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A comparison of microdebrider assisted endoscopic sinus surgery and conventional endoscopic sinus surgery for sinonasal polyposis surgery

M A Eid, Y O Abdelrahman
Department of Otorhinolaryngology, Faculty of Medicine, Al-Azhar University Assuit, Cairo, Egypt

Abstract
Objectives: evaluate of outcome of surgery using microdebrider compared to conventional endoscopic sinus surgical instruments in the management of sinonasal polyposis.
Study Selection: This prospective randomized comparative study was conducted on 40 patients presented to ENT department at Al azhar university hospital-Assuit, diagnosed clinically and radiologically as bilateral sinonasal polyposis not responding to medical treatment. These patients were divided into two groups, 20 patients for each group. The first group Group A (microdebrider group) was operated using microdebrider and the second group Group B (standard Group) was operated using Messerklinger technique described by Stammberger using conventional instruments.
Data Synthesis: Data were collected, coded, revised and entered to the Statistical Package for Social Science (IBM SPSS) version 20.
Findings: There is a significant difference in intraoperative blood loss among both group. The intraoperative blood loss was significantly lower among patients who were operated with Microdebrider assisted FESS (Group A). The mean time of surgery in Group A was 120 minutes while the mean time of surgery in Group B was 173 minutes.
Conclusion: The use of microdebrider in endoscopic sinus surgery for patients with sinonasal polyposis has the advantage of dry operative field with better visualization and shorter operative time when compared to endoscopic surgery with the conventional instruments.

Keywords: microdebrider, sinonasal polyposis, fess, endoscopic, radiologically

Introduction

Nasal polyposis usually affects 1–4% of the population. Functional endoscopic sinus surgery (FESS) has been used for more than 20 years in the treatment of sinus diseases. [1]

Management of sinonasal polyposis is a difficult challenge for otolaryngologist. Nasal polyps may be managed medically and/or surgically. Surgical options include polypectomy and functional endoscopic sinus surgery (FESS) by Messerklinger traditional instrumentation technique. The aim of this technique is to remove the pathologic tissues inside the ostiomeatal complex units and to restore the corrupted mucociliary clearance and sinus ventilation without harming normal nasal physiology and anatomy. [2]

Nasal polyps are benign inflammatory and hyperplastic outgrowths of the sinonasal mucosa. Their most common manifestation is in patients with chronic rhinosinusitis (CRS).For this reason, the term chronic rhinosinusitis with nasal polyposis (CRSwNP) is frequently used when discussing the topic of nasal polyps. [3]

The introduction of the rigid endoscope for the diagnosis and surgical management of sinonasal disorders is the single greatest advance in rhinology to date. Endoscopy provided improved visualisation of the sinonasal anatomy and pioneered the way for sinus surgery to safety beyond the nasal cavity and paranasal sinuses. [4]

Functional endoscopic sinus surgery (FESS) is an effective treatment modality for sinus diseases, especially for patients who fail appropriate medical therapy. The outcomes of FESS have improved over time because of multiple factors like technologic advances, improved surgical training, and a better understanding of the disease's pathophysiology. [5]

The technical development started as long back as 1879 when Nitze developed small cystoscope which was subsequently used by Hirschman in 1901 for visualisation of the maxillary sinus via an oro-antral fistula. [6]

In the past several years the use of powered instrumentation for functional endoscopic sinus surgery has become more common, and the technique has been implanted as an attempt to provide increased safety in sinus surgery with decreased trauma to normal tissue. [7]

Introduction of powered instrumentation radically changed the performance of endoscopic sinus surgery. This technology finds specific application in addressing chronic rhinosinusitis (CRS) with nasal polyposis in its various forms [8].

One of the most recent advances and modifications of FESS technique is the application of the microdebrider, a powered instrument designed to exenterate disease with decreased trauma to normal tissues. [9]

Surgery for sinonasal polyposis is a challenge to the endoscopic surgeon due to increased surgical bleeding requiring frequent lens cleaning, lack of precise tissue removal and increase risk of complications like orbital or intracranial entry due to decreased visibility. [10]
Microdebriders have suction at the surgical site, so they offer the advantages of evacuating polypoid tissue from the surgical site without the need to remove the instrument providing potentially continuous suction of blood from the field with the opportunity for improved visualization and precision and for less frequent interruptions during surgery. [11]

Patients and Methods
This prospective randomized comparative study was conducted on 40 patients presented to ENT department at Al azhar university hospital-Assuit, diagnosed clinically and radiologically as bilateral sinonasal polyposis not responding to medical treatment. Time period of the study was 2 year i.e., from June 2019 to June 2021.Theses patients were divided into two groups, 20 patients for each group. The first group Group A (microdebrider group) was operated using microdebrider and the second group Group B (standard Group) was operated using Messerk linger technique described by Stammberger using conventional instruments.
In the Group A, the entire procedure completed using the microdebrider, including the sphenoethmoidectomy, frontal recess exploration, and maxillary antrostomy, according to extent of the disease the use of forceps during the procedure in this group will be minimal.

