

Endoscopic Sinus Surgery for Sinonasal Polyposis: A Comparative Study Microdebrider Assisted Fess V/S Conventional Fess

Priyanka Verma¹, Aditya Gargava², Meenakshi Garg³, Ashish Upadhyay⁴

¹Assistant Professor, Department of Otorhinolaryngology, Atal Bihari Vajpayee Govt. Medical College, Vidisha, MP

²Associate Professor, Department of Otorhinolaryngology, Atal Bihari Vajpayee Govt. Medical College, Vidisha, MP

³M.S. ENT, Department of Otorhinolaryngology, Gajra Raja Medical College, Gwalior

⁴Statistician, Department of Community Medicine, Atal Bihari Vajpayee Govt. Medical College, Vidisha, MP

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Corresponding author: Dr Aditya Gargava

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Abstract:

Objective: To study & compare the benefits of microdebrider- assisted FESS VS conventional FESS in terms of subjective as well as objective improvement in symptoms of nasal polyposis.

Material & Methods: This study involves total 150 patients with bilateral nasal polyp scheduled to undergo FESS. The patients were randomized into two groups: Group A- Conventional FESS and Group B- Microdebrider-assisted FESS.

Results: In our Study male found to be predominant with age distribution of the patients ranged from 13 to 50 years.

Conclusion: we can achieve good postoperative results in both groups provided a well skilled & trained surgeon with proper anatomical knowledge, good instruments, hypotensive anaesthesia, minimal mucosal trauma & regular follow up.

Keywords: DNE (Diagnostic nasal endoscopy), Functional sinus endoscopic surgery (FESS), Computed Tomography (CT- scan)

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Introduction

Nasal polyposis is regarded as one form of chronic inflammation in the nose & sinuses, as a part of spectrum of chronic rhinosinusitis. The prevalence rate of nasal polyposis is about 2%, it increases with age reaching a peak in more age 50 years & older. [1] Nasal polyposis has been associated with different systemic & respiratory diseases such as cystic fibrosis, rhinitis & asthma with or without aspirin sensitivity. [2] Endoscopic sinus surgery is the treatment of choice for patient not responding to medical treatment. [3] Treatment option available for endoscopic polypectomy, microdebrider assisted endoscopic sinus surgery. In conventional method the normal mucosa is also damaged causes increased in bleeding, decrease visibility, suction get clogged repeatedly. Microdebrider have suction at the surgical site, so they have advantages of removing polyp without the need to remove the instruments, continuous suctioning of blood from field improved visualisation & precision during surgery. [4] This is the prospective randomised controlled study to compare debrider assisted functional endoscopic

sinus surgery (FESS) & conventional instruments in treatment of nasal polyposis. Study aims at emphasising the utility of microdebrider to young learning FESS surgeons.

Materials & Methods

This is the prospective randomised controlled study on total 150 patients. Patients with nasal polyp attending ENT OPD of Atal bihari Vajpayee Govt Medical College Vidisha from January 2022 to December 2022. Total 150 patients aged between 13 to 50 years of both genders diagnosed with nasal polyp not responding to medical treatment & requiring endoscopic sinus surgery. Written informed consent was obtained from patients.

Inclusion criteria

1. All cases of nasal polyp age between 13 to 50 years of both genders.
2. Modified Lund-Makay score was used for assessing patient symptoms using Visual analogue scale (VAS) & total score of > 20 was selected.

3. CT-SCAN showing Lund-Mackay total score >8
4. All cases of raised eosinophil count.

Exclusive criteria

1. Patients with active infections, bleeding disorder.
2. Chronic granulomatous diseases of nose & tumours of the nose.
3. Recurrent nasal polyp.
4. History of previous surgery.
5. Patients with contraindications to general anaesthesia.

All patients underwent medical treatment, involving a brief course of systemic steroids for two weeks duration and a topical nasal spray for a month. All patients were admitted & then basic preoperative investigations include blood investigations, absolute eosinophil count, plain X-ray of the nose & PNS (Water’s view), Diagnostic nasal endoscopy (DNE) and plain CT scan of the nose and paranasal sinuses.

Total 150 patients were randomised into two groups of 75 patients each. Group A- Conventional endoscopic sinus surgery & Group B- Microdebrider assisted endoscopic sinus surgery. Both group patients were operated under general anaesthesia after get anaesthetic clearance for

surgery. All patients completed a preoperative visual analogue scale (VAS) & Modified Lund-Mackay scoring to assess the severity of the symptoms. The finding of DNE was scored based on the modified Lund Mackay scoring system. Lund-Mackay scoring for radiological grading was used to grade the disease on the CT scans.

