

Comparison of harmonic scalpel versus Milligan Morgan technique in haemorrhoidectomy patients

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Abstract

Objective: To compare the efficacy of harmonic scalpel versus Milligan Morgan technique in patients undergoing haemorrhoidectomy.

Methodology: The comparative study was conducted at the General Hospital, Lahore, Pakistan, from March to September 2019, and comprised patients undergoing haemorrhoidectomy who were randomised into haemorrhoidectomy group A and open haemorrhoidectomy group B which was exposed to the Milligan Morgan procedure. Data was collected through a predesigned questionnaire. Data was analysed using SPSS 25.

Results: Of the 60 patients, there were 30(50%) in group A; 17(56.7%) males and 13(43.3%) females with an overall mean age of 44.6±7.6 years. The remaining 30(50%) patients were in group B; 19(63.3%) males and 11(36.7%) females with an overall mean age of 43.8±8.2 years. In group A, mean operative time was 20.8±2.8 minutes, while it was 26.5±2.8 minutes in group B ($p=0.001$). In group A, mean convalescence period was 9.7±2.9 days, while it was 13.4±3.7 days in group B ($p=0.001$). Group A required less time for complete wound healing compared to group B ($p<0.05$).

Conclusion: Harmonic scalpel haemorrhoidectomy was found to be an advantageous method compared to the Milligan Morgan technique in patients undergoing haemorrhoidectomy.

Keywords: Harmonic scalpel, Milligan Morgan, Haemorrhoidectomy, Haemorrhoids. (JPMA 71: 2369; 2021)

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Introduction

Haemorrhoids is defined as a pathological condition in which vascular structures of the anal canal help stool control.¹ Swollen and inflamed haemorrhoidal venous cushions are known as piles. The actual prevalence of haemorrhoidal disease is unidentified, but few pieces of evidence suggested growing prevalence over time. Harmonic scalpel (HS) is an instrument that uses ultrasonic sensations and readily incises and congeals soft tissues.² Milligan Morgan (MM) technique is believed to be an exemplary haemorrhoidectomy procedure.³ Approximately 40% of haemorrhoids patients are asymptomatic.⁴ Those with signs and symptoms of haemorrhoids usually seek treatment for defecation, pain related to blood-clotting haemorrhoids, anal itching or encopresis.¹

Clinically, haemorrhoids are classified into four grades. In grade-I, 72.89% were recorded as cases of bleeds only, in grade-II, 18.42% had no prolapse, in grade-III 8.16% and grade IV 0.53% had prolapsed condition.⁵ Conventional medical therapy is generally used for grade-I and II haemorrhoids, but grades III and IV need surgical

involvement.⁶ Grade-I haemorrhoids was visualised on endoscopy and may swell into the lumen without prolapse underneath the dentate line.⁷ In grades II-IV, haemorrhoids prolapse out of the anal canal with faecal discharge. In grade-II it reduces impulsively, grade-III requires manual reduction, and grade-IV is irreducible.

Ultrasonic vibration simultaneously cuts and coagulates soft tissues via the HS device.⁸ MM (opened) was modified by Ferguson haemorrhoidectomy (closed) and uses electro-cautery haemorrhoidectomy technique. For the surgical treatment of symptomatic haemorrhoids, MM is still considered the gold standard.⁹ Ferguson haemorrhoidectomy is quite risky as it involves difficulties, including postoperative bleeding, soreness, urine retention and anal stricture.¹⁰ It is reported that about half of the population aged >50 years has haemorrhoids.¹¹

Studies have reported advanced haemorrhoidal disease and techniques which are developed to lessen postoperative illness and dysfunction.¹² HS method leads to complete wound healing in six weeks, while MM requires almost three months.¹³ Studies have also reported that pain in HS haemorrhoidectomy was less compared to the electro-cautery method, and this difference was also identifiable in analgesic ones.¹⁴ Even in developed countries, the disease has increased. Approximately 10 million Americans are said to be affected each year, with a prevalence of 4.4%.¹⁵ The causative agents for

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haemorrhoidal development include prolonged straining constipation.¹⁶

The current study was planned to compare HS and MM techniques in patients undergoing haemorrhoidectomy.

Patients and Methods

The comparative study was conducted at the General Hospital, Lahore, Pakistan, from March to September 2019, and comprised patients undergoing haemorrhoidectomy. After approval from the institutional ethics review committee, the sample size was calculated by using mean values of convalescence period as 7.4±3.6 days for HS method and 18.6±5.4 days for MSM technique, with 95% confidence interval (CI) and power of test 80%.¹⁴ The sample was raised using non-probability consecutive sampling technique from among patients of either gender aged 30-60 years with clinical diagnosis of grade-III and IV haemorrhoids. Those with recurrent haemorrhoids, history of previous surgery for haemorrhoids, and patients having a history of any chronic disease were excluded. After taking informed consent from the participants, they were randomised into HS group A and MM group B using the lottery method. All the patients underwent the procedure under spinal anaesthesia and aseptic measures by a single surgical team.

Data was collected using a self-generated questionnaire that recorded information, like name, age, gender and duration of haemorrhoids. Grade and duration of haemorrhoids were included and for outcome mean operative time and mean convalescence were part of the questionnaire.

