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Original Research Article

Study of Efficacy of Microdebrider in Endoscopic Sinus Surgery

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Conflict of interest: Nil

Abstract

Background: The usage of microdebriders in endoscopic sinus surgery has increased recently. In this study, the benefits of the microdebrider in endoscopic sinus surgery are assessed in terms of blood loss during surgery, field visibility, operating time, and postoperative recovery.

Methods: The patients underwent Diagnostic Nasal Endoscopy. Using a 30-degree Hopkins Rod Endoscope 1st pass, 2nd pass, and 3rd pass were done. Middle meatus was examined in all patients and the polyps were graded according to the following classification. Score 'O' No polyps present; score I polyps confined to middle meatus; score II Polyps beyond middle meatus (reaching inferior turbinate or medial to middle turbinate); score III Polyps almost or completely obstructing nasal cavity. CT scan of paranasal sinuses: patients were subjected to CT and PNS and the degree of opacification and expansion of involved sinuses were noted.

Results: Out of n=50 cases operated in this study n=3 cases were operated for 120 minutes, n=4 cases were operated for 100 minutes, and n=4 cases were operated for 90 minutes. Similarly, n=13 cases required a time of 80 minutes, n=11 cases were operated for 70 minutes, n=10 cases were operated for 60 minutes and n=5 cases were operated for 50 minutes. In the n=30 cases of grade II polyp, the mean duration of surgery was 80 minutes and out of n=8 cases of grade III polyp the mean duration of surgery was 110 minutes. In this study based on the per-operative visibility was graded according to Boezaart & Van der Merwe Grading system.

Conclusion: In this study, the benefits of using a microdebrider during endoscopic sinus surgery were minimal blood loss during operation, even for grade III Polyposis, the typical surgical time was shorter, and the surgical field was visible. The study group's postoperative recovery went well, and there was excellent mucosal preservation following the surgery. Therefore, the use of soft tissue shavers or microdebrider in endoscopic sinus surgery could be advantageous and hence advocated to be used in cases wherever it is feasible.

Keywords: Endoscopic Sinus Surgery, Microdebrider.

Introduction

Endoscopes have significantly enhanced sinus surgery vision, yet Functional Endoscopic Sinus Surgery (FESS) has outgrown the surgical apparatus that is currently available. While surgical methods are constantly evolving. [1-3] the fundamental ideas behind the newer equipment have barely altered. With the FESS devices that are now on the market, surgeons frequently discover that they are unable to perform the precise and delicate surgery that the functional approach demands. [4] The objectives of careful cutting, a nearly bloodless field, unimpaired vision, and continuous removal of resected tissue are therefore still difficult to achieve. The tools thus far tend to separate the mucosa from the underlying bone. This method predisposes to more bleeding, which is the surgeon's worst enemy since it causes less visibility, which is the basis of difficulties. A technological constraint that adds to the stress for the surgeon and raises the patient's inherent risk is the absence of continuous suction at the surgical site. The laser was hence the focus of attention. Nevertheless, due to an increase in post-operative scarring and necrosis, interest in using lasers in endoscopic sinus surgery has diminished. By resecting only sick, obstructive tissue with very little blood loss, the microdebrider makes it easier to preserve mucosa and critical structures. [5] A notable advantage of this equipment is simultaneous continuous suction at the surgical site, which aids in resolving the well-known issue of blood pooling that raises the risk of operating morbidity. [6] The present study aimed to evaluate the efficacy of microdebrider in the overall ease of operative procedure duration of surgery and post-operative healing following the procedure.

Material and Methods

This cross-sectional study was conducted in the Department of ENT, Chalmeda Anand Rao Institute of Medical Sciences, Bommakal, Karimnagar, Telangana State. Institutional Ethical approval was obtained for the study. Written consent was obtained from all the participants of the study after explaining the nature of the study in vernacular language. The sampling method employed in the study was convenient sampling.

Inclusion criteria

1. Patients diagnosed to have Sinonasal Polyposis
2. Aged 18 – 60 years.
3. Males and females
4. Amenable to microdebrider surgery
5. Voluntarily willing to participate in the study.

Exclusion criteria

1. Skull base lesions
2. Pituitary surgeries
3. Chronic dacryocystitis
4. Tumors

The patients underwent Diagnostic Nasal Endoscopy. Using a 30-degree Hopkins Rod Endoscope 1st pass, 2nd pass, and 3rd pass were done. Middle meatus was examined in all patients and the polyps were graded according to the following classification. Score ‘O’ No polyps present; score I polyps confined to middle meatus; score II Polyps beyond middle meatus (reaching inferior turbinate or medial to middle turbinate); score III Polyps almost or completely obstructing nasal cavity.

