

Original Article

Total versus partial uncinectomy in functional endoscopic sinus surgery

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ABSTRACT

Background: Chronic rhinosinusitis is a clinical syndrome defined by persistent symptomatic inflammation of the mucosa of the nasal cavities and paranasal sinuses. Usually, it responds to conservative medical treatment. Cases that resist medical treatment usually need functional endoscopic sinus surgery. Uncinectomy is the first step in functional endoscopic sinus surgery.

Objective: to compare between partial and total uncinectomy results in terms of patient symptoms improvement, operative data (operative time and complications), and postoperative complications in management of localized maxillary sinusitis.

Methodology: the present study included 40 cases with chronic maxillary sinusitis allocated for functional endoscopic sinus surgery after failure of medical treatment. The 40 cases were divided into groups (20 cases each). Partial uncinectomy was done in group A and total uncinectomy was done in group B.

Results: both partial and total uncinectomy were compared in terms of safety and effectiveness. Total uncinectomy had significantly longer operative time and had more complications when compared to partial uncinectomy. In addition, total uncinectomy was more effective in relieving headache, anterior nasal discharge and nasal obstruction, while partial uncinectomy was more effective in relieving postnasal discharge. None of these results reached a statistically significant value.

Conclusion: compared to total uncinectomy operative time, healing time and complications were less in partial uncinectomy. Despite that both are effective in resolving the symptoms, partial uncinectomy is preferred in patients with localized maxillary sinusitis.

JRAM 2020; 1 (2): 75-79

Keywords: Total uncinectomy, partial uncinectomy, localized maxillary sinusitis, functional endoscopic sinus surgery.

Submission date: 22 November 2019

Acceptance date: 25 December 2019

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Please cite this article as: Mekhiemer SM, Kadah SMA, Abd-Elgaber FM, Abd-Elghaffar A. Total versus partial uncinectomy in functional endoscopic sinus surgery. *JRAM 2020; 1 (2): 75-79*. DOI: 10.21608/jram.2019.19956.1022

INTRODUCTION

When the nose and its surrounding nasal sinuses become inflamed for at least twelve weeks, despite of taking medical treatment, the chronic rhinosinusitis (CRS) is considered^[1,2]. Medical treatment options for CRS include topical intranasal steroid, oral antibiotics, topical antibiotics, nasal saline irrigation, oral steroids or combination of oral antibiotics and steroids^[3]. Medical treatment aims to decrease sinus edema, help drainage of the sinuses and help in eradication of the infection. Cases not responding to medical treatment need functional endoscopic sinus surgery^[4]. When surgical intervention (Functional endoscopic sinus surgery) is required in cases of chronic rhinosinusitis, diagnostic nasal endoscopy is done in addition to CT scan of the nasal sinuses^[1,2]. The concept of functional

endoscopic sinus surgery is based on the publication of Messerklinger in which mucociliary defects and narrowing of osteomeatal complex are considered as the main cause of recurrent chronic rhinosinusitis^[5, 6, 7]. Functional endoscopic sinus surgery [FESS] helps to clean and ventilate the natural ostia. The most common area in pathogenesis of chronic and recurrent rhinosinusitis is maxillary sinus ostium^[8]. Functional endoscopic sinus surgery [FESS] consists of many steps the first step is uncinectomy^[9, 10]. The uncinuate process is a thin bone like leaflet that can be attached to the lateral nasal wall, the lamina papyracea, the anterior cranial fossa, on the ethmoidal roof, or the middle concha^[11,12]. The space between the upper part of the uncinuate process and ethmoidal bulla is the

hiatus semilunaris which opens into ethmoidal infundulum which houses the maxillary sinus ostium^[13]. The most important step in FESS is uncinectomy^[14]. Partial excision of uncinete process helps to improve patients with pathological conditions localized to the maxillary sinus^[15]. Total excision of uncinectomy is not essential because it delays the healing, can cause injury to important structures as lamina papyracea or nasolacrimal duct^[16]. There are documented complications of the endoscopic sinus surgery such as lamina papyracea injury (because it is very thin and, in some patients, may be touching the uncinete process). This leads to injury of the orbital cavity which may lead to blindness^[17]. This work evaluates the outcome of partial uncinectomy in comparison to total uncinectomy as regard curative rate, operative data, operative complications and postoperative complications.