Inclusion criteria: All unoperated cases of bilateral nasal polypi was included in the study. Scoring system will be used for assessing patient symptoms using visual analogue scale (VAS) and total score of greater than or equal to 18 will be selected as a case for study. CT scan of cases showing Lund–Mackay total scor of equal to or more than 7 on each side was included in the study. The Lund and Mackay radiological staging system consists of a scale of 0-2 dependent on the absence, partial or complete opacification of the sinus system and the ostiomeatal complex (OMC) where 0 mean no abnormalities,1 mean partial opacification and 2 mean complete opacification. This is for all sinuses except OMC where 0 mean not occluded and 2 mean occluded. This scoring system derives a maximum score of 12 per side. All cases have normal coagulation profile.

Exclusion Criteria: recurrent sinonasal polyposis, Unilateral sinonasal polyposis patients wih bleeding disorder patients wih active infection, pregnancy, medically unfit patients for general anaesthesia due to any medical problem and patients who refuse operation or refuse sharing in the study.

Method of Collection of Data: Patients in whom disease persisted after conservative medical therapy were consented to take part in the study then they were divided into two groups, 20 patients for each group. The first group was operated using microdebrider (Group A) and the second group was operated using Messerklinger technique described by Stammberger using conventional instruments (Group B).

All patients were subjected to the following
Case history taking and investigations; as shown below: Personal history: Name, Sex, Age, And Occupation,
Residence and Phone number. Special habits: Smoking, Alcohol, and drug addiction (duration &number per day).
Complaint and its Duration: History of present illness: Nasal Obstruction; Nasal Discharge, olfactory disturbance, headache:, facial pain or pressurepostnasal drip, sneezing & Itching, swelling & Deformity: Onset, course, duration, orbital Symptoms: Proptosis, Diplopia, Epiphora & Vision, other ENT Symptoms: Ear, Mouth, Pharynx, Larynx & Head & Neck, general Symptoms: Fever, Rigors & Vomiting and symptoms of cranial nerve palsies. Then all patients was subjected to visual analogue scale (VAS) for Nasal obstruction, Nasal discharge, olfactory disturbance, Facial pain, Headache and Overall discomfort. Past history: Similar condition, trauma, medical diseases; Hypertension, diabetes mellitus, COPD,TB (tuberculosis), renal, cardiac or hepatic diseases, drug intake, nasal operation and surgical operations. Family history: e.g: Nasal polyps, Asthma, Aspirin sensitivity and cystic fibrosis.
General examination: Pulse- Blood pressure- Temprature- Respiratory rate -General condition. **Local Examination:** External nose. Anterior rhinoscopy: Endoscopic evaluation: Complete nasal examination including preoperative Direct Nasal Endoscopy (DNE) under local anaesthesia using rigid 4 mm sinuscope, zero degree and using 30 degree if necessary. Modified Lund-Mackay endoscopic scoring system was used: Preoperative for staging of nasal polyps and assesment of nasal discharge. Postoperative follow up at 3 months and 6 months for polyp recurrence, nasal discharge, synechiae and crusting Results graded according to: Extent of invasion of polyps: Stage 1 (extending to the middle meatus). Stage 2 (extending to areas beyond the middle meatus), nasal discharge: score 0(Absent discharge), score 1(clear, thin discharge) and score 2 (thick, purulent) and synechiae and crusting: score 0 (absent), score 1 (mild) and score 2 severe

Investigations: Radiological evaluation: Preoperative CT scanning of Nose and Paranasal sinuses, bone and soft tissue window and thin cuts (1 mm) coronal, axial and saggital replaning cuts. A preoperative CT scan of paranasal sinuses was performed routinely. The Lund and Mackay staging system for radiological staging was

applied. Score equal or more than 7 on each side was included in our study. Preoperative nasal steroid spray used 3 weeks befor surgery. Routine lab investigations: includes (C.B.C. – blood glucose level – serum creatinine – S.G.P.T. –S.G.O.T. - hepatitis markers &Coagulation profile (PT-PTT-INR-Bleeding time-Clotting time). Preoperative medical fitness by general medicine specialist, chest consultation if needed especially in asthmatic patients and cardiology consultation if needed.

Operative Techniques

Group A: (Figures 1-2) The 20 Patients underwent Microdebrider Assisted Endoscopic Sinus Surgery under general anaesthesia (14 males and 6 females) using STORZ endoscope (0 &45) degree of 4 mm diameter. These pledgets are then left in position for 10 minutes then we started the operation. The procedure was carried out by the microdebrider including polypectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy, sphenoidectomy and frontal recesss cleaning according to the extent of the disease. Cutting blades of microdebrider (straight and curved) were used in the oscillating mode at 3,000 rpm.

