

Comparison of Mean Pain in Conventional Milligan Morgan Versus Harmonic Scalpel Technique in The Treatment of Hemorrhoidectomy

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ABSTRACT

Objectives: To compare mean pain in conventional Milligan Morgan technique versus harmonic scalpel technique in patients undergoing hemorrhoidectomy for 3rd and 4th degree hemorrhoids.

Study design: Randomized controlled trial.

Setting: Department of Surgery, Lady Reading Hospital, Peshawar.

Duration: Six months from 12th August 2020 till 11th February 2021.

Materials & Methods: A total of 142 patients of both genders, between 18-65 years of age, diagnosed as cases of 3rd and 4th degree hemorrhoids were divided into two equal groups by lottery method. Patients in group A underwent hemorrhoidectomy by the conventional Milligan Morgan technique while patients in group B were subjected to harmonic scalpel hemorrhoidectomy. All patients were followed up at one month of surgery for evaluation of mean post-operative pain score. Data analysis was carried out by SPSS 23 taking p value ≤ 0.05 as significant.

Results: The mean age was 54.13 ± 17.33 years. The mean body mass index was 23.92 ± 2.82 kg/m². The mean Evans' ratio was 0.30 ± 0.07 . A total of 99 (46%) patients developed some degree of hydrocephalus while 116 (56%) had no evidence of the condition. The presence of hydrocephalus demonstrated a significant relationship with advancing age and high body mass index, with p values of 0.066 and 0.015, respectively.

Conclusion: Harmonic scalpel technique was significantly better than conventional Morgan Milligan technique in terms of lesser post-operative pain in patients undergoing hemorrhoidectomy for 3rd and 4th degree hemorrhoids.

Keywords: Hemorrhoidectomy, Harmonic scalpel, Morgan-Milligan technique, Postoperative pain.

INTRODUCTION

Hemorrhoids are a common anorectal condition affecting adults worldwide, often causing significant discomfort such as pain, bleeding, and itching.(1, 2) Surgical treatment remains the standard therapy for advanced cases, particularly grade III and IV hemorrhoids.(3, 4) Traditional Milligan-Morgan hemorrhoidectomy is considered a proven procedure but is frequently associated with significant postoperative pain and a longer recovery time.(5, 6)

Over the past two decades, new surgical technologies such as the Harmonic Scalpel, an ultrasound-based dissection tool, have emerged, enabling precise incisions, reducing tissue trauma, and improving hemostasis. Studies suggest that the use of the Harmonic Scalpel may be associated with less postoperative pain, shorter operating times, and greater patient satisfaction.(7)

The traditional Milligan-Morgan hemorrhoidectomy is considered a reliable procedure but is often associated with significant postoperative pain and a longer recovery time. (8) The aim of this study is to compare the mean postoperative pain scores between conventional Milligan-Morgan hemorrhoidectomy and the Harmonic Scalpel technique in order to identify the more effective method in terms of pain reduction and patient comfort.

Objective: To compare mean pain in conventional Milligan Morgan technique versus harmonic scalpel technique in patients undergoing hemorrhoidectomy for 3rd and 4th degree hemorrhoids.

MATERIALS AND METHODS

Study Design: Randomized Controlled Trial.

Study setting: Department of Surgery, Lady Reading Hospital, Peshawar.

Duration of the study: Duration of the study was 6 months (from 12th August 2020 to 11th February 2021).

Sampling Technique: Non-probability Consecutive sampling technique was used for the recruitment of patients.

Sample size: The sample size was calculated on WHO formula for sample

size calculation by keeping 1.2 ± 0.410 as mean pain score in harmonic scalpel technique and 3.9 ± 0.610 mean pain score in Milligan-Morgan technique in patients undergoing hemorrhoidectomy, keeping the confidence interval as 95% and power of the test at 80%. The sample size calculated was 142 patients which were divided in two groups consisting of 71 patients in each group.

Inclusion Criteria:

Patients of both genders.

