ORIGINAL ARTICLE

A Comparative Study of Microdebrider Versus Cold Steel Instruments in Nasal Polypectomy: Recurrence Rates and Post Operative Synechiae Formation

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ABSTRACT

Objective: To evaluate and compare the effectiveness of microdebrider and cold steel instruments in nasal polypectomy, focusing on the recurrence of polyps and the formation of post-operative synechiae.

Study Design: Comparative observational study.

Place and Duration of Study: ENT department, Fauji Foundation Hospital Rawalpindi, from 1st July 2022 to 30th June 2023.

Materials and Methods: After the approval of the Hospital Ethical Committee, 96 patients from both genders between 10-60 years of age, presenting with nasal polyps, and fulfilling the selection criteria, were selected by non-probability consecutive technique. By lottery method two equal groups from these patients were formed, Group A & Group B. Patients in Group A underwent microdebrider assisted polypectomy while patients in Group B underwent surgery with cold steel instruments. After taking a detailed history and conducting a thorough ENT and general physical examination, nasal endoscopy was performed on all patients. CT scan PNS, both axial and coronal views were done. Post-operative follow ups of these patients were carried out in the 1st week, 3rd month and 6th month and all the patients were examined endoscopically. The data was expressed as frequency & percentage and analyzed using SPSS version 25.0.

Results: The mean age of the patients was 39.22 (±5.67) years. There were 36.5% females and 63.5% males. Recurrence of nasal polyps was observed in 54.2% patients. Postoperative synechiae formation was observed in 30.2% of patients. Recurrence was found to be statistically lower among patients in Group A, i.e., 41.7% vs 66.7% in Group B. (p=0.007). Postoperative synechiae formation was also found statistically lower among patients in Group A, i.e., 18.75% vs 41.7% in Group B. (p= 0.007).

Conclusion: The results indicated that the microdebrider was more effective than cold steel instruments in reducing the recurrence of nasal polyps and minimizing post-operative synechia formation in patients undergoing nasal polypectomy.

Key Words: *Cold Steel Instruments, Microdebrider, Recurrence, Synechiae Formation.*

Introduction

Nasal polyps are non-neoplastic masses of Sino nasal mucosa occurring because of recurrent or persistent inflammation of sinonasal mucosa.[1] It is the underlying chronic disease of the nasal mucosa that manifests as Nasal polyps and prevail in 1-4 % of the population.[2] Males are relatively affected more. About 25%-30% of patients with Chronic Rhinosinusitis (CRS) develop Nasal Polyposis.[3]

Patients present with nasal blockage, nasal discharge, postnasal drip, hyposmia, as well as a feeling of facial pressure persisting for a duration of over 12 weeks.[4] The quality of life of the patients having nasal polyps, due to these symptoms, is badly affected.[5] Nasal polyps may affect physical and emotional wellbeing and may even lead to sleep disturbances.[6] These patients may suffer from asthma along with these symptoms (Samter's triad) and may be sensitive to aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs).[7] These appear as unilateral or bilateral, single or multiple, mobile, smooth, grey, grape like masses originating from the middle meatus or spheno-ethmoid recess.[8]

Although diagnosis is clinical, imaging helps in assessing the disease and its potential complications as well as help in management planning. The initial

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management is medical, including topical intranasal steroid sprays/ local nasal drops or oral steroid therapy or both along with the use of antibiotics and antihistamines.[9] Surgery is the main option for the people who do not respond to medical treatment, or they have recurrence. Around 30-50% of people may require surgery, either by cold steel instruments or by microdebrider.[10] Conventional nasal polypectomy has almost been replaced by Endoscopic Nasal Polypectomy.

Surgery for Sino nasal polyposis is challenging due to higher chances of bleeding, obscuring the operating field, thus decreasing the chances of complete removal. Microdebrider or shaver is a powered instrument that gives better outcome by making dissection quicker and precise, ensuring clear visual field, thus leading to fast healing.[11]

Despite microdebrider's precision in removal of diseased mucosa, a controversy prevails regarding its superiority over endoscopic assisted conventional cold steel polypectomy. Moreover, a lot of work has not been done in Pakistan on this topic, as concept of use of microdebrider in FESS Nasal Polypectomy has not gained the popularity it deserves. Hence, we carried out this study with the aim to compare the use of microdebrider and cold steel instruments to see the frequency of recurrence and post-operative synechiae formation, in order to play our part in resolving this controversy.

Materials and Methods

A comparative observational study was undertaken from 1st July 2022 to 30th June 2023 at the ENT department, Fauji Foundation Hospital Rawalpindi. After approval of the Hospital Ethical Committee, vide their letter number 824/RC/FFH/RWP dated 5 January 2022, the sample size was calculated by the WHO calculator keeping the power of test equal to 80% and level of significance equal to 5%. Hence, 96 patients from both genders between 10-60 years of age, presenting with nasal polyps, and fulfilling the selection criteria, were selected by non-probability consecutive technique.

Informed consent of the study subjects was obtained. By lottery method two equal groups from these patients were formed, Group A & Group B. Patients in Group A underwent microdebrider assisted polypectomy while patients in Group B underwent surgery with cold steel instruments.

Proper history was taken, including history of atopy, aspirin sensitivity, asthma etc. Complete ENT and Head and neck and the general examination were carried out. Nasal endoscopy was performed on all the patients. CT scan PNS was carried out on all the patients with both axial and coronal views. The patients who had unilateral or congenital disease underwent surgery previously, or were immunocompromised, or had underlying malignancy or fungal etiology, were excluded from the study.

Post-operative follow ups of these patients were carried out in the 1st week, 3rd month and 6th month. All the patients were examined endoscopically to see any recurrence of nasal polyps and any synechiae formation.