Fig 1: Removal (shaving) of right nasal cavity polyps using microdebrider.

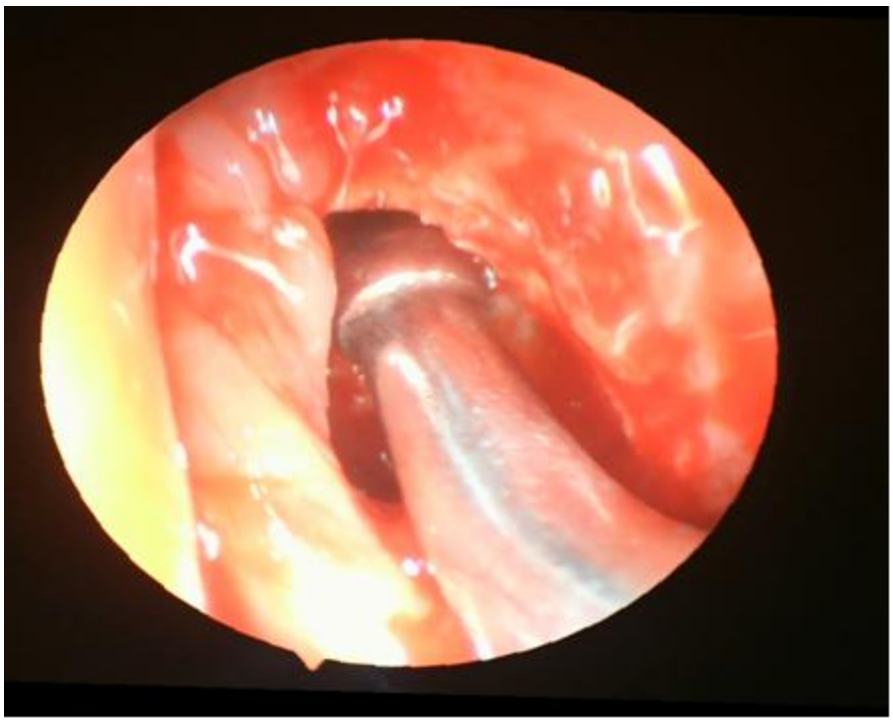

Fig 2: 45 degree endoscope of right side nasal cavity: (curved suction tip in frontal recess)

Group B: The other 20 Patients were operated using Messerklinger technique described by Stammberger using conventional endoscopic sinus surgery instruments like forceps and curette from anterior to posterior under general anaesthesia using STORZ endoscope (0 &45) degree of 4 mm diameter. The details of the procedures were explained and written informed consent was obtained as regard the general anaesthesia and procedures.

Postoperative care: Post-operatively patients was discharged on the 2nd day after removing nasal pack and started on normal saline nasal douches, Prophylactic antibiotic, and asked to continue steroid nasal spray. Postoperatively patients were followed up on 1st and 4th week, 3rd and 6th month subjectively with visual analogue score (VAS) and objectively by endoscopic examination of the operative cavities specifically for (recurrence of polyps, discharge, scarring or synechia, crusting) either bilaterally or unilaterally using the Modified Lund–Mackay scoring system as mentioned befor.
The amounts of crusting, scarring and synechiae were documented at each visit.

Statistical Analysis: Data were collected, coded, revised and entered to the Statistical Package for Social Science (IBM SPSS) version 20. The data were presented as number and percentages for the qualitative data, mean, conventional deviations and ranges for the quantitative data with parametric distribution and median with inter quartile range (IQR) for the quantitative data with non-parametric distribution

Results
Method of surgery (FESS) of 20 patients (50%) was Microdebrider assisted (Group A) and the other 20 patients (50%) was by using Conventional instruments (Group B). (Table 1)

Table 1: Method of surgery done on both groups.

Surgery	Frequency (%)
FESS using microdebrider group (Group A)	20(50%)
FESS using Conventional instruments(Group B)	20(50%)

10 patients (20%) between 21-30 years, 16 patients (40%) between 31-40 years, 12 patients (30%) between 41-50 years, and only two patient was >50. A large majority of the study patients lies in the age groups of 31-40 years (Table 2)
Mean age = 36 ys

Table 2: Gender distribution

Age group (in years)	Frequency	Percent %
21-30	10	25
31-40	16	40
41-50	12	30
>50	2	5
Total	40	100

Large majority of patients were male (75 %) □□□□□□%) of the patients were female (Table 3).

Table 3: Gender distribution

Gender	Frequency	Percent %
Male	30	75
Female	10	25
Total	40	100

According to Lund and Mackay radiological grading system CT of polyps: (Table 4-figure 3).

- Grade 2 (Complete Opacification) was founded in in 100% of patients in our study with anterior and posterior ethmoid sinuses involvement and in 80% of patients wih maxillary sinus involvement.
- Grade 1(Partial Opacification) was founded in 55% of patients with sphenoid sinus involvement and in 8% of patients with Maxillary sinus involvement
- Grade 0 (No Opacification) only founded in in 35% of patients with Frontal sinuses involvement.
- Grade 2 (Occluded) of Osteomeatal Complex (OMC) in all cases.