SUBJECTS AND METHODS

This study included 40 cases that showed symptoms and signs suggestive of chronic sinusitis and they failed to respond to medical treatment. The age ranged from 19 years to 51 years; 24 of them were males and 16 were females. Uncinectomy was done as a part of FESS surgery. Cases were selected from Al-Zahraa Hospital, from March 2015 to December 2017. The study protocol was approved by local ethical committee of the Otorhinolaryngology department. Consents of the patients were obtained. The 40 cases were divided randomly into two groups (20 cases each).

Group A were electively assigned to partial uncinectomy and **group B** were electively assigned to total uncinectomy.

Preoperative assessment was done including personal history, history of present illness, rhinorrhoea (mucopurulent, purulent or watery), Nasal obstruction (partial or total, permanent or alternating), sneezing, smell disorders, postnasal discharge, headache. Past medical and surgical histories were conducted. General examination, nose examination including anterior rhinoscopy and Nasal endoscopic examination were done. Investigations were done in the form of fasting blood sugar, complete blood picture, liver and kidney function. Preoperative CT scan (nose and paranasal sinuses). **Inclusion criteria:** Cases with chronic sinusitis that failed to respond to medical treatment. **Exclusion criteria:** patients with any contraindication for nasal operation, with previous endoscopic sinus surgery, with nasal polyposis, suffering from either benign or malignant nasal masses and/or with fungal sinusitis were excluded.

Surgical technique

Anaesthesia: under general anaesthesia and hypotensive blood pressure done by anaesthetologist.

Position: patients lay in a semi-sitting position.

Group A, with partial uncinectomy in which half of the uncinete was removed using Sickel knife and Backbiter to identify the maxillary sinus ostium^[15].

Group B, with total uncinectomy; same surgical technique of group A was applied, in addition removal of the entire uncinete process was done^[15].

Postoperative care: Medical treatment was given to the patients. Nasal packing was removed 2 days after the operation.

Postoperative follow up: We followed the patients on the third day, after one week, weekly for one month and monthly for six months^[18]. Clearing the nasal cavity and removing any blood clot or crustation were done in the visits.

The following parameters were evaluated: operation time, healing time and incidence of postoperative complications.

Statistical analysis

We analysed our data by using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage. When comparing between two means independent-samples t-test of significance was used. The confidence interval was set to 95% and the margin of error accepted was set to 5%. P-value <0.05 was considered significant.

RESULTS

Our study was designed to evaluate if partial uncinectomy is effective as much as total uncinectomy in management of patients with isolated chronic maxillary sinusitis.

Age ranged from 19 to 51 years; males represented 60% of all studied cases and females represented 40% with male to female ratio of 1.5:1. Presenting symptoms were in the form of post-nasal discharge in 82.5% of cases; headache in 65% of cases; anterior nasal discharge in 27.5% of cases and nasal obstruction in 27.5% of cases. There was no statistically significant difference between group A and group B as regard to age, sex.

Operative time ranged from 1-3 minutes in group A and 4-5 minutes in group B and there was statistically significant shortening of operative time in partial uncinectomy group when compared to total uncinectomy group. [Table 1] Healing time [weeks] was ranged from 1- 3 weeks in group A and 2-3 weeks in group B, with significant difference between groups A and group B. [Table 1]. There were no complications in group A, but in group B complications were in the form of synchia formation 3 cases [15%], Lamina papyracea injury in 1 case [5%] and NLD injury in 1 case [5%] [Figure 1]. As regard postoperative symptoms; postnasal discharge was reported in 9 cases [22.5%] of cases, headache in 3 cases [7.5%], anterior nasal discharge in 6 cases [15%] and nasal obstruction in 4 cases [10%]. In terms of effectiveness in relieving symptoms, the two groups were effective nearly the same. However, group B had better effectiveness in terms of relieving headache, while group A had better effect on postnasal discharge.