Patients with ages between 18 and 65 years.

All the patients undergoing hemorrhoidectomy with 3rd and 4th degree hemorrhoids.

Duration of disease more than one month..

Exclusion Criteria:

All the patients with Grade I and Grade II hemorrhoids.

Patient with history of bleeding diathesis (diagnosed by history of bleeding and coagulation profile).

Colorectal carcinoma (diagnosed on medical record and history).

Ulcerative colitis (diagnosed on medical record and history).

Patients with chronic obstructive pulmonary disease (diagnosed on history, examination and spirometry).

Chronic constipation (diagnosed on history, examination).

Bladder outlet obstruction (diagnosed on history, examination and U/S).

History of previous anal surgeries.

Methods: The current study was carried out after taking approval from hospital ethical committee and approval of synopsis from CPSP REU. All the patients meeting the inclusion criteria i.e. undergoing hemorrhoidectomy with 3rd and 4th degree hemorrhoids, with duration of disease more than one month were enrolled in the study through OPD of Surgery Department of Lady Reading Hospital, Peshawar. Written informed consent was taken after explaining the purpose and benefits of the study. Initial assessment of symptoms based on history and clinical examination including digital rectal and proctoscopic examination was done and this included explanation of the procedure itself as well as post-procedure pain and complications like bleeding, infection, sepsis and recurrence. All the included patients were randomly allocated in two groups by lottery method consisting of 71 patients each. Patients in group A were subjected to Milligan Morgan hemorrhoidectomy and patients in group B were subjected to harmonic hemorrhoidectomy. All the patients underwent surgery under spinal anesthesia in the main operation theater of Lady Reading Hospital, Peshawar. All the surgeries were performed by a trainee under the supervision of expert General Surgeon (FCPS) having at least five years of post-fellowship experience. After the surgery, all the patients were advised standard 61 post-surgical medication which included diclofenac with a dose of 50 mg twice daily and Sitz bath and the post-operative treatment was kept strictly uniform in both groups. All the patients were followed up at the end of one month for evaluation of post-operative mean pain score according to VAS. Mean pain score was assessed on the basis of criteria defined in the operational definitions. All the information i.e. age, gender, weight, height, BMI, grades of hemorrhoids, obesity, and presence of diabetes mellitus was entered in proforma (attached in the end). The exclusion criteria was strictly followed to avoid bias in study results.

Statistical analysis: Data was analyzed using SPSS version 23. Frequencies and percentages were computed for categorical variables i.e. gender, grade of hemorrhoids, obesity, and diabetes mellitus. Mean and standard deviation was computed for continuous variables i.e. age, weight, height, BMI, and mean pain score. Mean pain score was compared in both the groups by applying the independent sample T test keeping $p \leq 0.05$ as significant. Mean pain score in both the groups was stratified among age, gender, BMI, grade of hemorrhoid, obesity, and diabetes mellitus to see the effect modifications. Post stratification independent T test was applied keeping $p \leq 0.05$ as significant.

RESULTS

The mean age of the participants was 43.38 ± 10.89 years. Group A had a mean age of 43.38 ± 10.89 years compared to

44.19±10.85 years in Group B. The mean height was similar between the groups (168.07±10.62 cm in Group A and 168.27±10.09 cm in Group B). Group A had a higher mean weight (72.80±13.61 kg) than Group B (69.28±9.66 kg), resulting in a correspondingly higher mean BMI of 25.71 ± 3.72 kg/m² in Group A versus 24.51 ± 2.83 kg/m² in Group B. The pain score was notably higher in Group A (3.73±0.88) compared to Group B (1.72±0.74).