Table 4: Preoperative CT scan findings according to Lund Mackay Staging.

Affected sinuses	Grade 0 Number (%)	Grade 1 Number (%)	Grade 2 Number (%)
Maxillary	0	8 (20%)	32 (80%)
Anterior Ethmoida	0	0	40 (100%)
Posterior Ethmoida	0	0	40 (100%)
Sphenoid	0	22 (55%)	18 (45%)
Frontal	14 (35%)	10 (25%)	16 (40%)

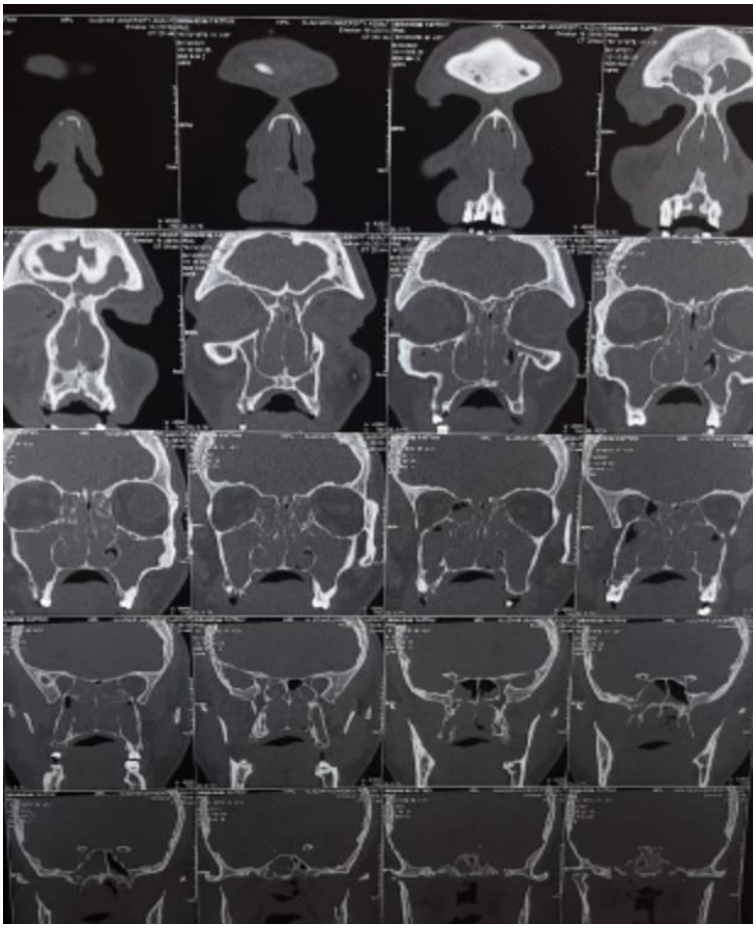

Fig 3: CT PNS with Sinonasal polyps shows - Grade 2 polyp in (maxillary sinus, ant.ethmoid, post.ethmoid and frontal sinuses bilaterally. – Grade 1 polyp in sphenoid sinus bilaterally.

There is no statistically significant difference in the pre-operative total mean VAS of all symptomes between Group A and Group B (P value >0.05).

In Group A the pre-operative visual analogue scale showed a higher mean score for nasal obstruction (8.6) followed by olfactory disturbence (6.8) &the lowest mean score was for the headache (4.1) and in Group B the pre-operative visual analogue scale showed a higher mean score for nasal obstruction (8.5) followed by olfactory disturbence (6.6) &the lowest mean score was for the headache (4.4) (Table 5).

Table 5: Pre-operative Visual Analogue scale (VAS) of both groups.

	Group A (No.=20)		**Group B (No.=20)**		**Independent t test**	
	Mean	SD	Mean	SD	t	P value
Nasal obstruction	8.60	0.66	8.50	0.69	-0.940	>0.05
Nasal discharge	6.10	1.89	6.60	1.54	-1.701	>0.05
Olfactory disturbence	6.80	2.71	6.50	2.12	-0.911	>0.05
Facial pain	4.30	2.63	4.50	2.26	-0.387	>0.05
headache	4.10	2.63	4.40	2.14	0.000	>0.05
Overall discomfort	6.80	1.07	6.60	1.44	0.250	>0.05
Total	36.7	1.688	37.1	*1.647*	-0.398	>0.05

- On endoscopic examination Grade 2 polyp (Polyp beyond middle meatus) was seen in 36 patients (90%) and Grade 1(Polyp in middle meatus only) in 4(10 %) patients. (Table 6-figures 4-5)
- On endoscopic examination nasal discharge was
- Thin and clear in 26 patients (65%) Score I
- Thick and purulent in 14 patients (35%) Score II

Table 6: Pre-operative Endoscopic findings according to Modified Lund Mackay Scoring system.

