

Endoscopic and conventional surgical treatment of chronic rhinosinusitis

By Sabeeh Allawi Zayer Aldayyeni

Endoscopic and conventional surgical treatment of chronic rhinosinusitis

Sabeeh Allawi Zayer Aldayyeni, Mukdam Hussein Abd Alzahra Alebady, Sadiq Musa Ahmed

Department of Surgery, Faculty of Medicine, University of Misan, Misan, Iraq

13
Corresponding author:

Sabeeh Allawi Zayer

E-mail: Medicalresearch79@yahoo.com

8 ABSTRACT

Background: Although endoscopic sinus surgery has now become a well-established surgical procedure for the treatment of chronic rhinosinusitis not responding to medical treatment. Conventional surgery still been practice by some surgeon .therefore its worthy to study and evaluate both methods.

Objective: to assess the effectiveness of endoscopic versus conventional surgery in the treatment chronic maxillary sinusitis.

Method: A prospective comparative study on 45 cases with chronic maxillary sinusitis refractory to medical treatment with different age and sex were studied from period January to December 2023 at AL-Sadder hospital. About 25 underwent conventional surgery and 20 underwent endoscopic sinus surgery. They were submitted for full history, clinical, endoscopic examination, radiological evaluation and post-operative fellow up for six months.

Results: Male: female ratio 1.5:1. incidence of chief complaint was nasal obstruction 62%, facial pain 13%, nasal discharge 11% and headache 9%. P-value of 1st month post-operative symptoms score was> 0.05, P-value for 2nd-6th month post-operative period symptoms score (facial pain & nasal discharge) was<0.05. Adhesion occur in 20% in endoscopic surgery and 4% in conventional surgery, while bleeding in 5% in endoscopic surgery and 12% in conventional surgery.

Conclusion: Chronic sinusitis affects mainly young age groups, nasal obstruction is the most common presentation followed by facial pain, nasal discharge and headache. Conventional surgery is effective when predisposing factor for sinusitis as septal deviation while endoscopic is effective when theirs osteomeatal unit obstruction.

Keyword: chronic rhinosinusitis, endoscopic sinus surgery, nasal obstruction, paranasal sinuses, otolaryngological examination

INTRODUCTION

¹ Rhinosinusitis is broadly defined as a group of disorders characterized by inflammation of the nose and paranasal sinuses. The classification by the duration of an inflammatory episode includes: Acute (up to 4 weeks), subacute (4–12 weeks), and chronic (> 12 weeks). Additional categories include recurrent acute rhinosinusitis (four episodes per year without evidence of chronic rhinosinusitis) and acute exacerbations of rhinosinusitis. Chronic rhinosinusitis may be subclassified as chronic rhinosinusitis with or without nasal polyps and with eosinophilic or noneosinophilic histologic features [1]. It affects ² more than 30 million Americans of all ages. Despite the enormity of the problem, the pathophysiology of this disease still eludes the scientific community. Three factors, however, appear as crucial for the normal physiologic functioning of the sinuses: a) ² patency of the ostiomeatal unit (OMU); b) normal mucociliary transport, and c) ² normal quantity and quality of secretions. Disruption of one or more of these ³ factors can predispose to sinus infection [2].

Bacteriology of it is the same organisms found in acute disease are also prevalent in chronic rhinosinusitis. The following pathogens are more frequently associated with chronic rhinosinusitis: *S. aureus*, *Pseudomonas aeruginosa*, *Proteus* species, *Enterobacter* species, *Klebsiella* species, coagulase-negative *Staphylococcus* species, and possibly anaerobes. Generally speaking, gram-negative rods and staphylococcal species become more important pathogens in cases with CRS [3, 4]. ¹² The study aimed to assess the effectiveness of endoscopic versus conventional surgery in the treatment of chronic maxillary sinusitis.

METHODS

A prospective and comparative study was carried out on 45 cases with chronic sinusitis treated by several surgical at otolaryngology department of AL-Sadder teaching hospital for specialized surgery from January to December 2023.

Inclusion criteria

1. Cases with rhinosinusitis symptoms >12 weeks.
2. No response to medical treatment.
3. Endoscopic or radiological evidence of rhinosinusitis.