Table (1): Comparison between groups according to operation duration and healing period

Variable	Group A (PU) (N=20)	Group B (TU) (N=20)	t-test	p-value
Operation duration (min)				
Mean ±SD	2.04±0.58	4.59±1.31	7.960	<0.001*
Range	1- 3	4-5		
Healing period (week)				
Mean ±SD	2.30±0.66	2.81±0.80	2.199	0.034*
Range	1-3	2-3		

*Significant p-value < 0.05

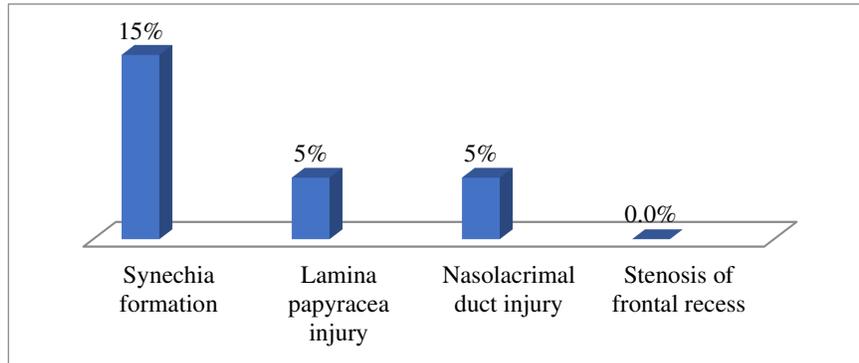


Figure (1): Post-operative complications among group B assigned to total uncinectomy

DISCUSSION

When the medical treatment fails in cases of chronic rhinosinusitis surgical intervention is needed in the form of functional endoscopic sinus surgery [19]. Functional endoscopic sinus surgery [FESS] was done when medical treatment failed. Partial uncinectomy provides the same result as total uncinectomy without complications of total uncinectomy [9]. However, partial uncinectomy had significantly shorter operative time. Total uncinectomy had higher complications when compared to partial uncinectomy. As regard relieving of the symptoms total uncinectomy was more effective in relieving headache but partial uncinectomy was more effective in relieving postnasal discharge. On the other hand, anterior nasal discharge and nasal obstruction are of equal results in both groups.

Regarding age it was ranging from 20 – 51 in (Partial uncinectomy) and 19 – 46 in Group B (Total uncinectomy); by **Byun and Lee** [15] age was ranging from 11 – 65 in (Partial uncinectomy) and 10 – 59 in Group B (Total uncinectomy); while by **Kamel** [18] the ages were between 13 and 61 years.

Regarding gender 24 of them were males and 16 were females distributed males represented 60% of all studied cases and females represented 40% with male to female ratio of 1.5:1. Also, **Byun and Lee** [15] reported 15 of their patients were males and 10 were females distributed males represented 60% of all studied cases and females represented 40% with male to female ratio of 1.5:1. Meanwhile, **Kamel** [18] reported there were 34 males (51.5 %) and 32 females (48.5%) with male: female ratio of 1.06:1.

Regarding to surgical indication of uncinectomy, it was reported that partial uncinectomy is more useful in cases of localized maxillary sinusitis [15, 20]. These data agree to our surgical indications in the present study. Regarding number of cases with chronic sinusitis the number was 40 cases, 20 cases were PU and 20 cases were TU. Regarding to operation duration (min). In our study it ranges from 1- 3 minutes in group A (PU) and 4-5 minutes in group B (TU). While by **Byun and Lee** [15] it ranges from 1.95 - 3.17 minutes in group A (PU) and 2.37 – 4.51 minutes in group B (TU). Regarding to healing period (week). In our study it ranges from 1- 3 weeks in group A (PU) and 2-3 weeks in group B (TU). Also, **Byun and Lee** [15] reported healing period ranges from 1.18 - 2.36 weeks in group A (PU) and 1.63 – 3.21 weeks in group B (TU). This agrees with the results reported by **Byun and Lee** [15] who reported that, operation and healing time of partial uncinectomy were statistically significantly shorter than total uncinectomy. Regarding post-operative improvement in our study postnasal discharge was improved in (77.5%), headache was improved in [92.5%] of cases, anterior nasal discharge was improved in [85%] and nasal obstruction was improved in [90%]. By **Kamel** [18] study postnasal discharge was improved in (89%), headache was improved in [96%] of cases, anterior nasal discharge was improved in [90%] and nasal obstruction was improved in [65%]. Regarding to operative and post-operative complications it was as follow; In our study complications were in group B in the form of Lamina papyracea injury in 1 case [5%], NLD injury in 1 case [5%], synechia formation 3 cases [15%] and there was no significant difference between the two groups as regarding complications. This agrees with results reported by **Byun and Lee** [15]