Endoscopic Polyp	**Frequency (%)**	**Nasal Discharge**	**Frequency (%)**
Grade 1	6(15%)	Score 1	24(60%)
Grade II	34(85%)	Score II	16(40%)

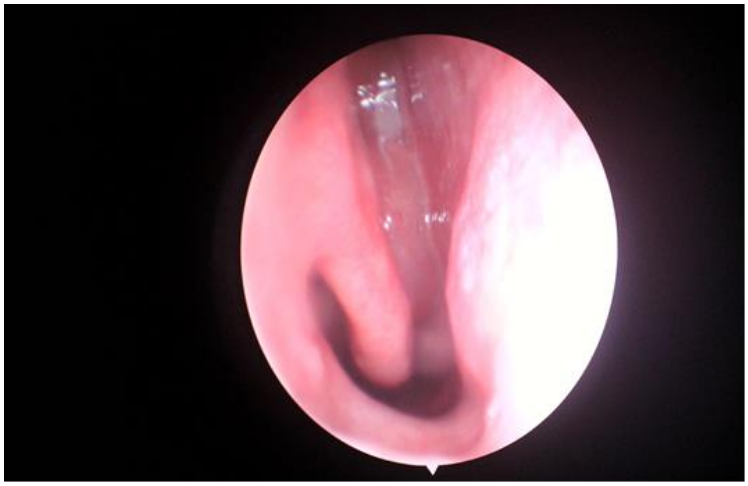

Fig 4: Rt. nasal cavity preoperative Grade 2 polyps.

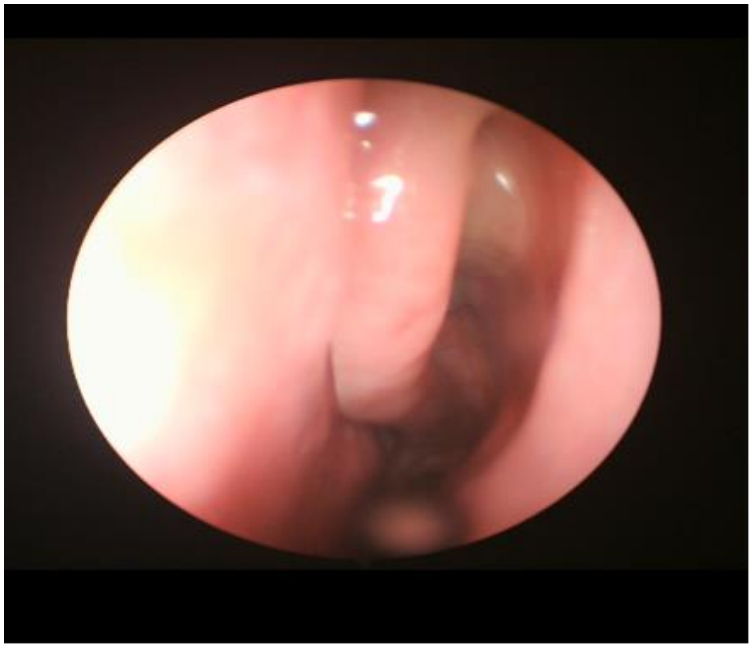

Fig 5: Lt. Nasal cavity preoperative Grade 1 polyp.

There is a significant difference in intraoperative blood loss among both group. The intraoperative blood loss was significantly lower among patients who were operated with Microdebrider assisted FESS (Group A). The mean time of surgery in Group A was 120 minutes while the mean time of surgery in Group B was 173 minutes. (Table 7)

Table 7: Intraoperative blood loss in ml and Duration of surgery (min) in both groups

	Group A (No.=20)				**Group B (No.=20)**				**p value**
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Blood loss in ml	220.50	30.99	190.00	300.00	310.50	36.91	190.00	320.00	<0.05
Duration of Surgery in minute	120	10.76	125.00	150.00	173.00	11.05	150.00	180.00	<0.05

An independent sample t test showed that there is No statistically significant difference in the total mean VAS scores of all symptoms (Nasal obstruction, Nasal discharge, olfactory disturbance, Facial pain, headache and Overall discomfort) between Group A and Group B at 3 months or 6 months postoperatively. In Group A there is statistically significant improvement in the mean VAS score of all symptomes after 3 months and after 6 months compared to preoperative. And in Group B there is statistically significant improvement in the mean VAS score of all symptomes after 3 months and after 6 months compared to preoperative. (Table 8)

Table 8: Comparison between Pre-operative & Post-operative (3months, 6 months) Total VAS score of each group

Group		Mean	SD	t test	P value
Group A	Pre oprative VAS	36.7	1.647	5.477	0.05<
	3 months VAS	13	0.657		
Group B	Pre oprative VAS	37.1	1.688	5.388	0.05<
	3 months VAS	12.6	0.426		
Group A	Pre oprative VAS	36.7	1.647	6.0780	0.05<
	6 months VAS	8.8	0.864		
Group B	Pre oprative VAS	37.1	1.688	6.1004	0.05<
	6 months VAS	8.3	0.773		

Although Postoperative endoscopic findings at 3 months and 6 months as discharge, crusting, synechiae formation and recurrence of polyp are lower in group managed by microdbrider but There was No significant statistical difference between both groups postoperatively at 3 months and 6 months.
P value >0.059 (Table 9-figures 6-7-8).