Exclusion criteria

1. Immune suppression²
2. Systemic diseases as cystic fibrosis or Wegener's disease.
3. Previous sinus surgery.
4. Sino nasal malignancy

Pre and during operative and follow-up

About, 25 case subjected to conventional surgery group A and 20 case subjected to endoscopic surgery group B. A questionnaire formula was prepared for data collection regarding pre and post-operative aspect of each case. We focused on age, sex, residence, occupation, symptoms and clinical finding after thorough otolaryngological examination and CT scan. Anesthesia: all procedures done under general anesthesia with hypotensive technique application of local vasoconstrictor (adrenaline 1:1000) pharyngeal pack inserted for all case. Case is laid supine on the table, head up 15° the nose examined by three passes, inferior, middle, superior (this done in case of endoscopic method while those with conventional methods preoperative endoscopic examination outcase clinic). For endoscopic surgery the Hopkins rigid endoscopes 4mm in diameter were used with different angle 0°, 30°, 70°, while those with conventional surgery endoscopic examination done at outcase clinic. Cases of group A underwent inferior meatal antrostomy± other conventional procedures according to case (septoplasty, anterior ethmoidectomy, conchoplasty, polypectomy). All case of group B underwent uncentomy + middle meatal antrostomy± other procedures (endoscopic septoplasty, anterior ehmoidectomy, conchoplasty, polypectomy).

Postoperative

The case were discharged home on the next day, all case were given one week course of oral antibiotics, local steroid drops warm saline irrigation Follow up was for six months using Lund and MacKay scoring system by visual analogue scale of ten degrees from 0-10, 1st visit one week post-operative, 2nd visit three weeks, 3rd visit two month, 4th visit four month and 5th visit six month post-operative. In each visit examination done care of nasal cavity such as suction removal of crust division of adhesion.

RESULTS

Forty five cases were included who suffer from chronic rhinosinusitis uncured by medical treatment. Twenty five cases treated with conventional surgery while twenty cases treated with endoscopic

surgery. As shown in table (1) most common age incidence in young age groups (21-30) and (31-40). Figure (1) showed male: female 1.5:1. In order frequency duration of illness was 1-2 years followed by 2-4 years as shown in table (3).

Table (1) age and sex incidence in cases with chronic rhinosinusitis

Age(years)	male	Female	Total	%
11-20	6	4	10	22
21-30	9	6	15	33
31-40	8	4	12	27
41-50	4	3	7	16
51-60	1	0	1	2
Total	28	17	45	100
%	62	38	100	

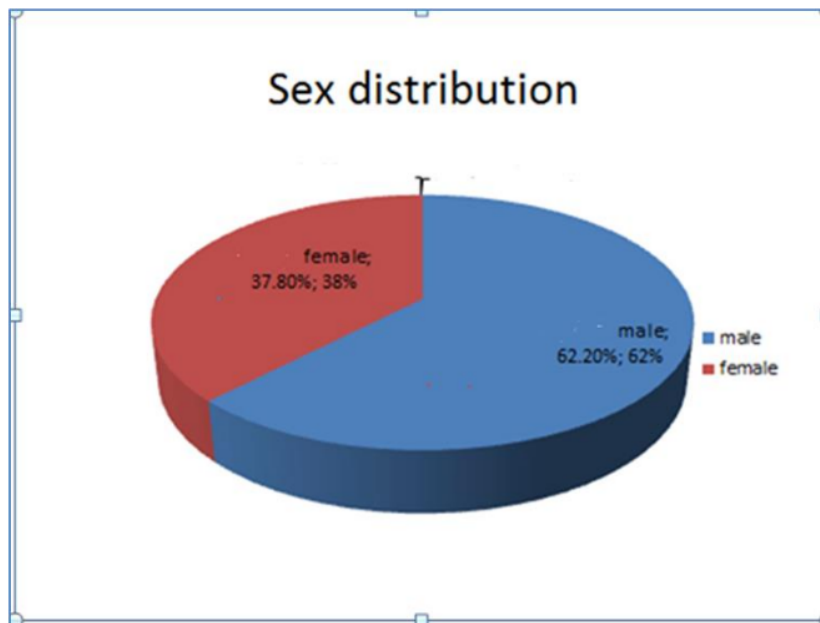


Figure (1) Male to female ratio 1.5:1.

