



A PROSPECTIVE COMPARATIVE STUDY BETWEEN CONVENTIONAL ENDOSCOPIC SINUS SURGERY AND MICRODEBRIDER ASSISTED SINUS SURGERY IN THE MANAGEMENT OF NASAL POLYPOSIS

ENT

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ABSTRACT

Introduction: Nasal polyps are edematous prolapsed mucosa of the nose and paranasal sinuses affecting about 4% of general population. The prevalence rate of nasal polyposis in the general population is considered to be around 4% and it increases with age, reaching a peak in individuals aged 50yrs. Microdebrider, a powered sinus instrument provides satisfactory results by making dissection faster, almost bloodless & safe, less rapid healing of tissues without harming normal mucosa. **Aim:** To compare conventional endoscopic sinus surgery with the microdebrider assisted sinus surgery in the surgical management of Nasal polyposis. **Materials And Methods:** In our study, we took 30 patients with bilateral nasal polyposis, both males and females above the age of 18 and previously unoperated and were divided into two groups. On the right side microdebrider assisted endoscopic sinus surgery was performed which was categorized the group1 and on left side patients underwent conventional endoscopic sinus surgery which was categorized as group 2. Thorough examination of the patients was performed and all the patients were subjected to visual analogue scoring(VAS) for symptoms. Mackay and Lund endoscopic score was used to grade the nasal polyps. A preoperative CT scan of paranasal sinuses was performed routinely and The Lund and Mackay staging system for radiological imaging was applied. **Results:** Our study included 30 patients of which 23 were males and 7 were females in the age group of 19 to 58 years . The most common symptom with which the patients with polyp presented was nasal obstruction (8.60) followed by nasal discharge(7.1) and facial pain(3.6) was the least common symptom. According to Lund and Mackay staging of CT scan of paranasal sinuses, maxillary sinus was the most commonly involved(100%) in the disease followed by anterior ethmoids>posterior ethmoids>frontal sinus, sphenoid sinus was the least common sinus to be involved (38%). We found out that patients who underwent excision of polyp by microdebrider technique had a better outcome when compared to patients who underwent conventional technique of beeding,time taken intraoperatively, as well as postoperative complications such as synechieae, crusting, scarring, recurrence. The postoperative complications were lesser in microdebrider method during the 3rd month of followup which was of clinical significance with p value of 0.06. However there was no significant difference between the two groups during the 6th month follow up. **Conclusion:** Microdebriders or the powered instruments assisted endoscopic sinus surgeries are better than the conventional technique for endoscopic sinus surgery in terms of operating time, intraoperative bleed as well as the postoperative outcome. Minimal mucosal damage in microdebrider assisted technique leads to minimal post operative scarring ,crusting, oedema, synechae formation among the patients undergoing microdebrider assisted endoscopic sinus surgery. However a thorough anatomical knowledge as well as goods hands on training is also an important factor in reducing the complications of endoscopic sinus surgery in both the techniques.

KEYWORDS

Nasal polyp; microdebrider; endoscopic sinus surgery

INTRODUCTION:

Sinonasal polyps are edematous prolapsed mucosa of the nose and paranasal sinuses affecting about 4% of general population.[1] The prevalence rate of nasal polyposis it increases with age, reaching a peak in individuals aged 50yrs and above with a male: female ratio of 2:1. Functional endoscopic sinus surgery, conventional or with powered instruments is standard surgical modality in sinonasal polyposis refractive to medical therapy. Microdebriders are the most commonly used powered instruments in endoscopic sinus surgery and continues to evolve in rhinologic surgery[2]. Microdebrider, provides satisfactory results by making dissection faster, almost bloodless & safe, less rapid healing of tissues without harming normal mucosa[3].

Aim:

The aim of this study was to compare the conventional endoscopic sinus surgery with the microdebrider assisted technique in the surgical management of Nasal polyposis.