Table 9: All Postoperative Endoscopic findings of both groups at 6 months

		(Group A)	(Group B)	X^2	P value
Crusting	ABSENT	19(95%)	17 (85%)	1.111	0.*291* (>0.05)
	MILD	1(5%)	3(15%)		
Synechiae	ABSENT	19(95%)	18(90%)	0.36	0.*548* (>0.05)
	MILD	1(5%)	2(10%)		
Nasal discharge	Absent (score 0)	18(90%)	16(80%)	1.558	0.*693* (>0.05)
	Clear thin (score 1)	2(10%)	4 (20%)		
Recurrence of polyp	Absent	17(85%)	16(80%)	0.173	0.*677* (>0.05)
	Present	3(15%)	4 (20%)		

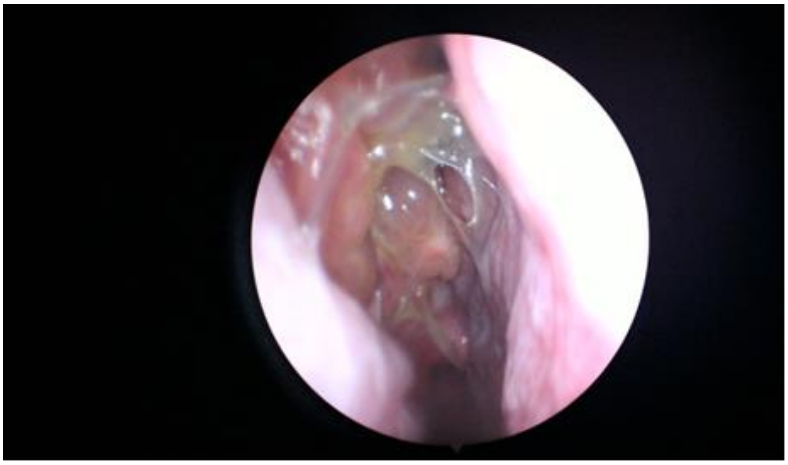

Fig 6: Endoscopic view of Postoperative recurrence of polyp at 6 months

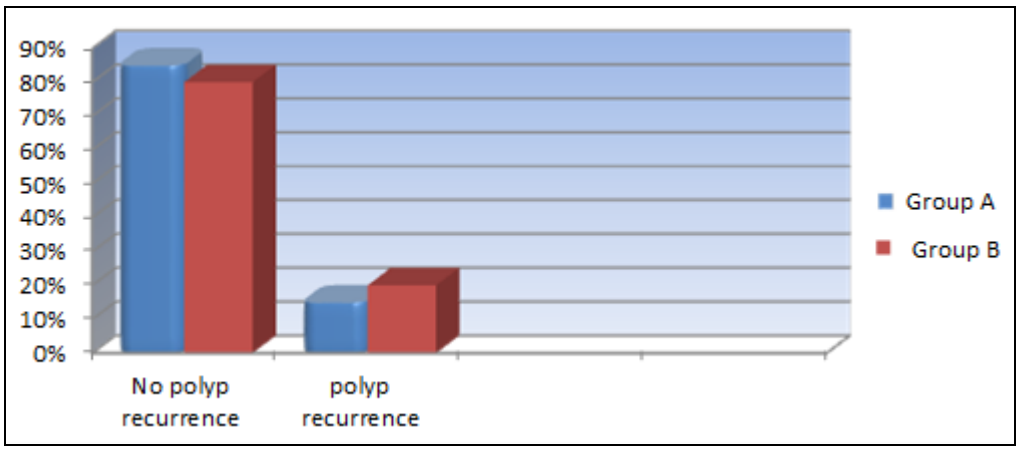

Fig 7: Post-operative recurrence of polyp of both groups at 6 months

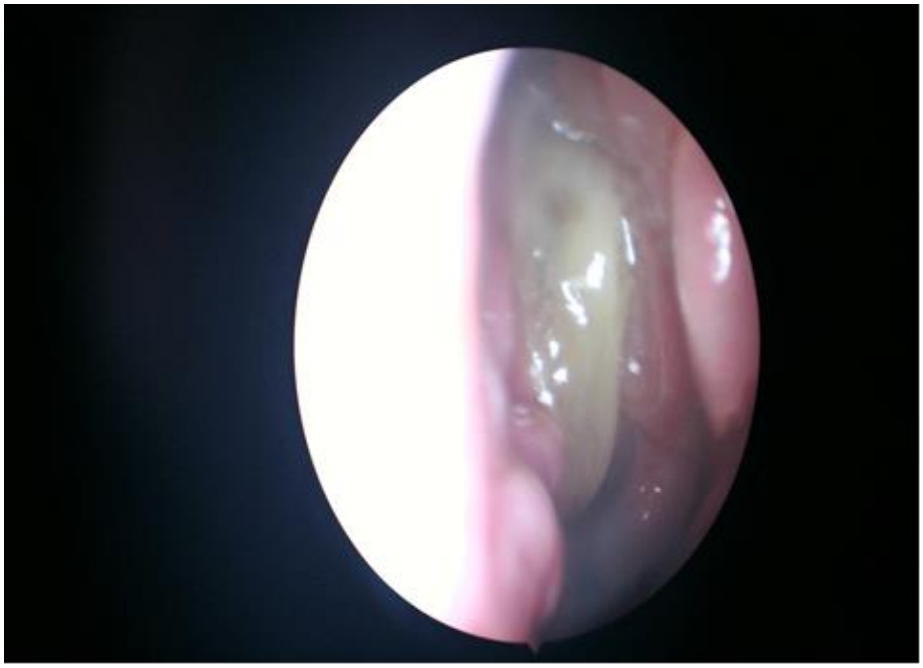

Fig 8: Endoscopic view of Postoperative thick nasal discharge at 3 months.

Discussion

In this study according to Modified Lund Mackay endoscopic Scoring system for nasal polypi: Grade 2 (Polyp beyond middle meatus) was seen in 34 patients (85%) and Grade 1 (Polyp in middle meatus only) in 6(15 %) patients. On endoscopic examination nasal discharge was thin and clear (Score I) in 26 patients (65%), thick and purulent Score II in 14 patients (35%).

Modified Lund Mackay Scoring system for endoscopic staging of nasal polypi in our study is conducted by Singh R *et al*., [12].

The Mackay and Lund endoscopic staging system used to grade the polyps with respect to middle meatus.Results were graded according to the extent of invasion of polyps. They were stage 1 (extending to the middle meatus), stage 2 (extending to areas beyond the middle conchae without reaching the floor of the nasal passage) and stage 3 (extending through the entire nasal passage) [13].

In this study an independent sample t test showed There is a significant difference in intraoperative blood loss among both group (p value <0.05). The intraoperative blood loss was significantly lower among Group A with mean blood loss =220.5 ml. Microdebriders have suction at the surgical site, so they offer the advantages of evacuating polypoid tissue from the surgical site without the need to remove the instrument providing potentially continuous suction of blood from the field with the opportunity for improved visualization and precision and for less frequent interruptions during surgery. Conventional instruments usually tear tissues and stripe the mucous membrane leading to increased bleeding with decreased visibility and increased frequency of complications and scarring [14].