In this study we follow the ¹⁷ Lund and Mackay staging system (symptoms score).the most common presentation was nasal obstruction 62%, facial pain 13%, and nasal discharge 11%, (Table 2).

Table (2) Incidence of chief complaint.

Symptom	No. of cases	%
Facial pain	6	13
Headache	4	9

Nasal obstruction	28	62
Nasal discharge	5	11
Olfactory disturbances	2	4
Total	45	100

Table (3) duration of the chief complaint.

Duration	Group A		Group B	
	NO.	%	NO.	%
< 1 year	5	20	5	25
1-2 years	11	44	9	45
>2	9	36	6	30
Total	25	100	20	100

Most common finding was congested mucosa followed by hypertrophied inferior turbinate as in table (4). In order frequency was mucopus in osteomeatal complex, polyp, large middle turbinate as shown in table (4). Radiological examination by CT-scan was confirmatory for clinical and endoscopic examination for diagnosis of chronic sinusitis, (Table 4).

Table (4) clinical finding on anterior rhinoscopy, radiological finding and endoscopic finding.

Clinical finding	No.	%
Hypertrophied turbinate	35	78
Congested mucosa	40	89
Septal deviation	19	42
Pale mucosa	5	11
Mucopurulent discharge	4	9
Bilateral polyp	4	9
Endoscopic finding	No.	%
Enlarged bulla	2	4.4
Polyp	8	17.7
Mucopus in OMC	20	44.4
Large middle turbinate	5	11.1
Secondary ostia	2	4.4
Sinus system	No.	%
Maxillary	45	100
Anterior ethmoid	21	47
Posterior ethmoid	6	13
Frontal	2	4
Sphenoid	1	2
Osteomeatal unit	30	7

Inferior meatal antrostomy done for all cases and other procedures as shown in table (5).

Table (5) Conventional procedures.

Procedures	No.	%
Inferior meatal antrostomy	25	100
Polypectomy	4	16
Septoplasty	12	48
Turbinoplasty	2	8

Uncinectomy and middle meatal antrostomy was done for all cases and other procedures according to case as shown in table (6)

Table (6) type of endoscopic procedures.

Procedure	No.	%
Uncinectomy	20	100
Middle meatal antrostomy	20	100
Anterior etmoidectomy	4	20
Reduction of middle turbinate	2	10
polypectomy	4	20
turbinoplasty	3	15
septoplasty	4	20

About 4 cases of group (B) suffering from adhesion at early (2-3) weeks post-operative period while only one in group (A) as shown in table (7).

Table (7) Complications.

Complication	Endoscopy		Conventional	
	No.	%	No.	%
Adhesion	4	20	1	4
Bleeding	1	5	3	12
CSF leak	0	0	0	0
Orbital	0	0	0	0

During the post-operative period (1st month) there's no statistical difference in both groups ($p > 0.05$), while after 4-6 month group B better than group A in facial pain and nasal discharge ($p < 0.05$), nasal obstruction and headache statically no difference as shown table (8 and 9).

Table (8) Lund and MacKay score in chronic sinusitis (Facial pain and nasal blockage)

Symptom	Visit	Conventional	Endoscopic	p-value
Facial pain	1 st	3.08±1.4	3±1.5	P>0.05
	2 nd	1.96±1.27	1.45±0.82	P>0.05
	3 rd	1.76±1.03	0.8±0.9	P<0.05
	4 th	1.56±1.3	0.8±0.	P<0.05
	5 th	1.5±1.6	0.5±0.6	P<0.05
Nasal blockage	1 st	2.32±1.3	2.35±1.5	P>0.05
	2 nd	1.52±0.87	1.4±0.9	P>0.05
	3 rd	1.1±0.2	0.9±0.6	P>0.05
	4 th	0.8±0.2	0.65±0.5	P>0.05
	5 th	0.75±0.35	0.6±0.5	P>0.05

Table (9) Lund and MacKay score in chronic sinusitis (Nasal discharge and headache).