In our study we study the parameters like intraoperative blood loss & operative duration, post operatively scarring, synechiae & polyp recurrence percentages. Patient follow- up was done up to the sixth month postoperatively to inspect crusting, scarring, recurrence of the polyp, synechiae formation. Preoperatively as well as postoperatively subjectively evaluation of patient was done using VAS scoring.

The statistical analysis was done using SPSS version 19.0 software with regression module installed. A statistical comparison between two groups was performed using Chi-square analysis for categorical variables & Student’s t-test for continuous variables. All tests were two-tailed and the significance level was set at p<0.05.

Results

In our Study male found to be predominant with age distribution of the patients ranged from 13 to 50 years.

Table 1: Showing Intraoperative assessment between group A & group B

S.no	Parameters assessed	Group A Conventional(C)	Group B Micro debrider (M)	Standard deviation	p value
01	Intra-operatively blood loss	250 ml	218 ml	15.826	<0.001
02	Duration of surgery	75 min	60 min	8.24	<0.001

Table 2: Showing percentage of postoperative complications among group A & Group B

S. No	Postoperative complications	Group A Conventional FESS	Group B Microdebrider FESS
01	Postoperative scarring	45%	15%
02	Postoperative synechiae	28%	10%
03	Postoperative edema	30%	15%
04	Postoperative recurrence of nasal polyp	48%	16%

Table 3: Preoperative Visual analogue score (VAS) out of 10

S.no	Symptoms	Maximum score	Minimum score	Mean	Standard deviation
01	Facial pain	09	04	7.16	1.324
02	Headache	08	06	8.15	0.892
03	Nasal discharge	10	06	8.42	0.754
04	Nasal obstruction	10	05	6.67	0.894
05	Olfactory disturbance	03	02	2.54	0.768
06	Total points	40	23	32.9	4.632

Total preoperative Minimum Score was 23 & Maximum score was 40

Table 4: Third month postoperative Visual analogue score

S.NO	Symptoms	Maximum		Minimum		Mean		Standard deviation	
		(C)	(M)	(C)	(M)	(C)	(M)	C	M
01	Facial pain	03	02	01	0	1.65	1.04	0.569	0.889
02	Headache	04	03	01	0	2.08	1.07	0.833	0.954
03	Nasal blockage	05	03	01	0	2.78	0.814	0.970	0.812

04	Nasal discharge	05	02	02	0	2.69	1.02	0.802	1.046
05	Olfactory disturbance	05	03	03	02	3.12	1.47	0.707	1.193
06	Total Points	21	13	08	02	12.32	5.414	3.881	4.894

Table 5: Sixth month postoperatively Visual analogue score

S.no	Symptoms	Maximum		Minimum		Mean		Standard deviation	
		(C)	(M)	(C)	(M)	(C)	(M)	C	M
01	Facial pain	2	2	01	0	1.32	0.32	0.476	0.557
02	Headache	3	2	01	0	1.76	0.64	0.597	0.810
03	Nasal blockage	3	2	01	0	1.60	0.68	0.816	0.748
04	Nasal discharge	3	2	0	0	2.08	1.00	0.640	0.645
05	Olfactory disturbance	3	3	01	0	2.32	1.32	0.627	0.945
06	Total points	14	11	4	0	9.04	3.96	1.399	1.881

The total score was 3.96 with microdebrider & 9.04 with conventional FESS.

Table 6: CT- scan finding according to Mackay- Lund staging

S.no	Name of sinuses	Grade 0	Grade 1	Grade 2	Total
01	Maxillary sinus	0	47	103	150
02	Anterior ethmoid	10	34	106	150
03	Posterior ethmoid	15	28	107	150
04	Sphenoid	18	34	98	150
05	Frontal	5	57	88	150

Majority of patient with maxillary sinus involvement had grade 2 (68.67%)



Figure 1: Showing Microdebrider machine with Handle-blade



Figure 2: Showing preoperative DNE & Inoperative use of microdebrider blade

Discussion

Age and gender distribution: In our study maximum number of patient are in age group 18-40 years (42.25%) with male predominance seen.

Study done by Larsen et al [5] (2.9), Drake et al [6], Bettiga et al [7], Ghera et al [8] (male: female – 2.75), Bakari et al 9 found similar to our result.

Study did by Settipane et al reported equal gender distribution with male 50.2% & female 49.8%.