N. Kanishka *et al*. in their Comparative Study between Conventional and Microdebrider Assisted Endoscopic Sinus Surgery for Sinonasal Polyposis reported that the intraoperative mean blood loss was significantly higher in the conventional groups [15], which agree with our study.

Singh R *et al*., [12] also in their prospective study on 40 patients observed that the amount of intraoperative bleeding in the Group A was 181 ml, compared with 225 ml in the Group B being operated by conventional methods which agree with our study.

In study by Bellad SA *et al*., [16] Intraoperatively, in the conventional technique most of the patients (73.3%) had moderate bleeding while with the use of microdebrider most patients (86.7%) had slight bleeding.

In this study an independent sample t test showed there is statistically significant difference in the meantime of surgery in both the groups (p value <0.05). The mean time for surgery was significantly lower among Group A with mean duration =130 minutes.

N. Kanishka *et al*. in their Comparative Study between Conventional and Microdebrider Assisted Endoscopic Sinus Surgery for Sinonasal Polyposis reported that the intraoperative mean duration of surgery was significantly higher in the conventional groups [15], which agree with our study.

In study by Ramiya Ramachandran Kaipuzha1 *et al*., [17] the mean percentage reduction in operative duration between the two groups was found to be 46.65%, which was very significant (p <0.01), This reduction in the mean operative duration in the microdebrider group may be explained by the extended time required to control haemorrhage in certain cases of the conventional group, so this is consistent with our study.

In study by Ghera B *et al*., [18] the average duration of surgery was 55 minutes in microdebrider group, compared with 64 minutes in the standard group so this is consistent with our study.

Magdy *et al*., [19] reported a statistically significant result ($p < 0.05$) for a shorter operative time in the powered endoscopy group (microdebrider 83±15minutes) when compared to conventional instrument group (94±18 minutes), which agree with our study.

T**here was no statistically significant difference in the total mean VAS scores of all symptomes between Group A and Group B at 3 months or 6 months postoperatively**.