MATERIALS AND METHODS:

We conducted a prospective comparative study in our department of ENT, MIMIS MEDICAL COLEGE , Nellimarla , vizianagaram , AP for a period of one year from july 2023 to july 2024 .All the patients diagnosed to have bilateral sinonasal polyposis, both males and females above the age of 18 years were included in the study. The study was conducted after taking the consent from the patients fulfilling the inclusion criteria. The inclusion criteria consisted of all the cases with bilateral sinonasal polyposis both males and females above the age of 18 and previously unoperated cases. Exclusion criteria consisted of patients who had active infection,any granulomatous conditions of the nose, bleeding disorders,history of any previous nasal surgeries, patients having unilateral disease and patients who had contraindication for surgery under general anaesthesia. In total , the study was conducted on 30 patients of which they were divided into 2

groups, of which on the right side microdebrider assisted endoscopic sinus surgery was performed which was categorized the group1 and on left side patients underwent conventional endoscopic sinus surgery which was categorized as group 2.

All the patients were subjected to visual analogue scoring(VAS) for symptoms of nasal blockage or nasal congestion, nasal discharge, olfactory disturbance, facial pain or pressure, headache and overall discomfort. Complete ENT examination including diagnostic nasal endoscopy was done in all cases. Mackay and Lund endoscopic score was used to grade the nasal polyps

A preoperative CT scan of paranasal sinuses was performed routinely and The Lund and Mackay staging system for radiological staging was applied.[4,5,6] (TABLE no1).

Table No1: The Lund And Mackay Ct Staging System For Paranasal Sinuses

Sinus system	Left	Right
Maxillary		
Anterior ethmoid		
Posterior ethmoids		
Sphenoids		
Frontal		
Ostiomeatal complex		
Total points		

All the patients were put on a brief course of systemic steroids for a period of 2 weeks and underwent a routine preoperative investigations. The patients underwent surgical procedure under general anaesthesia where in endoscopic microdebrider assisted sinus surgery was done on right side in group 1 and conventional endoscopic sinus surgery was used for the left side in group 2. Polyps which were removed during the

surgery were sent for histopathological examination. An intraoperative comparison was made between the two groups regarding the time taken for the procedure, amount of blood loss assessed subjectively as given in the table.(TABLE no2).

Table no 2: Grading of bleeding

Grade 0	No bleeding (cadaveric dissection)
Grade 1	Slight bleeding. No suctioning of blood required.
Grade 2	Slight bleeding. Occasional suctioning required. Bleeding does not threaten surgical field.
Grade 3	Slight bleeding. Frequent suctioning required. Bleeding threatens the surgical field for a few seconds after suction is removed.
Grade 4	Moderate bleeding. Frequent suctioning required. Bleeding threatens the surgical field immediately after suction is removed.
Grade 5	Severe bleeding. Constant suctioning required. Bleeding appears faster than can be removed by suction. surgical field is threatened and surgery is not possible.

Post operatively the patients were followed up after 1week, 1month, 3months and 6months and assessed subjectively for the symptoms by using VAS. Post operative pain, scarring, synechia, any recurrence of polyps were also assessed.

RESULTS:

Our study included 30 patients of which 23 were males and 7 were females in the age group of 19 to 58 years(fig.no1). The most common symptom with which the patients with polyp presented was nasal obstruction (8.60) followed by nasal discharge(7.1) and facial pain(3.6) was the least common symptom.(TABLE no3).

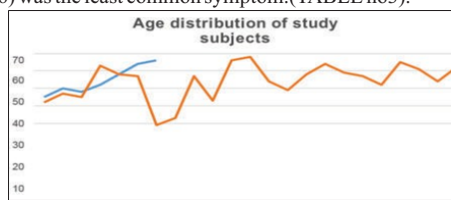


Figure no 1: Age distribution of study subjects

Table no 3: Pre OP visual analogue symptom scoring

Pre op symptom scoring using visual analogue scale						
	facial pain	headache	nasal block	discharge	olfactory disturbance	overall discomfort
MEAN	3.63	5.23	8.06	7.1	4.66	7.79
SD	1.22	1.6	0.89	0.73	1.76	0.8

According to Lund and Mackay staging of CT scan of paranasal sinuses, maxillary sinus was the most commonly involved(100%) in the disease followed by anterior ethmoids>posterior ethmoids>frontal sinus, sphenoid sinus was the least common sinus to be involved (38%)(TABLE no4).

