

A Comparative Study of Partial Uncinectomy Versus Total Uncinectomy in Chronic Rhinosinusitis Cases

Kattula Divya Prasanna¹, Pentapati Chaitanya², Vegiraju Divya Mani³,
Pedapati Dharmendra Manohar⁴

¹Assistant Professor, Department of ENT, Maharaja Institute of medical sciences,
Vijayanagaram, Andhra Pradesh, India.

²Assistant Professor, Department of ENT, Maharaja Institute of medical sciences,
Vijayanagaram, Andhra Pradesh, India.

³Senior Resident, Department of ENT, Maharaja Institute of medical sciences,
Vijayanagaram, Andhra Pradesh, India.

⁴Consultant ENT Surgeon, Department of ENT, Surya Multispecialty Hospital,
Tallarevu, Kakinada, Andhra Pradesh, India

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Corresponding author: Dr. Pentapati Chaitanya

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Abstract

Background: In this study, we wanted to compare operative time and healing time in partial and total uncinectomy. We also wanted to compare between total and partial uncinectomy results in terms of patient symptoms improvement and complications in partial and total uncinectomy.

Methods: This was a hospital based prospective study conducted among 50 patients who presented with chronic rhinosinusitis to the Department of Otorhinolaryngology in Maharaja institute of medical sciences, Vijayanagaram, from January 2022 to December 2022, and underwent partial uncinectomy on right side and total uncinectomy on left side, after obtaining written informed consent from the study participants.

Results: Operative time in partial uncinectomy is 1 - 4 min, and total uncinectomy is 4 - 6 min. Partial uncinectomy has a significantly shorter operative time when compared to total uncinectomy with a p-value < 0.001. Healing time [weeks] ranged from 1 - 3 weeks in partial uncinectomy and 2 - 3 weeks in total uncinectomy, with a significant difference between them with a p-value < 0.001.

Conclusion: Compared to total uncinectomy, partial uncinectomy has a shorter operative and healing time. Total and partial uncinectomies are effective in relieving symptoms with slightly better effectiveness in total uncinectomy. All complications were reported in total uncinectomy. No significant difference between partial and total uncinectomy was noted with regard to any of the studied complications.

Keywords: Partial Uncinectomy, Total Uncinectomy, Chronic Rhinosinusitis.

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Introduction

Rhinosinusitis is a diagnosis made on clinical grounds based on characteristic

symptoms, combined with objective evidence of mucosal inflammation.

Chronic rhino sinusitis (CRS) is a chronic inflammation of nasal mucosa and one or more paranasal sinuses. It is characterized by two or more symptoms, one of which should be either nasal blockage/obstruction/ congestion or nasal discharge (anterior/posterior nasal drip): +/- facial pain/pressure +/- reduction of sense of smell.[1] CRS represents a significant disease burden worldwide, affecting at least 11 % of the population.[2] It significantly impacts the quality of life by interfering with general health, vitality, and social functioning and causes a decrease in workforce productivity, comparable with that observed in patients with coronary heart disease and chronic lung disease.[3] In chronic maxillary sinusitis, sinus mucosa will be inflamed, swollen, and often filled with pus or mucous due to natural and accessory Ostia's blockage. It was commonly treated with medication. Medical treatment for CRS includes topical intranasal steroids, topical antibiotics, nasal saline irrigation, oral antibiotics, oral steroids, or a combination of steroids and oral antibiotics.[4] Medical treatment decreases sinus oedema, helps drainage of the sinuses, and eradicates the infection. Cases not responding to medical therapy need functional endoscopic sinus surgery.[5]

The objective of functional endoscopic sinus surgery (FESS) consists of the following aspects, which may be achieved individually or in combination.[6]

1. Improvement or restoration of disturbed ventilation or drainage,
2. Removal of relevant foci of a disease
3. Preservation of only slightly altered or normal mucosa,
4. The possible protection of anatomical landmarks

When surgical intervention (FESS) is required in cases of chronic rhino sinusitis, diagnostic nasal endoscopy is done in addition to a CT scan of the paranasal sinuses.[7,8] The most common area in the pathogenesis of chronic rhino sinusitis is

the maxillary sinus ostium.[9] The concept of FESS is based on the study of Messerklinger, which describes mucociliary defects and narrowing of osteomeatal complex as the main cause of recurrent chronic rhino sinusitis.[10,11,12]