In Group A there is statistically significant improvement in the mean VAS of all symptomes after 3 months and after 6 months compared to preoperative.

In Group B there is statistically significant improvement in the mean VAS of all symptomes after 3 months and after 6 months compared to preoperative.

N. Kanishka *et al*. in their Comparative Study between Conventional and Microdebrider Assisted Endoscopic Sinus Surgery for Sinonasal Polyposis showed postoperative (at 6th month) symptomatic relief of pre-operative symptoms (Nasal blockage, Nasal discharge, Olfactory disturbance, Headache &Facial pain) in both procedures using VAS with marked improvement seen in microdebrider group [15] which agree with our study.

Lageju *et al*, [20] reported that there was significantly decreased nasal obstruction in both the groups. There is no statistically significant Difference between microdebrider and conventional group regarding improvement of nasal obstruction which agree with our study.

Singh R *et al*., [12] in their prospective study reported that there was significant improvement in nasal symptoms including nasal obstruction in microdebrider than conventional group which is not consistent with our study.

In this study there was no significant statistical difference between the two groups postoperatively at 3 months and 6 months regarding the outcomes like discharge, crusting, synechiae and recurrence of polyp and no major intraoperative or postoperative complications occurred in both groups (ocular injury -severe bleeding -CSF rhinorrhea).

N. Kanishka *et al*. reported that there is no statistical significant difference between conventional group and microdebrider group regarding scarring or synechiae formation and recurrence of polyps at 6 months postoperative but this complication is higher in the conventional group as compared to the microdebrider group [15] which agrees with our study.

In study of Ramiya Ramachandran Kaipuzha1 *et al*, [17] showed reduced synechiae, minimal crust formation and rapid mucosal healing with the use of the microdebrider which is consistent with our study.

In a prospective study by Singh R *et al*., [12] there was no significant statistical difference between the two groups with respect to the outcomes like discharge, crusting, synechiae formation and recurrence of polyp, which agree with our study.

In a study by Saafan *et al*., [21] comparing powered instruments in FESS to conventional methods, there was a significant difference between the two groups regarding incidence of postoperative synechiae. The incidence of postoperative synechiae was significantly lower in powered endoscopic group ($P < 0.001$), which is not consistent with our study.

Finally Most studies reported good results with using the microdebrider in the management of sinonasal polyposis.

N. Kanishka *et al*. reported that Microdebriders are powered tools and since cutting and suction are combined in a single tool, this tool shorten the duration of surgery. It also offers a relatively bloodless field thus making visualization better for the operating surgeon and thus reducing trauma. As they are designed to precisely cut the tissue, mucosal preservation is better and thus postoperatively scarring and synechiae formation are minimized and healing occurs faster and postoperative complications are lesser and thus the patients shows a marked symptomatic improvement following microdebrider assisted endoscopic sinus surgery [15].

Lageju *et al*., [20] reported that use of microdebrider offered fewer incidences of synechiae and recurrence. But we couldn't find statistical advantage over conventional instruments.

Singh R *et al*., [12] reported that microdebrider assisted polypectomy is precise, relatively bloodless surgery though the precision depends on the surgeon's anatomical knowledge and operative skills. So they are helpful but not a prerequisite for successful outcomes in functional endoscopic sinus surgery. There is significant symptomatic improvement in cases undergoing microdebrider assisted surgery in experienced hands.

Tirelli *et al*., [22] reported that the Blakesley forceps caused a significantly lower recurrence rate than the microdebrider, but the latter proved to be more effective in preventing synechia formation.

Bernstein *et al*., [23] in their study of 40 cases of endoscopic sinus surgery performed with the microdebrider reported rapid mucosal healing, minimal crust formation, and a low incidence of synechiae formation.

The primary drawback of powered instruments continues to be the higher costs associated with their use, whereas their main advantage is the ability to accomplish multiple functions, such as bone removal, suction, and irrigation, with one tool. Recent advances in microdebrider technology now permit 360 degree, blade rotation, continuous tracking of the instrument using surgical navigation, and the ability to control bleeding with bipolar energy. A variety of specialty blades are also available, each attempting to address a specific operative limitation encountered during endoscopic surgery [24].

Knowledge of endonasal anatomy, surgical experience, a bloodless operating field, and being careful about every colour change during the operation are the fundamental essentials for lowering the complication rate. With its

lower incidence of complications, even in high-risk cases such as nasal polyposis, a microdebrider provides acceptable complication rates in ESS [25].

Conclusion

Using microdebrider compared to conventional endoscopic sinus surgical instruments in the management of sinonasal polyposis have advantages of saving Powered endoscopic sinus surgery offers a better therapeutic approach for patients with sinonasal polyposis when compared to endoscopic surgery with the conventional instruments. It provides dry operative field with better visualization and shorter operative time.This study proves that these instruments are helpful but not a prerequisite for successful outcomes in FESS.

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