A routine preoperative CT scan was done in all patients to know the extension of disease. Gheriani H et al found no statistically significant difference in outcome following FESS between those with minimal changes and those patients with more extensive involvement in CT scan. Total score of 24 (12 on each side is used). The patients in this study had a score of more than 8. 90% of the patients scored between 8-10. Study done by Sharp et al found significant correlation between Lund-Mackay preoperative score and outcome of FESS at 24 months.

Pre-operative Visual Analogue Score & Diagnostic Nasal Endoscopy

An assessment of severity and impact of symptoms on patient life was assessed by asking the patients about severity of symptoms and evaluation done by making on VAS of 0-10.

In our study maximum score given to nasal obstruction, nasal discharge followed by headache facial pain & olfactory disturbance. Although statistically not significant. Study by Ghera et al, Dufour X et al [10], Poetkar D et al [11], & Magdy et al [12] reported similar result.

Post-operative Visual Analogue Score & Diagnostic Nasal Endoscopy

In our study postoperatively follow-up was done at 3rd month found mean with conventional is very high as compare to microdebrider group. Follow up postoperatively @ 6th month mean 3.96 with microdebrider & 9.0 with conventional which clearly states that microdebrider is better tool to perform FESS than with conventional instruments.

Study done by Ghera B et al Statistically significant improvement was seen in microdebrider group as compared to conventional group p value= <0.001, Mean of total VAS postoperatively @ 3rd month was 1.62+3.30 and 0.57+1.76 at 6th month p value= < 0.001 in group 1 and 2.

Similar results was achieved by study done by Magdy et al & KakkarV et al [13] On Postoperatively DNE, the result was better in microdebrider group than conventional group because microdebrider is electrically powered shaver supplied with continuous suction. It precisely resect tissue minimising in adventitious tissue trauma & stripping thus avoiding excessive scarring and resultant postoperative complications.

Intra-operative Blood Loss and Duration to complete Surgery

In our study intra-operative mean blood loss in group A (C) =250 ml & Group B (M) =218ml p value= <0.001 i.e, significant. Study done by various authors are-

Study	Group 1 (M)	Group 2 (C)	Mean & P Value
Ghera et al	81.90 +7.26 ml	109.93+6.20 ml	P value significant
Christmas et al [14]	19.5 ml	44.5 ml	P value significant
R Singh et al [15]	181 ml	225 ml	P value significant
Krouse et al [16]	19.5 ml	44.5 ml	P value significant

Lesser bleeding because of continuous suctioning effect provides better visualisation & lesser traumatic surgery. Bernstein et al reported that conventional FESS causes more traumatic surgery because it involves use of Blakesley forceps. In our study total mean time needed to complete surgery in group A =75min with p value <0.001 & for Group B mean time =60 min in ml with p value= <0.001 i.e, significant. Other study comparison is below as follows-

Study	Group A (M)	Group (C)	Mean & P Value
Ghera B et al	55 minutes	64 minutes	P value < 0.001
Magdy et al	83+15 minutes	94+18 minutes	P value <0.005
Saafan et al [17]	92.33 minutes	123.63 minutes	P value not significant

Study done by Cornet M.E et al reported no significant difference between both groups regarding intraoperative blood loss & conventional group utilises 37% longer operating time as compared to microdebrider group.

Post-Operative Complications: As such there was no major complication encountered in both groups in our study due to careful imaging evaluation & surgical expertise. Minor complications were postoperative scarring, synechia formation & polyp recurrence were reported as – Scarring occurs due excessive mucosal injury and synechia

is created when there is mucosal contact during healing. Most common site is between lateral nasal wall & middle turbinate. Minimal tissue trauma and avoiding mucosal damage are important to minimise scarring and synechia formation and this is offered by microdebrider. 18 Stankiewicz Similar results reported by study done by Ghera B et al, Selivanova et al [19] and Bernstein et al [20].

Conclusion

Utility of the microdebrider promotes improved precision & controlled expeditious tissue removal thereby decreases intraoperative duration of

surgery, minimal intraoperative blood loss. Advantages of microdebrider is it is cost effective tool and it is multifunction may be achieved with a single instruments as it can work in narrow nasal cavity, proximity to skull base, provides better visualisation , less trauma to mucosa which will leads to better postoperative outcome in terms of crusting, synchaie & oedema. Although through better anatomical knowledge, good imaging, well skilled hands on & periodic follow up can reduce recurrence with both conventional as well as microdebider-assisted endoscopic polypectomy.

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