinations.

#### Exclusion criteria

1. All patients presenting with clinical features other than sinusitis.
2. All cases of chronic rhinosinusitis involving other than maxillary sinus.

3. Previous cases of chronic rhinosinusitis with postoperative complications.

4. Patients presenting with acute sinusitis.

After the selection of the patient a complete history of present illness including the history, and the family history was noted, and the demographic profile of the patient was recorded. The patient was subjected to general examination from head to toe which included the examination of the Respiratory system and cardiovascular system. ENT examination along with head neck was done.

**Investigations:** All the n=60 patients were subjected to clinical examination and investigated by the following methods.

**Haematological:** Baseline hematological investigations like Hb%, total WBC counts, differential count, E.S.R, bleeding time, clotting time, platelet count,R.B.S/F.B.S, blood urea, A.E.C, HBsAg, HIV were done for all patients. Radiological: X-Ray (Water's view), C.T Scan PNS-Coronal, and Sagittal sections for selected patients. Diagnostic Nasal EndoscopyHistopathology: H.P.E of tissue obtained during surgery. Microbiology: Culture and sensitivity for bacteria and fungus.

**Management:** Antibiotics, antihistamines, decongestants, steam inhalations, and in some cases intranasal steroids (Budesonide, Beclomethasone, Fluticasone). Surgery: Antral wash n=16, Intransal Antrostomy n=2, Caldwell Luc n=2, Maxillary sinoscope n=2, FESS n=38 involving uncinatectomy, middle meatal antrostomy, anterior ethmoidectomy, posterior ethmoidectomy, sphenoidotomy, frontal sinus infundibulotomy, and polypectomy.

**Postoperative:** Antibiotics for 7-10 days, antihistamines for 10-15 days, nasal douching, steam inhalations, intranasal steroids (Budesonide, Fluticasone) for 1-2 months. Postoperative systemic steroids (Prednisolone - tapering dose for 10-15 days in some cases). Follow-up: Patients were followed twice weekly for the first 2 weeks, once a week for the next 2 weeks, once a month for 6 months. At each visit, the examination was done.

#### Results

Out of the n=60 cases n=33 (55%) were male patients and n=27(45%) were female patients. The youngest case in the study was 15 years and the oldest was 59 years. Most of the cases in both males and females were from the age group 21–30 years indicating that this group is most affected by the disease given in table 1.

**Table 1:** Demographic profile of the cases included in the study

Age group	Male (n)	Female (n)	Total (n)	Percentage
15 – 20	04	01	05	08.33
21 – 30	15	16	31	51.67
31 – 40	06	05	11	18.34

41 – 50	05	03	08	13.33
51 – 60	03	02	05	08.33
Total	33	27	60	100

The common cause of seeking medical care was symptoms of headache, nasal obstruction and nasal discharge is greater than 90% of cases and 61.67% also reported with pharyngeal infections. In this study, the duration of symptoms

in 31 cases was from 6–9 months intermittently. 10 cases had a duration greater than 12 months and 6 cases had a duration of >18 months details shown in table 2.

**Table 2:** symptoms recorded in the cases included in the study

Symptoms	Frequency (n)	Percentage (%)
Nasal discharge	55	91.67
Nasal obstruction	56	93.33
Post-nasal discharge	45	75.00
Epistaxis	17	28.33
Hyposmia/anosmia	15	25.00
Pharyngeal infections	37	61.67
Headache	58	96.67
Orbital symptoms	02	03.30
Respiratory tract infections	05	08.30
sneezing	06	10.00
Dental problems	03	05.00
Mouth breathing/snoring	03	05.00

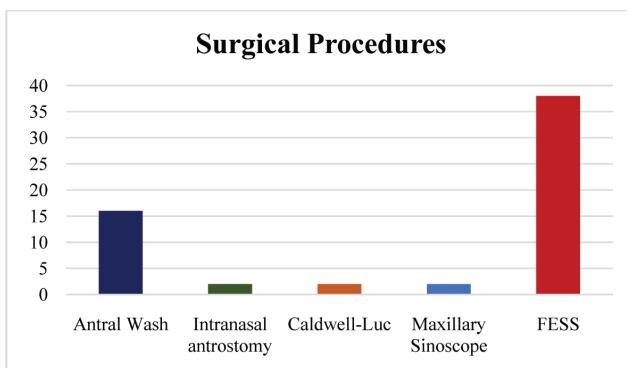
After the ENT examination of the selected cases, half of the cases had deviated nasal septum which was the cause

of chronic sinusitis. There was hypertrophy of inferior turbinate in 46% of cases and other abnormalities were found ranging from 3% - 5% in the cases as shown in table 3.

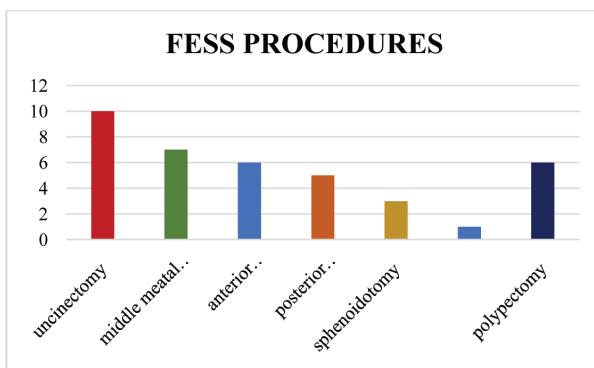
**Table 3:** Signs recorded in the cases included in the study