who reported occurrence of lamina papyracea injury in one case of total uncinectomy group. Partial synechia formations were reported in two cases in group B. In our study 3 cases (15% from 20 patients) reported partial synechia formations. **Friedman et al.** ^[21] reported uncommon side effect as nasolacrimal duct obstruction or stenosis of the frontal recess. This agrees with results reported by **Kamel** ^[18] who reported one case of lamina papyracea injury and three cases of post-operative synechia out of 94 total uncinectomy operation cases.

CONCLUSION

In this study it was found that partial uncinectomy has shorter operative and healing time and less possibility of complications with comparison to total uncinectomy. Complete and partial uncinectomy are effective in relieving symptoms with slight better effectiveness in complete uncinectomy. We recommend that in case of maxillary sinusitis unilateral or bilateral with normal other sinuses to perform partial uncinectomy because it has the same effect of total uncinectomy but less complication.

Financial support

No financial support

Conflict of interest

The authors declared that there is no conflict of interest to be declared.

REFERENCES

- Lam K, Schleimer R, Kern RC.** The etiology and pathogenesis of chronic rhinosinusitis: a review of current hypotheses. *Current allergy and asthma reports.* 2015 Jul 1; 15(7):41.
- Bachert C, Holtappels G.** Pathophysiology of chronic rhinosinusitis, pharmaceutical therapy options. *GMS current topics in otorhinolaryngology, head and neck surgery.* 2015; 14.
- Bose S, Grammer LC, Peters AT.** Infectious chronic rhinosinusitis. *The Journal of Allergy and Clinical Immunology: In Practice.* 2016 Jul 1; 4(4):584-9.
- Young LC, Stow NW, Zhou L, Douglas RG.** Efficacy of medical therapy in treatment of chronic rhinosinusitis. *Allergy & Rhinology.* 2012 Jan; 3(1):ar-2012.
- Messerklinger W.** Role of the lateral nasal wall in the pathogenesis, diagnosis and therapy of recurrent and chronic rhinosinusitis. *Laryngologie, Rhinologie, Otologie.* 1987 Jun; 66(6):293-9.
- Messerklinger W.** Background and evolution of endoscopic sinus surgery: Endoscopic sinus surgery. I. *Ear, nose & throat journal.* 1994; 73(7):449-50.
- Govindaraj S, Adappa ND, Kennedy DW.** Endoscopic sinus surgery: evolution and technical innovations. *The Journal of Laryngology & Otology.* 2010 Mar; 124(3):242-50.
- Catalano PJ.** Minimally invasive sinus technique: What is it? Should we consider it?. *Current opinion in otolaryngology & head and neck surgery.* 2004 Feb 1; 12(1):34-7.
- Senior BA, Kennedy DW, Tanabodee J, Kroger H, Hassab M, Lanza D.** Long-term results of functional endoscopic sinus surgery. *The Laryngoscope.* 1998 Feb; 108(2):151-7.
- Moses RL, Cornetta A, Atkins Jr JP, Roth M, Rosen MR, Keane WM.** Revision endoscopic sinus surgery: the Thomas Jefferson University experience. *Ear, nose & throat journal.* 1998 Mar; 77(3):190-202.
- Lin X, Lin C, Zhang R, Wu X.** Uncinectomy through the anterior nasal fontanelle in endoscopic sinus surgery. *Journal of Craniofacial Surgery.* 2011 Nov 1; 22(6):2220-3.
- Tuli IP, Sengupta S, Munjal S, Kesari SP, Chakraborty S.** Anatomical variations of uncinete process observed in chronic sinusitis. *Indian Journal of Otolaryngology and Head & Neck Surgery.* 2013 Apr 1; 65(2):157-61.
- Wakey M, Takeno S, Hawke M.** The uncinete process: a histological and morphological study. *The Laryngoscope.* 1994 Mar; 104(3):364-9.
- Kim HJ, Ahn JC, Hong SN, Lee WH, Kim JW.** Posterior fontanelle approach for uncinectomy and middle meatal antrostomy in endoscopic sinus surgery. *The Laryngoscope.* 2016 Jun; 126(6):1311-4.
- Byun JY, Lee JY.** Usefulness of partial uncinectomy in patients with localized maxillary sinus pathology. *American journal of otolaryngology.* 2014 Sep 1; 35(5):594-7.
- Cohen NA, Antunes MB, Morgenstern KE.** Prevention and management of lacrimal duct injury. *Otolaryngologic Clinics of North America.* 2010 Aug 1; 43(4):781-8.
- Hopkins C, Slack R, Lund V, Brown P, Copley L, Browne J.** Long-term outcomes from the English national comparative audit of surgery for nasal polyposis and chronic rhinosinusitis. *The Laryngoscope.* 2009 Dec; 119(12):2459-65.
- Kamel RH.** Endoscopic transnasal surgery in chronic maxillary sinusitis. *The Journal of Laryngology and Otology.* 1989; 103: 492-501.
- Piromchai P, Kasemsiri P, Laohasiriwong S, Thanaviratnanich S.** Chronic rhinosinusitis and emerging treatment options. *International journal of general medicine.* 2013; 6:453.
- Kaplan BA, Kountakis SE.** Diagnosis and pathology of unilateral maxillary sinus opacification with or without evidence of contralateral disease. *The Laryngoscope.* 2004 Jun; 114(6):981-5.
- Friedman M, Landsberg R, Schults RA, Tanyeri H, Caldarelli DD.** Frontal sinus surgery: endoscopic technique and preliminary results. *American journal of rhinology.* 2000 Nov; 14(6):393-404.