Symptom	Visit	Conventional	Endoscopic	P value
Nasal discharge	1 st	1.76±1.23	1.90±1.33	P>0.05
	2 nd	1.64±1.34	1.25±1.06	P>0.05
	3 rd	1.03±0.8	0.9±0.6	P<0.05
	4 th	1.48±0.82	1±0.64	P<0.05
	5 th	1.8±1.6	0.15±0.34	P<0.05
headache	1 st	2.76±1.33	2.74±1.48	P>0.05
	2 nd	1.6±1	1±1.1	P>0.05
	3 rd	1.32±0.7	1.3±0.5	P>0.05
	4 th	1.48±1.19	1.55±0.60	P>0.05
	5 th	1.54±1.4	1.35±0.48	P>0.05

DISCUSSION

The mean age (in years) of our case for conventional surgery was 25±6.9 and for endoscopic surgery was 28.5±10.4 the majority of age group between 21-30 (33.3%) and 31-40 (26.6%) and male to female ratio 1.5:1. Venkatachalam and Jain [5] in his study mean age was (29.1). Ling and Kountakis [6] was found mean age (49.4), male: female (1.1:1) Iseh et al. [7] were found mean age was (31) and male: female (1:1). The study by Fairley 1993 [8] mean age for endoscopic surgery was (52) and inferior meatal antrostomy (45), male: female (1.5:1). Ragab et al. [9] mean age was (43), male: female (1:1). Regarding the results of age, Venkatachalam VP and Iseh KR, et al. studies are agree with our study while Ling FT, Fairley and Ragab et al. are not agree with our study, perhaps due to larger sample and the elderly people constitute larger percentage in western and developed countries.

In our study the most common presentation was nasal obstruction, facial pain, nasal discharge and headache .which agree with: Bhattacharyy and Lee [10] study who found that most common reported symptoms in order severity and presence were: Nasal obstruction, discharge, headache, facial pain, and olfactory disturbances, while Wan et al. [11], report nasal obstruction, nasal discharge, headache, facial pressure and altered sense of smell. In contrast with Ling and Kountakis [6], who record post nasal drip, nasal obstruction and facial congestion, and Chester and Sindwani [12] report nasal discharge, nasal obstruction, facial pain, congestion and anosmia. Soler et al. [13] found nasal congestion, headache, decrease sense of smell, nasal discharge and facial pain.

This study approximately, 100% had no major complications. In addition, for minor complication only 12% had postoperative bleeding for conventional surgery and 20% had adhesion (between the middle turbinate and middle meatus in endoscopic surgery that didn't require revision. These results go with Bera and Rao [14] found out of 100 cases subjected to endoscopic sinus surgery 92% had no major complications. Hartog et al. [15] reported no complication following endoscopic surgery. Fairley, [8] and Ragab et al. [9] reported 17.6% minor complications following inferior meatal antrostomy.

In our study post-operative symptoms score show no difference $p>0.05$ in the post-operative period (1st week-1st month). While after 2nd month endoscopic group show better score $p<0.05$ for nasal discharge and facial pain in contrast nasal obstruction and headache show no significance difference $p>0.05$ between both groups. Fairley, [8] found no difference in the symptoms scores at follow up. Khalil and Nunez [16] shown no significance difference between middle metal antrostomy and inferior meatal antrostomy. Arenes et al. [17], comparison of middle and inferior meatal antrostomy reveal no significance difference although no indication of follow-up time was given. However, when the percentage of symptoms which are the same or worse following the surgery are compared, the functional endoscopic sinus surgery cases do significantly better in all cases. Hartog et al. [15] shown a significant improvement for nasal discharge and hyposomia in the FESS group.

Venkatachalam [5] revealed that FESS had combined advantages of precise, a traumatic, removal of the disease with minimal morbidity and retaining physiological function of nose and paranasal sinuses. Lund, [18] stated that middle meatal antrostomy offer better surgical results. Buiters, [19] when the focus of chronic sinusitis appears to be situated in the infundibulum/anterior ethmoid region, the functional endoscopic surgery seems preferable.