In functional endoscopic sinus surgery (FESS), the first step is uncinectomy.[13,14] The uncinete process is a thin bone-like leaflet that lies almost free within the middle meatus covering the maxillary sinus opening. It is attached anteriorly with the lacrimal bone and its posterior end with the inferior turbinate and perpendicular plate of the palatine bone. There is a well pneumatized and most constant anterior ethmoidal cell behind the uncinete process, namely ethmoidal bulla. A groove separates these structures, called the hiatus semilunaris, and it is two dimensional. It opens into the ethmoidal infundibulum, which houses the maxillary sinus ostium.[15] Partial excision of the uncinete process improves patients with isolated maxillary sinusitis.[16] Total uncinectomy is not essential because it delays the healing and can cause injury to vital structures such as lamina papyracea or nasolacrimal duct.[17] This study evaluates and compares partial uncinectomy and total uncinectomy in bilateral chronic rhino sinusitis patients.

Aims and Objectives

1. To compare operative time and healing time in partial and total uncinectomy.
2. To compare total and partial uncinectomy results in terms of patient symptoms improvement.
3. To compare complications in partial and total uncinectomy.

Materials & Methods

This was a hospital based prospective study conducted among 50 patients who presented with partial uncinectomy on the right side & total uncinectomy on the left side to the Department of Otorhinolaryngology in Maharaja institute of medical sciences, Vijayanagaram from

January 2022 to December 2022, after obtaining written informed consent from the study participants.

Inclusion Criteria

1. Patients with bilateral maxillary sinusitis.
2. Chronic rhino sinusitis patient's refractory to maximal medical management.
3. Patients of age group above 18 years and below 50 years.
4. Both sexes.

Exclusion Criteria

1. Patients with benign tumours and malignancy of nose and paranasal sinuses

2. Patients with frontal sinusitis, anterior and posterior ethmoid sinusitis, and sphenoid sinusitis.
3. Patients with mucoceles of paranasal sinuses.
4. Pregnancy and lactating mothers.
5. Age group below 18 years and above 50 years.

Statistical Methods

Data was entered in MS-Excel and analysed in Statistical Package for Social Sciences (SPSS V25). Descriptive statistics were represented with percentages, mean with SD. Chi-square test, Fisher's exact test, independent t-test were calculated. P value < 0.05 was considered as statistically significant.

Results

Table 1: Demographic Distribution

Sex	Frequency	%
Male	26	52
Female	24	48
Total	50	100
Sex Distribution		
Age	Frequency	%
20 - 30	22	44
30 - 40	19	38
> 40	9	18
Total	50	100
Age Distribution		

26 patients were males (52 %) and 24 patients were females (48 %) in the study. Overall, the study group was male predominant.

31 years was the mean age of patients. The majority of patients belonged to the younger age group 20 - 30years

Table 2: Operative Time for Partial and Total Uncinectomy

Variable	Group	N	Minimum	Maximum	Mean	SD	P-Value
Operative time in minutes	PU	50	1	4	2.44	0.79	< 0.001
	TU	50	4	6	4.56	0.58	

Operative time in partial uncinectomy is 1 - 4 min, and total uncinectomy is 4 - 6 min. Partial uncinectomy has a significantly

shorter operative time when compared to total uncinectomy with a p-value < 0.001.

Table 3: Healing Time for Partial and Total Uncinectomy

Variable	Group	N	Minimum	Maximum	Mean	SD	P-Value
Healing time in weeks	PU	50	1	3	1.80	0.73	< 0.001
	TU	50	2	3	2.58	0.50	

Healing time [weeks] ranged from 1 - 3 weeks in partial uncinectomy and 2 - 3 weeks in total uncinectomy, with a significant difference between them with a p-value < 0.001.