The distribution of baseline characteristics between Group A and Group B showed no significant differences in age or gender, with most participants falling within the 34–49-year range and males being slightly more prevalent in both groups. BMI categories demonstrated a significant difference ($p=0.03$), with Group B having a higher proportion of individuals in the normal BMI range (19–25 kg/m²), while Group A had more participants in the higher BMI categories. Hemorrhoid grades were comparable between the groups ($p=0.46$), with Grade 3 being the most common. Obesity was significantly more frequent in Group A compared to Group B ($p=0.01$). Diabetes status did not differ significantly between the groups, with similar proportions of diabetic and non-diabetic individuals ($p=0.60$).

Across all age groups, pain scores were consistently higher in Group A than in Group B, with significant differences observed for participants aged 18–33, 34–49, and 50–65 years ($p\leq0.001$). A similar pattern was noted for both genders, as males and females in Group A reported markedly higher pain scores than those in Group B ($p=0.00$). BMI categories also showed significantly elevated pain scores in Group A for individuals with BMI 19–25 kg/m² and 26–30 kg/m²; however, the difference was not statistically significant in the 31–35 kg/m² category ($p=0.112$). Pain scores differed significantly between the groups for both Grade 3 and Grade 4 hemorrhoids ($p=0.00$). Obese participants showed no significant difference in pain scores between the groups ($p=0.11$), while non-obese individuals had significantly higher scores in Group A ($p=0.00$). Among both diabetic and non-diabetic patients, pain levels were significantly higher in Group A compared to Group B ($p=0.00$).

Table 1: Descriptive characteristics of the participants ($n=142$)

Variables	
Age (Years)	43.38±10.89

Table 2: Comparison of Demographic and Clinical Characteristics Between Group A and Group B ($n=142$)

Variables	Group A	Group B	p-Value
Age Groups			
18-33 years	14(19.7%)	16(22.5%)	0.59
34-49 years	39(54.9%)	33(46.5%)	
50-65 years	18(25.4%)	22(31.0%)	
Gender			
Male	44(62.0%)	43(60.6%)	0.86
Female	27(38.0%)	28(39.4%)	
BMI (Kg/m ²)			
19-25	40(56.3%)	50(70.4%)	0.03
26-30	19(26.8%)	18(25.4%)	
31-35	12(16.9%)	3(4.2%)	
Grade of Hemorrhoids			
Grade 3	47(66.2%)	51(71.8%)	0.46
Grade 4	24(33.8%)	20(28.2%)	
Obesity			

Yes	12(16.9%)	3(4.2%)	0.01
No	59(83.1%)	68(95.8%)	
Diabetes Status			
Diabetic	27(38.0%)	24(33.8%)	0.60
Non-diabetic	44(62.0%)	47(66.2%)	

Table 3: Comparison of Baseline Anthropometric Characteristics and Pain Scores between Group A and Group B (n=142)

Variables	Group A	Group B
Age (Years)	43.38±10.89	44.19±10.85
Height (cm)	168.07±10.62	168.27±10.09
Weight (kg)	72.80±13.61	69.28±9.66
BMI (kg/m2)	25.71±3.72	24.51±2.83
Pain score*	3.73±0.88	1.72±0.74

* P-Value= 0.000

Table 4: Stratification of Pain score on the basis of demographic characteristics among both groups (n=142)

Variables	Pain score		p-Value
	Group A	Group B	
Age Groups			
18-33 years	3.79±0.89	1.75±0.78	0.001
34-49 years	3.64±0.90	1.67±0.69	0.00
50-65 years	3.84±0.83	1.77±0.81	0.00
Gender			
Male	1.77±0.87	1.81±0.73	0.00
Female	3.74±0.90	1.57±0.74	0.00
BMI (Kg/m2)			
19-25	3.68±0.86	1.70±0.74	0.00
26-30	3.58±0.84	1.61±0.70	0.00
31-35	4.17±0.94	2.67±0.58	0.112
Grade of Hemorrhoids			
Grade 3	3.68±0.89	1.67±0.68	0.00
Grade 4	3.83±0.87	1.85±0.88	0.00
Obesity			