CONCLUSIONS

Chronic rhinosinusitis affect mainly young age groups and more in male cases. Radiological study in form ct-scan is confirmative investigation in the diagnosis of chronic rhinosinusitis. Postoperative symptoms score: A) is equal in both groups in the 1st month of postoperative period and B) Endoscopic surgery is better only in facial pain and discharge post-operative period between 2nd and 6th month. Conventional surgery is effective in treatment of chronic sinusitis especially in presence of predisposing factors as septal deviation while endoscopic surgery effective when theirs osteomeatal unit obstruction.

Disclosure

None

REFERENCES

1. Ashish R. Shah, MD, Frank N. Salamone, MD, & Thomas A. Tami, MD. CURRENT Diagnosis & Treatment 2nd edition p 273
2. ROBERT M. NACLERIO, MD ANIL GUNGOR, MD etiological factor in inflammatory sinus disease. Diseases of sinuses Diagnosis and Management 2001 p47
3. KEY TOPICS IN OTOLARYNGOLOGY and Head and Neck Surgery Second Edition N.J.ROLAND MD, FRCSR. D.R.McRAE FRCS A.W.McCOMBE MD, FRCS p285
4. GLENIS SCADDING Medical management of chronic rhinosinusitis,scott:Brown otolaryngology head and neck surgery 7th edition 2008,p1471
5. Venkatachalam VP, Jain A. Comparative evaluation of functional endoscopic sinus surgery and conventional surgery in the management of chronic sinusitis. Journal of the Indian Medical Association. 2002 ; 1 00 : 78-9, 82-3 .
6. Ling FT, Kountakis SE. Important clinical symptoms in case undergoing functiona endoscopic sinus surgery for chronic rhinosinusitis.Laryngoscope.2007June; 117(6):1090-3.
7. Iseh KR, Makusidi MM, Aliyu D. Surgical management of chronic rhinosinusitis in north western Nigeria and challenges for future.XNiger J Med.2009 Jul-sep;18(3):277-81.
8. Fairley JW. A prospective randomized controlled trial of functional endoscopic sinus surgery: endoscopic middle meatal antrostomyversus conventional inferior meatal antrostomy. (internet results ,unpublished data), 1993.
9. Ragab SM, Lund VJ, Scadding G. Evaluation of the medical and surgical treatment of chronic rhinosinusitis: a prospective, randomised, controlled trial. Laryngoscope 2004; 114:923–30.
10. Bhattacharyya N, Lee LN. Evaluating the diagnosis of chronic rhinosinusitis based on clinical guidelines and endoscopy. otolaryngology Head and neck surgery .2010 Jul;147-51
11. Wan L, ShiN, WangY, Liu Z,Cui Y. Symptomatic characteristics of chronic rhinosinusitis cases and symptom-specific outcomes after endoscopic sinus surgery.Lin Chung Er Bi Yan Hou Tou Jing Wai Ke Za Zhi.2009 sep;(17):781-3.
12. Chester AC, Sindwani R. Symptom outcomes in endoscopic sinus surgery:a systematic review of measurement methods. Laryngoscope.2007 Dec; 117(12):2239-43.
13. Soler ZM, Mace J, Smith TL. Symptom-based presentation of chronic sinusitis and symptom-specific outcomes after endoscopic sinus surgery. Am J Rhinol.2008 May-Jun; 22(3):297-301.
14. Bera SP, Rao L. Nasal endoscopy in chronic /recurring sinusitis.Auris Nasus Larynx .1997 Apr;171-7.

15. Hartog B, Van Benthem PG, Prins LC, Horduk G. Efficacy of sinus irrigation versus sinus irrigation followed by endoscopic sinus surgery. *Annals of Otolaryngology, Rhinology, and Laryngology*. 1997; 106: 759–66.
16. Khalil HS, Nunez DA, Functional endoscopic sinus surgery for chronic rhinosinusitis. *Cochrane Database Syst Rev*. 2006 Jul 19; 3:CD004458.
17. Arnes E, Ankle IM, Mair IW. A comparison between middle and inferior meatal antrostomy in the treatment of chronic maxillary sinus infection. *Rhinology* 1985;23(1):65–9.
18. Lund VJ. The results of inferior and middle meatal antrostomy under endoscopic control, *Acta Otorhinolaryngol Belg*. 1993;47(1):65-71.
19. Buitter CT. Nasal antrostomy. *Rhinology*. 1988 Mar;26(1):5-18.