Signs	Frequency (n)	Percentage (%)
Deviated Nasal septum	31	51.67
Hypertrophy inferior turbinate	28	46.67
Bilateral polyps	03	05.00
Unilateral polyps	02	03.33
Antrochoanal polyp	05	08.33
Pan Sinusitis	03	05.00
Dental origin	04	06.67
Adenoid hypertrophy	03	05.00

Bacteria	Frequency (n)	Percentage (%)
Staphylococcus aureus	02	03.33
Streptococcus pyogenes	01	01.67
Streptococcus pneumonia	17	28.33
Hemophilus influenza	15	25.00
Moraxella catarrhalis	07	11.67
Pepto streptococcus	01	01.67
Fuso bacteria	01	01.67
Fungal aspergillus	01	01.67
No growth	15	25.00

**Figure 1:** Showing the surgical procedures undertaken

In n=38 cases Functional Endoscopic sinus surgeries were done antral wash was done in n=16 cases, intranasal antrostomy in n=2 cases, Caldwell Luc operation in n=2 cases, maxillary sinoscope surgery in n=2 cases given in figure 1.Uncinectomy in n=10 cases, middle meatal antrostomy in n=7 cases, anterior meatal antrostomy in n=6 cases, posterior meatal antrostomy in n=5 cases, sphenoidotomy in n=3 cases frontal sinus surgery in n=1 case, and polypectomy in n=6 cases given in figure 2.

**Table 2:** Functional Endoscopic sinus surgery procedures

Postoperative complications distribution: No major postoperative complications were noted in the postoperative period. The minor postoperative complications include synechiae formation which was noted in n=3 patients (5%) who have undergone FESS at the end of the 2nd week and the incidence dropped to 0% by the end of the 12th week.

### Discussion

Rhinosinusitis presents with variable clinical features in patients depending upon the actual pathogenesis underlying the disease. The present study is an attempt to determine the clinical features, application of required diagnostic criteria used by various authors, correlate the radiological features with the clinical signs, and per-operative findings. Nasal smears, Nasal swabs, and tissue collected during the surgery were subjected to laboratory study to arrive at the diagnosis. An attempt was also made to study the role of various treatment modalities used during the management of the disease. Out of the n=60 cases, the youngest case in the study was 15 years and the oldest was 59 years commonly affected age group was 21- 30 years. According to McNeil RA et al; [7] the maximum age incidence was in the 4th decade. While in the studies by Vuorinen P et al; [8] Axelsson AA et al; [9] M Kurien et al; [10] found the highest incidence in the 20-29 age group (3rd decade) agreeing with the observations of the present study. In this study, we found 55% were male patients and 45% were female patients. In the current study symptoms of headache 96.67%, nasal obstruction in 93.33%, and nasal discharge in 91.67% of cases. In SR Nayak et al; [11] study the commonest symptom was nasal discharge followed by headache and nasal obstruction. Nasal obstruction was the commonest symptom (96%) followed by postnasal drip (92%) & facial pain/headache (90%) in the study by Mathews BL et

al;<sup>[12]</sup>and Fageeh NA et al;<sup>[13]</sup>study the commonest complaint was nasal obstruction (76%), headache (74.4%), anosmia (56.5%) & facial pressure/pain (50%).In our study deviated nasal septum was seen in 51.67% of cases. Maru YK et al;<sup>[14]</sup>found deviated nasal septum in 55.7% of cases and Asruddin et al;<sup>[15]</sup> found in 38% of cases. Jareoncharsri P et al;<sup>[16]</sup>septal deviation is obvious in 60(72.3%) of the patients out of 83 cases on DNE. In the current study, we found the commonest organism isolated from the secretions to be *Streptococcus pneumoniae*(28.33%). Brook I et al;<sup>[17]</sup>identified chronic rhinosinusitis in the aspirations of sinus secretions by endoscope from 80 patients in their study, demonstrating the *Streptococcus pneumoniae* is the commonest bacterial cause.Gwaltney JM et al;<sup>[18]</sup>found *Streptococcus pneumoniae* (20-45 %)and *Haemophilus influenzae* (22-35 %) are the predominant organisms in acutebacterial rhinosinusitis in adults.In the present study, all patients received Preoperative Antibiotics, Antihistamines, decongestants, steam inhalations, and in some patients transnasal steroids (Budesonide, Beclomethasone, Fluticasone).In this study, n=38 cases underwent FESS surgery and postoperatively n=30 (78.95%) cases have significant improvement and relief from symptoms of chronic sinusitis.Behin F et a;<sup>[19]</sup> patients underwent FESS surgery 83% of patients no longer complained of headache and 8% had significant relief. A study conducted by Parsons DS et al;<sup>[21]</sup> on 34 patients who underwent FESS surgery reported a reduction in intensity in 91%of patients and a reduction in the frequency of headache in 85% of patientspostoperatively.No major postoperative complications were noted in the postoperative period. The minor postoperative complications include synechiae formationwhich was noted in n=3 patients (5%) who have undergone FESS at the end of the 2nd week and the incidence dropped to 0% by the end of the 12th week. A study by K J Jacob et al;<sup>[21]</sup>found Synechiae formation between the middle turbinate at the end of 2 weeks and long-term follow-up showed normal endoscopic findings.

### Conclusion

Under the limitations of the current study, it was found chronic maxillary sinusitis affects all age groups and however predominantly found in the 3rd decade. The commonest organism responsible was streptococcus pneumoniae. Improvement in the diagnostic techniques and availability of nasal endoscopy and CT scan which can show clearly the anatomy of osteomeatal complex has led to better management of the disease. Nasal endoscopes have allowed a meticulous delicate removal of the diseased mucosa which preserving the normal mucosa and structures consequently the postoperative complications are very few and most of the cases get relief from the symptoms of the disease.

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