The data was expressed as frequency & percentage and analyzed using SPSS version 25.0. The same software was used for analysis and the Chi-square test was applied between 2 groups to see recurrence and post-operative synechiae formation.

Results

A total of 96 patients were selected with the mean age of 39.22 (±5.67) years. Among them 55 (57.3%) patients were aged ≤40 years of age, while 41 (42.7%) patients were older than 40 years of age. (Figure 1)

Regarding gender distribution, 35 (36.5%) patients were females, and 61 (63.5%) patients were males. (Figure 1)

Recurrence of nasal polyps was observed in 52 (54.1%) patients, while postoperative synechiae formation occurred in 29 (30.2%) patients.

The recurrence was found significantly lower in Group A with 20 (41.7%) patients affected compared to 32 (66.7%) in Group B. (p= 0.007). (Table I).

Similarly postoperative synechiae formation was

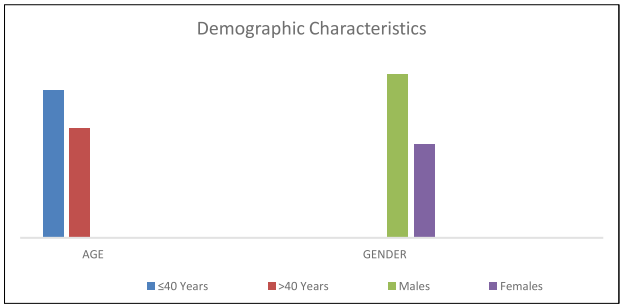

Figure 1: Demographic Characteristics of Study Participants (n=96)

significantly lower in Group A, occurring in 9 (18.75%) patients compared to 20 (41.7%) patients in Group B (p= 0.007). (Table II).

Table I: Recurrence of Polyps (n=96)

Group	Recurrence		Total	p-value
	Yes	No		
A (Microdebrider)	20 (41.7%)	28 (58.3%)	48 (100%)	0.007
B (Cold Steel Instruments)	32 (66.7%)	16 (33.3%)	48 (100%)	
Total	52 (54.2%)	44 (45.8%)	96 (100%)	

Table II: Postoperative Synechiae formation (n=96)

Group	Postoperative Synechiae Formation		Total	p-value
	Yes	No		
A (Microdebrider)	09 (18.75%)	39 (81.25%)	48 (100%)	0.007
B (Cold Steel Instruments)	20 (41.7%)	28 (58.3%)	48 (100%)	
Total	29 (30.2%)	67 (69.8%)	96 (100%)	

Discussion

Incidence of Nasal Polyps is usually found among people of ages between 40 to 60 years. Though the disease is more prevalent among males, but the disease is more severe among females.[4]

In the recent past, shavers or microdebriders emerged as a far better surgical tool than the conventional cold steel Nasal Polypectomy, due to less bleeding,less damage to the surrounding tissues, early healing and less crust and synechiae formation.[12] These are much more precise in removing the pathology, hence leading to lesser complications.[13]

However surprisingly, many of the recent studies do not consider that microdebriders give better results than the conventional instruments in attaining postoperative healing. In contrast, our study has shown that recurrence was found significantly lower among patients who underwent microdebrider assisted polypectomy than those who underwent conventional cold steel instruments polypectomy. Similarly, postoperative synechiae formation was also found significantly lower with microdebrider as compared to cold steel instruments. Our results do not differ from many of the studies. According to a study by Bellad, Manjunath & Ravi (2018), patients who underwent nasal polypectomy by microdebrider had lower recurrence rates and post-operative synechiae formation.[9] Observations of this study are like those of our study. Another study also showed that patients who underwent polypectomy by microdebrider had lower recurrence rates and post-operative synechiae formation as compared to cold steel instruments.[14] One local study also showed a little higher polyp recurrence rates in cold steel instruments as compared to microdebrider group while post-operative synechiae formation was 3.6% in microdebrider group as compared to 16.4% in cold steel group.[15]

But a study by Kaipuzha et al (2019) though showed better healing in microdebrider assisted polypectomies, but did not find any significant difference between the two instruments.[2] Another study was also of the same observations, though microdebrider assisted surgery was found relatively blood less.[16] Yet another study showed no significant difference between microdebrider assisted polypectomy with conventional nasal polypectomy regarding post-operative outcomes like scarring or recurrence.[17] Similarly another comparative study by Acharya et al (2023) also did not find any significant difference in the outcome either by microdebrider or the conventional nasal polypectomy.[18]

In contrast, a review study deduced that microdebrider assisted polypectomy resulted in more severe complications than the procedures carried out by conventional surgical instruments.[19]

Hopkins et al concluded that other factors like patient factors and disease characteristics were more important in causing complications rather than the surgical modality.[20] Another retrospective study concluded that complication rates of FESS were not high even in patients with severe nasal polyposis.[21]

However, it is a fact to be noted that microdebrider is quite expensive as compared to cold steel instruments surgery.[22] But it must be compared with the extra cost caused by revision procedures in the recurrent cases who underwent conventional nasal polypectomies.

The findings of the study have limitations like certain important effect modifiers that were not studied in the current study. Moreover, this study was carried out in only one hospital on a limited number of patients hence its findings cannot be generalized. In future, such studies at a more comprehensive level may be carried out to draw a more meaningful conclusion.

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Conclusion

The results indicated that the microdebrider was more effective than cold steel instruments in reducing the recurrence of nasal polyps and minimizing post-operative synechia formation in patients undergoing nasal polypectomy.

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CONFLICT OF INTEREST

Authors declared no conflicts of Interest.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon request.

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