Table no 3: Lund and Mackay staging of CT scan of paranasal sinuses

CT SCAN SCORING MACKAY SCORE				
	SINUS	GRADE1	GRADE2	GRADE3
1	MAXILLARY	9 (30%)	15(50%)	6(20%)
2	ANTERIOR ETHMOID	10(33%)	7(23%)	5(16%)
3	POSTERIOR ETHMOID	12(40%)	3(10%)	4(13%)
4	SPHENOID	8(26%)	2(6.66%)	1(3.33%)
5	FRONTAL	20(66%)	4(13.33%)	5(16%)

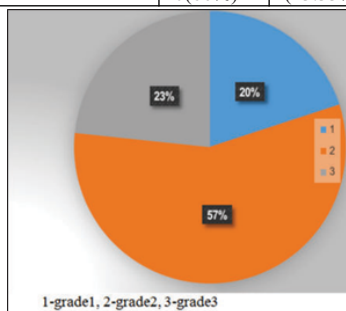


Figure no 2: Endoscopic grading of polyp

In the study we noticed that patients who underwent excision of polyp by microdebrider technique had a better outcome when compared to patients who underwent conventional technique in terms of bleeding, time taken(TABLE no 6) intraoperatively, as well as postoperative complications such as synechie, crusting, scarring, recurrence. The postoperative complications(synechie, crusting, scarring, recurrence) were lesser in microdebrider method during the 3rd month(TABLE no 5) followup which was of clinical significance with p value of 0.06 however there was no significant difference between the two groups during the 6th month follow up.

Table no 5: Post Op assessment Of Symptoms Using VAS

	At 3months				At 6 months			
	Mean		SD		Mean		SD	
	Grou p1	Grou p 2	Grou p1	Grou p 2	Grou p1	Grou p 2	Grou p1	Grou p 2
Facialpain	2.03	2.53	1.47	1.58	1.76	1.63	1.54	1.32
Headache	2.6	2.93	1.6	1.6	1.83	2.43	1.21	1.49
Nasal block	3.4	4.06	1.4	1.54	2.83	3.166	1.24	1.26
Nasal discharge	2.03	2.4	1.22	1.33	1.66	2.13	1.07	1.33
Olfactory disturbance	2.83	3.33	3.07	2.02	2.23	2.7	1.66	1.77
Overall discomfort	4.76	5.03	1.2	1.37	4.16	4.53	0.96	1.17

Table no 6: Time taken for the procedure in minutes

	MEAN	SD
GROUP 1	78.2	25.32
GROUP2	102.33	19.47

DISCUSSION:

The patients with nasal polyposis can be treated by medical management as well as by the surgical method. Most of the time the patients who have grade 1 polyp become symptomatically better with medical treatment and definitive surgery might not be necessary. Those patients with extensive polyps need to undergo surgical removal of the polyp either by microdebrider technique or conventional technique using nasal forceps. Blakesley forceps (Straight, 45 degree), Blakesley forceps Thru-Cut (Straight, 45 degree) are the most commonly used forceps in conventional technique. Functional endoscopic sinus surgery (FESS) is a minimally invasive technique in which sinus air cells and sinus ostia are opened under direct visualization. The main goal of this procedure is to restore normal sinus function and sinus ventilation. It was once believed that when the mucosa becomes chronically inflamed, it will be irreversibly damaged and has to be removed.[7] This was the ideology behind the Caldwell-Luc surgical technique, in which there was removal of the diseased lining of the maxillary antrum. Similarly, the external surgical approaches to the ethmoid and frontal sinuses were designed to be "radical operations" in which the disease was completely cleared. But the rationale behind FESS is to remove the localized pathology in the osteomeatal complex which is blocking the ostia and thus leading to inflammation in the dependent sinuses. The surgical interventions of the procedure were designed to remove the osteomeatal blockage and restore normal sinus ventilation and mucociliary function. [8,9] Microdebrider surgery, a technology with its roots in the rotary vacuum shaver introduced by Urban in 1968 for removal of acoustic neuromas, is now being successfully utilized for many different types of procedures. The microdebrider is a tool consisting of three key components. The console, controlled by a foot pedal, determines the speed and direction of the rotating blade. Blades can be rotated in forward, reverse, or oscillating modes at various speeds. Microdebriders have many advantages. The first includes the variety of tips that can be used. Depending on the type of procedure being performed, some available products can come with pre-bent tips, which allows for easier access to difficult surgical locations (like in paranasal sinuses). Some tips also allow for 360-degree rotation which allows for more accurate approaches to the tissue needing to be removed. Blades also can be adjusted with the microdebrider Straight-edged blades are more precise and can be less traumatic than other blades. While serrated blades provide a better grip for the surgeon. These blades can have the speed changed to allow for tighter precision of cutting as well as to cut bone. [10]

While the use of a microdebrider will not reduce the risk of bleeding, continuous suction allows the surgeon's vision of the surgical site to remain clear for much longer periods of time. This can reduce the overall surgical time required to perform the surgery by reducing the

number of time the surgeon needs to swap instruments. Some microdebrider manufacturers have added the ability to cauterize in the same instrument which further allows for less blood loss and less changing of instruments. One minor disadvantage associated with the use of the microdebrider in the surgical setting is the cost associated with both the unit and the replacement blades in comparison to more traditional tools. However, in actual practice, this is of little concern.[10] In our study we found out that the operating time taken for group 1 that is the microdebrider assisted endoscopic sinus surgery was less when compared to group 2 which was the conventional technique.

Cornet et al. showed that conventional techniques take 37% longer time for the procedure when done conventionally, compared to microdebrider assisted sinus surgery.[11] In terms of bleeding also group 1 had minimal bleeding intraoperatively when compared to group 2. A study by Ghera.b.et al. showed statistically significant mean intraoperative blood loss in microdebrider method which was 81.90+/-7.26 and in conventional technique it was found to be around 109.93+/-6.20.[12] A study by Dkuz Eylul university , Izmer, Turkey showed that microdebrider is easier and faster way of resecting polyp.[13]

However , a study by Selivanova et al. gave a slightly contrasting result wherein they used microdebriders as a form of powered instrumentation showed no statistical significance in surgical outcome of the patients.[14] Postoperatively , the improvement of the symptoms were assessed after 1 week, 1month,3months and 6 month by using visual analogue scale where in we found out that the complications were less in patients. Complications such as injury to the ororbis, subarachnoid hemorrhage, CSF fistula have been reported.

Bony dehiscence of anatomical structure is an exception to the safety of ocular and intracranial structures with this tool. Bhatti et al have reported 2 cases of ocular injury in their study of ocular motility complications after endoscopic sinus sugery with powered instruments.[15] In our study there were no intraoperative or immediate postoperative complication in patients who underwent surgery in either group.

CONCLUSION:

microdebriders or the powered instruments assisted endoscopic sinus surgeries are better than the conventional technique for endoscopic sinus surgery in terms of operating time , intraoperative bleed as well the postoperative outcome. Minimal mucosal damage in microdebrider assisted technique leads to minimal post operative scarring ,crusting, oedema, synechiaie formation among the patients undergoing microdebrider assisted endoscopic sinus surgery. However a thorough anatomical knowledge as well as goods hands on training is also an important factor in reducing the complications of endoscopic sinus surgery in both the techniques.

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