CT scan of paranasal sinuses: patients were subjected to CT and PNS and the degree of opacification and expansion of involved sinuses were noted. The level of the skull base, cribriform plate, lamina papyracea, lacrimal duct and carotid artery, and optic nerve anatomy were also noted. Preoperative preparations: patients were given oral antibiotics for 2 weeks duration. They were also treated with oral steroids of 30mg prednisolone for 10 days pre-operatively. Assessment of blood loss was

made by collecting all the blood in the suction apparatus which was measured at the end of surgery. The amount of saline irrigation used was subtracted from the total. The blood collected was charted out and noted in milliliters. Duration of surgery was assessed from intubation time to infiltration up to the time of anterior nasal packing. The per-operative filed visibility was graded according to Boezaart & Van der Merwe Grading system. [7] The research group had excellent postoperative care for three weeks, including antibiotics, nasal saline douching, and middle meatal stents. After three weeks, the study group had a post-operative nasal endoscopy. Observations and grades for synechiae, crusts, middle meatus collapse, and residual illness were made.

Statistical analysis: All the available data was uploaded on an MS Excel spreadsheet and analyzed by SPSS version 21 in windows format. The continuous variables were denoted by mean, standard deviation, and percentages. The categorical variables were analyzed by chi-square test with p-values of < 0.05 was considered significant.

Results

In this study, a total of n=50 cases for endoscopic sinus surgery were taken out of which 28(56%) were males and 22(44%) were females. The age-wise distribution of cases in the study has been depicted in table 1. The age range of the cases in the study was from 18 years to 59 years and the mean age of the cohort was 37.58 ± 5.5 years. Most of the cases were from the age group of 31 – 40 years with 38% of all the cases in the study.

Table 1: Age-wise distribution of cases in the study

Age group	Frequency	Percentage
18 – 20	5	10.00
21 – 30	14	28.00
31 – 40	19	38.00
41 – 50	11	22.00
51 - 60	1	02.00
Total	50	100.00

Based on the grading of the polyps in the cases, 24% of cases had grade I polyps and 60% of cases were grade II polyps and 16% were grade III polyps. Out of the n=12 cases of grade I polyps the average blood loss was found to be 105 ml and out of n=30 cases of grade 2 polyps the mean blood loss was 120 ml and out of n=8 cases of grade III polyps the mean blood loss was 153 ml. The overall mean blood loss in the cases of the study was 108 ml the values have been depicted in figure 1.

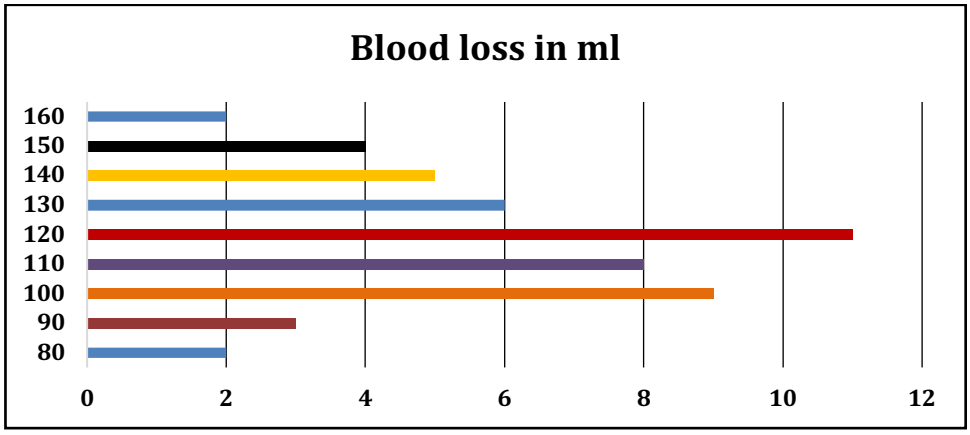

Figure 1: Showing the blood loss in ml in cases of endoscopic sinus surgery.

Out of n=50 cases operated in this study n=3 cases were operated for 120 minutes, n=4 cases were operated for 100 minutes, and n=4 cases were operated for 90 minutes. Similarly, n=13 cases required a time of 80 minutes, n=11 cases were operated for 70 minutes, n=10 cases were operated for 60 minutes and n=5 cases were operated for 50 minutes (figure 2). The mean duration of surgery in the cohort was 75 minutes. Out of n=12 cases of grade I polyp the mean duration of surgery required was 60 minutes. In the n=30 cases of grade II polyp, the mean duration of surgery was 80 minutes and out of n=8 cases of grade III polyp the mean duration of surgery was 110 minutes.