Discussion

Chronic Rhinosinusitis (CRS)

It is one of the most common diseases in many parts of the world, including India. The prevalence of CRS is on the rise, posing a severe healthcare problem in society. Hence, a proper evaluation of the disease and its treatment modality by testing its effectiveness is very much needed. Despite the global distribution, the prevalence of CRS shows a wide variation based on geographical distribution. According to the GALEN study, CRS's prevalence in European countries and the USA was around 10.9 % and 11.9 %.[18] The incidence of CRS in Europe, according to the Hastan study, was 19.9 %. Blackwell's research showed that CRS incidence in the USA was 11.8 - 12 % and was higher among females. There are no large-scale epidemiological studies in the Asian subcontinent. In a study, Kim *et al.*, CRS's incidence in Korea was around 6.95 %.[19]

In a cross-sectional study from China by Shi *et al.*, the overall prevalence of CRS was 8 %, and that prevalence was higher among males than females.[20] Inflammation of the nose and paranasal sinuses occurs as a result of various factors. Genetic factors such as cystic fibrosis, anatomic abnormalities such as concha bullosa, septal spur, paradoxical turbinate, allergic or immune disorders, trauma, noxious chemicals, infections, post-surgery, medications, etc. are few salient causes.[1] It is estimated that children have six to eight URI per year, and adults average two to three.[21] Suppose an assumption is made that 90 percent of patients with colds have sinusitis (bacterial and viral). In that case, it can be estimated that there are over a billion cases of viral

and bacterial rhinosinusitis in the USA annually.[22]

Age Distribution

Chronic rhino sinusitis involves all age groups. In Europe, the prevalence of CRS decreases in the age group of > 55 -year-old patients. There were no differences found in the age groups of the less than 35 year - old and 35 – 54 year old patients. In North America, the prevalence rate increases from 2 % to 7 % between 18 and 70 years. In the present study, the population ranged from 15 to 50 years. The average age of the patient was 31 years. The majority of patients belonged to the age group 20 years (30 %), of which 6 were males and 3 were females. In a study by Hemant Chopra *et al.*, the patients presenting were in the range of 5 - 65 years, and the mean age of presentation is 35 years.[23]

In a study by Ashoor Abdul Aziz *et al.*, FESS was done in age ranged between 5 - 72 years (mean 34.2 years).[24] Thulasidas, Vaidyanathan study documented the mean age of 43.8 years.[25] In a study done by Cho and Hwang, the mean age of presentation was slightly higher at 48 years.[26] Hence, the present study was comparable to the research done by Aziz *et al.* and Hemanth Chopra *et al.* It was contradictory to the study done by Tulasidas and Cho and Hwang.

Sex Distribution

The incidence of CRS regarding sex distribution shows the variation in worldwide distribution. Among 50 patients, 24 patients were males (52 %), and 24 patients were females (48 %). In the present study, male preponderance was seen, with a male to female ratio of 1.08 : 1. The study is in accordance with the above studies with slight male preponderance.

Presenting Symptoms

In the present study, the most common symptom was post-nasal drip affecting 93.3 % of patients followed by headache (80 %), anterior nasal discharge (64 %), nasal

obstruction (54 %), hyposmia (40 %), halitosis (20 %), ear pain (13.3 %). No patients had fever as their complaint.

In Wael Fawzy Ismaiel Essa's study, presenting symptoms were in the form of post-nasal discharge in 85.0 % of cases; headache in 68.3 % of cases; anterior nasal discharge in 30.0 % of patients, and nasal obstruction in 25.0 % of cases.

In Sayed Mekhiemer *et al.* study, presenting symptoms were in the form of post-nasal discharge in 82.5 % of patients; headache in 65 % of patients; nasal obstruction in 27.5 % of cases anterior nasal discharge in 27.5 % of patients.

In Jacob *et al.* study, headache is the most common presenting symptom. In the present study, post-nasal discharge is the most common presenting symptom. Post-operatively post-nasal discharge is difficult to assess in patients undergoing partial uncinectomy on the right side and total uncinectomy on the left side.

Hence in the present study, headache, anterior nasal discharge, nasal obstruction are compared. In Wael Fawzy Ismaiel Essa's study, operative time [uncinectomy] ranged from 3 - 6 minutes with a mean of 4.31 ± 1.02 minutes.

There was a statistically significant shortening of operative time in the partial uncinectomy group when compared to the total uncinectomy group [3.46 ± 0.51 vs. 5.17 ± 0.59 minutes, respectively].