الملخص العربي

الإستئصال الكلي مقابل الجزئي للنتوء الهلالي في جراحة المناظير الوظيفية للجيوب الأنفية

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ملخص البحث:

الخلفية: التهاب الجيوب الأنفية المزمن عرض يعرف بوجود اعراض ثابتة لالتهاب الغشاء المخاطي للأنف و الجيوب الأنفية. وعادة هي تستجيب للعلاج الدوائي و لكن الحالات التي لا تستجيب للعلاج الدوائي عادة تخضع لعملية جراحية بالمنظار الانفي. واول خطوة في هذه العملية هي □تئصال النتوء الهلالي.

الهدف: من هذه الدراسة هو المقارنة بين نتائج □تئصال الكلي مقابل الجزئي للنتوء الهلالي و دور كل منهم في مدى تحسين الاعراض المرضية و في نفس الوقت تجنب مضاعفات ما بعد العملية.

الطرق: و قد اشتملت الدراسة على ٤٠ حالة ممن يعانون من اعراض التهاب الجيوب الأنفية المزمن و جميعهم لم يستجيبوا للعلاج الدوائي و تم اعدادهم للتدخل الجراحي. و تم تقسيم المرضى لمجموعتين كل مجموعة بها ٢٠ حالة. المجموعة الاولى اشتملت على حالات الازالة الجزئية للنتوء الهلالي و المجموعة الثانية اشتملت على حالات الازالة الكلية للنتوء الهلالي.

النتائج: و قد □فرت نتائج الدراسة عن كفاءة الازالة الجزئية للنتوء الهلالي بالنسبة للامان و الفاعلية مقارنة بالازالة الكلية للنتوء الهلالي بينما كانت الازالة الجزئية تتم في وقت اقل من الازالة الكلية و لها مضاعفات اقل مقارنة بالازالة الكلية و لكن الفروق لم تكن ذات دلالة احصائية. وكذلك كانت الازالة الجزئية اكثر في كفاءة في تخفيف اعراض الرشح الخلفي للأنف بينما كانت الازالة الكلية اكثر كفاءة في تخفيف الصداع الناتج عن التهاب الجيوب الأنفية المزمن و الرشح الامامي و انغلاق الأنف و كانت الفروق ليست ذات دلالة احصائية.

الاستنتاجات: و خلصت نتائج الدراسة عن فعالية و امان الازالة الجزئية للنتوء الهلالي مقارنة بالازالة الكلية للنتوء الهلالي.

الكلمات المفتاحية: □تئصال الكلي للنتوء الهلالي - □تئصال الجزئي للنتوء الهلالي - التهاب الجيوب الأنفية الفكي الموضعي - جراحة المناظير الوظيفية للجيوب الأنفية.

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