In this study based on the per-operative visibility was graded according to Boezaart & Van der Merwe Grading system. As shown in Table 2 we found 78% of the cases in the study were operated with grade 2 visibility and 16% were operated with grade I visibility and 6% were operated with grade III visibility no cases were found in grade IV and grade V visibility status.

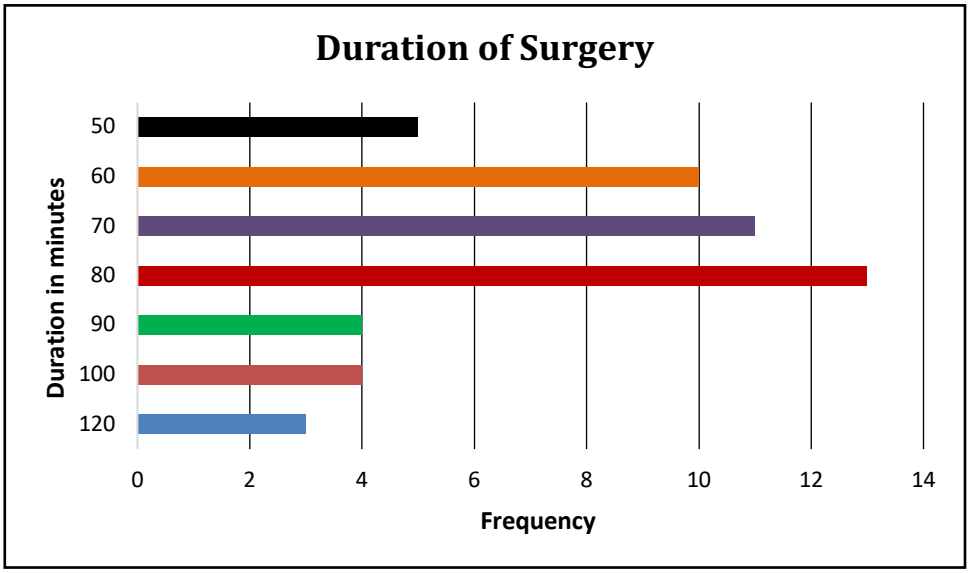

Figure 2: Showing the distribution of cases based on the duration of surgery.

Table 2: Per-operative filed visibility was graded according to Boezaart & Van der Merwe Grading system. [7]

Grades	Frequency	Percentage
Grade I	8	16.00
Grade II	39	78.00
Grade III	3	06.00
Grade IV	0	00.00
Grade V	0	00.00
Total	50	100.00

Post-Operative Healing: Out of the n=50 cases we found 74% of cases had Grade A post-operative healing, 18% cases had grade B post-operative healing and 8% had grade C post-operative healing.

Discussion

Several factors, including preoperative planning, surgical time, intraoperative bleeding, field visibility, and postoperative complications, were evaluated and compared in detail. [8] Infection should be reduced as much as feasible before elective surgery for inflammatory illness to minimize intraoperative bleeding. [9]

Based on this, the study group received antibiotics before surgery. Despite the absence of preoperative medicines in n=5 cases, there was no appreciable difference in blood loss or surgical visibility in these patients. [10] These n=5 cases did not differ in the length of the procedure from the patients that underwent preoperative planning. This study examined the benefit of the microdebrider in relation to the length of the procedure. [11] In our research group, the average length of the procedure was much shorter at 60 minutes. The amount of blood lost during endoscopic sinus surgery has been greatly decreased because of the use of microdebrider. [12] The injured mucous membrane may become stuck to the clot of blood, which can lead to middle meatal scarring. An unwanted outcome could be the collapse of the middle meatus. It hinders the maxillary, ethmoid, and frontal sinuses from being examined and may clog them, causing recurring or persistent illness. A weak middle turbinate is the root cause of middle meatus collapse. The collapse is caused by a fractured middle turbinate and the posterior removal of too much middle turbinate basal lamella. [13] The majority of the 60 patients in this research had satisfactory post-operative recovery. Most of the time, there were no crusts or synechiae. There was practically never a middle meatal collapse. Moriyama et al., [14] revealed that maintaining mucosa led to better functional outcomes in FESS. Powered shavers and the traditional FESS approach were used by Krouse and Christmas [15] to compare the outcomes. The shaver experienced much less blood loss, fewer synechiae development, a lower rate of ostial blockage, and quicker healing. [16]

Conclusion

In this study, the benefits of using a microdebrider during endoscopic sinus surgery were minimal blood loss during operation, even for grade III Polyposis, the typical surgical time was shorter, and the surgical field was visible. The study group's postoperative recovery went well, and there was excellent mucosal preservation following the surgery. Therefore, the use of soft tissue shavers or microdebrider in endoscopic sinus surgery could be advantageous and hence advocated to be used in cases wherever it is feasible.

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