In Sayed Mekhiemer's study, operative time ranged from 1 - 3 minutes in the partial uncinectomy group and 4 - 5 minutes in the total uncinectomy group.

There was a statistically significant shortening of operative time in the partial uncinectomy group compared to the total uncinectomy group.

In Byun and Lee's study, it ranges from 1.95 to 3.17 minutes in partial and 2.37 to 4.51 minutes in total uncinectomy. The

present study is in accordance with the above studies.

In Sayed Mekhiemer's study, healing time [weeks] was ranged from 1 - 3 weeks in partial uncinectomy and 2 - 3 weeks in total uncinectomy, with a significant difference.

In Wael Fawzy Ismaiel Essa, healing time [weeks] was ranged from 1 - 3 weeks, with no significant difference between partial uncinectomy and total uncinectomy [1.97 ± 0.56 vs. 2.13 ± 0.34 weeks, respectively].

Byun and Lee study reported healing period ranges from 1.18 - 2.36 weeks in partial uncinectomy and 1.63 - 3.21 weeks in total uncinectomy.

In present study, healing time after partial uncinectomy is less when compared to total uncinectomy showing significant difference statistically.

In the present study, the headache is relieved equally after partial and total uncinectomy. Sayed Mekhiemer *et al.* and Wael Fawzy Ismaiel Essa's study showed improvement of headache after partial and total uncinectomy and is statistically non-significant; however, clinically, total uncinectomy is more effective in relieving headache.

When comparing partial and total uncinectomy regarding effectiveness in anterior nasal discharge, Sayed Mekhiemer *et al.* and Wael Fawzy Ismaiel Essa's studies showed both are effective nearly to the same extent, as the difference was statistically non-significant. However, total uncinectomy showed better effectiveness as regards anterior nasal discharge.

The present study showed improvement in anterior nasal discharge 92 % post-operatively. The results of the present study are comparable to the above studies.

In the present study, there is an improvement in nasal obstruction (96 %) after total uncinectomy. The study is in accordance with the study of Sayed Mekhiemer *et al.* and Byun and Lee study

and contradiction to Kamel and Wael Fawzy Ismaiel Essa's study.

Out of 50 partial and 50 total uncinectomies, one patient had nasolacrimal duct injury, 2 patients had an injury to lamina papyracea, and synechia formation is seen in 3 patients in total uncinectomy. Statistically, no significant difference between partial and total uncinectomy is noted; However, clinically, complications are seen more in total uncinectomy. Nasolacrimal duct injury is observed in one case in total uncinectomy.

In above studies, no injury to nasolacrimal duct is reported in partial uncinectomy. The present study is in accordance with the above studies.

No statistical significance is noted about nasolacrimal duct injury in partial and total uncinectomy.

Friedman *et al.*[27] reported nasolacrimal duct obstruction is theoretically possible, but it is also an uncommon side effect.

Injury to lamina papyracea is noted in total uncinectomy; however, no statistical significance was noted about lamina papyracea injury in partial and total uncinectomy.

Kamel[28] reported one case of lamina papyracea injury out of 94 total uncinectomy operation cases.

This agrees with results in Byun and Lee study which reported occurrence of lamina papyracea injury in one case of total uncinectomy group. The present study is in accordance with the above studies. After total uncinectomy, 4 % of patients presented with synechia formation after 1 month and 2 % after 3 months after total uncinectomy.

No synechia formation is observed after partial uncinectomy. However, there is no statistical significance between partial and total uncinectomy.

The present study showed 2 patients had synechia formation 1 month after total

uncinectomy, and 1 patient had synechia formation 3 months after 50 total uncinectomies.

Sayed Mekhiemer *et al.* study showed partial synechia in 3 patients after 20 total uncinectomies. Wael Fawzy Ismaiel Essa conducted 30 total uncinectomies, out of which, 3 patients had synechia formation post-operatively.

In Kamel study, there were three cases of post-operative synechia out of 94 total uncinectomy operation cases.

Conclusion

Compared to total uncinectomy, partial uncinectomy has a shorter operative and healing time. Total and partial uncinectomies are effective in relieving symptoms with slightly better effectiveness in total uncinectomy. All complications were reported in total uncinectomy. No significant difference between partial and total uncinectomy was noted with regard to any of the studied complications.

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