Yes	4.17±0.94	2.67±0.58	0.11
No	3.64±0.85	1.68±0.72	0.00
Diabetes Status			
Diabetic	3.78±0.89	1.83±0.76	0.00
Non-diabetic	3.70±0.88	1.66±0.73	0.00

DISCUSSION

The introduction of sophisticated hemostatic electrosurgical and ultrasonic devices during the last twenty years has revolutionized surgical practice. Among these, the Harmonic Scalpel, an ultrasonic dissector, has been used extensively and effectively in both laparoscopic and open surgeries. Following hemorrhoid surgery, postoperative pain is still a major concern since it frequently causes severe discomfort and lowers patient satisfaction. Because they can increase patient compliance and procedure acceptance overall, methods that reduce postoperative discomfort are quite beneficial. In this regard, the current study contrasted harmonic scalpel hemorrhoidectomy with traditional Milligan-Morgan hemorrhoidectomy (MMH) to ascertain whether procedure results in less discomfort following surgery and to evaluate if variables like obesity or diabetes mellitus affect pain outcomes.

In our study, the mean age was 43.38 ± 10.89 years in the MMH group and 44.19 ± 10.85 years in the harmonic scalpel group. These findings align with those of Kumar et al.(9), who reported similar mean ages of 42 years for the MMH group and 45 years for the harmonic group. Likewise, Ahmed et al. (10) documented a comparable mean age of 40.04 ± 9.29 years in the MMH group and 41.68 ± 11.18 years in the harmonic group. However, Lim et al.(11) from Korea reported notably younger mean ages of 20.40 ± 1.6 years for the MMH group and 22.4 ± 5.0 years for the harmonic group.

Our study also revealed a higher proportion of male patients (61.3%). This is consistent with the findings of Fayyaz et al (12), who reported a male frequency of 67.7%. In contrast, Kumar et al. (9), and Ahmed et al. (10) observed lower male proportions of 48.3% and 47%, respectively. Additionally, the majority of patients in our study (69%) presented with Grade III hemorrhoids, a pattern comparable to that reported by Kumar et al., who found a frequency of 63.3% for Grade III disease.

In our study, the mean pain score was 3.73 ± 0.878 in the MMH group compared with 1.72 ± 0.740 in the harmonic scalpel group, a difference that was statistically significant ($p < 0.001$). This difference remained significant across all subgroups, including age, gender, BMI, hemorrhoid grade, obesity status, and the presence of diabetes mellitus. These findings are consistent with previous studies. Kumar et al. (9) reported a mean pain score of 3.9 ± 0.6 for the MMH group versus 1.2 ± 0.4 for the harmonic group ($p < 0.05$). Lim et al. (11) similarly observed lower pain scores in the harmonic group, reporting 1.5 ± 1.2 for MMH and 0.8 ± 0.8 for harmonic hemorrhoidectomy ($p < 0.05$). Fayyaz et al. (12) also demonstrated significantly reduced pain with the harmonic scalpel, with a mean score of 1.92 ± 0.60 compared to 5.54 ± 0.862 in the MMH group ($p = 0.000$).

Overall, the findings of our study were consistent with both local and international research. A key limitation, however, was the lack of comparison regarding the financial implications of the two surgical techniques, as the harmonic scalpel is relatively expensive. Future studies incorporating a cost-benefit analysis would provide a more comprehensive evaluation. Despite this, the harmonic scalpel demonstrated clear advantages, being quick, user-friendly, and effective, with notable reductions in postoperative pain and operative time. Our results support the study hypothesis, confirming that postoperative pain was significantly lower with harmonic scalpel hemorrhoidectomy compared to the conventional Milligan-Morgan technique.

CONCLUSION

It was concluded that hemorrhoidectomy with Harmonic scalpel was significantly better than the conventional Morgan Milligan thyroidectomy technique in terms of lesser mean postoperative pain according to VAS. Therefore, on the basis of our findings we recommend the use of harmonic scalpel for hemorrhoidectomy in patients presenting with Grade III and IV hemorrhoids...

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