In group A, all participants were operated upon in lithotomic position. A Chelsea-Eaton operating endoscope was used for the treatment of haemorrhoids. The internal and external components of each haemorrhoidal complex were grasped and elevated. By a third, Allis clamp counter traction was applied on the skin, vaguely lateral to the inter-sphincteric groove. The clamp-like electrode was positioned beneath the external component and was activated. The process was completely bloodless and a suture took minutes to complete the radically-closed haemorrhoidectomy. In group B, MM haemorrhoidectomy was performed with diathermy removal of the haemorrhoidal complexes. The duration of surgery was noted. Patients were followed-up in OPD every week. Patients of both groups were further followed-up during the convalescence period.

Data was analysed using SPSS 25. Mean, standard deviation (SD) and range were calculated for continuous variables. For qualitative variables, like gender, frequencies and

percentages were calculated. Independent sample t-test was used to compare the outcome in the groups. P≤0.05 was considered significant.

Results

Of the 60 patients, there were 30(50%) in group A; 17(56.7%) males and 13(43.3%) females with an overall mean age of 44.6±7.6 years. The remaining 30(50%) patients were in group B; 19(63.3%) males and 11(36.7%) females with an overall mean age of 43.8±8.2 years.

Patients of grades III and IV in each of the two groups were identified (Figure-1).

In both the groups, the patients were also stratified according to duration of their disease >6 months or <6 months (Figure-2).

In group A, mean operative time was 20.8±2.8 minutes, while it was 26.5±2.8 minutes in group B (*p*=0.001). In group A, mean convalescence period was 9.7±2.9 days, while it was 13.4±3.7 days in group B (*p*=0.001). Group A

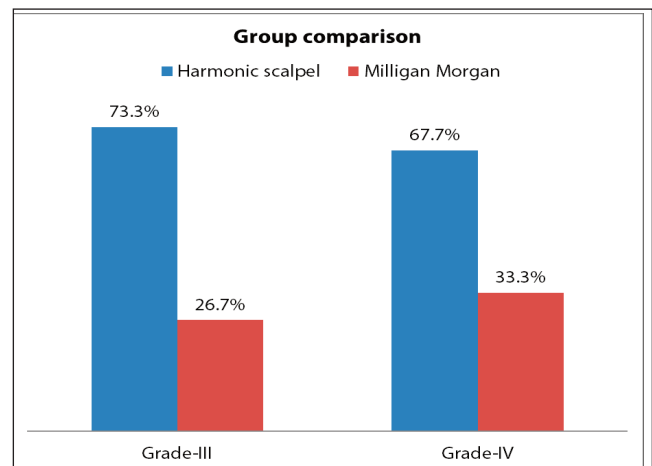


Figure-1: Percentages of haemorrhoids grading between the groups (n=60).

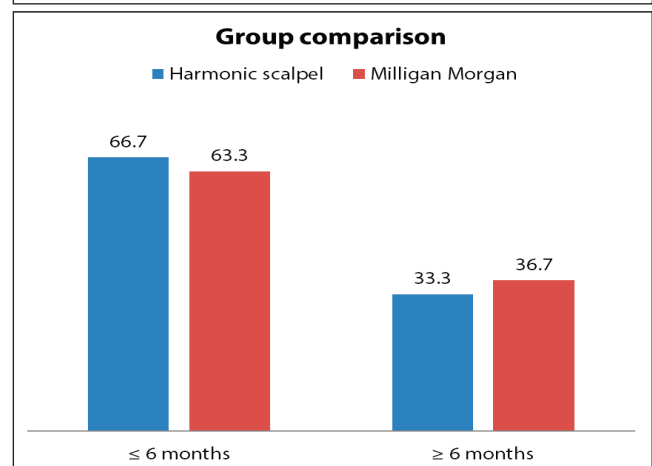


Figure-2: Percentages of period of haemorrhoids between the groups.

Table-1: Stratification of convalescence period between the groups with respect to the grade of haemorrhoids (n=60).

		Harmonic scalpel group Mean±SD	Milligan Morgan group Mean±SD	t*	p-value
Convalescence period (days)	Grade III	9.77±2.99	13.47±3.75	-4.226	0.0001
	Grade IV	10.50±3.46	13.40±3.66	-5.55	0.106

*: Independent t test. SD: Standard deviation.

Table-2: Stratification of operative time between the groups with respect to the duration of haemorrhoids.

		Harmonic scalpel group Mean±SD	Milligan Morgan group Mean±SD	t*	p-value
Operative time (minutes)	≤ 6 months	20.80±2.89	26.57±2.84	-7.795	0.0001
	≥ 6 months	21.60±3.10	27.27±3.29	-3.266	0.001

*: Independent t test. SD: Standard deviation.

required less time for complete wound healing compared to group B ($p < 0.05$). Data related to convalescence period between the groups was stratified with respect to haemorrhoid grade (Table-1), while data related to the operative time was stratified with respect to the duration of the disease (Table-2).

The operative time and convalescence period were significantly low for male patients compared to female patients in both the groups ($p < 0.05$).

Discussion

In the present study, mean operative time was 20.8±2.8 minutes with HS haemorrhoidectomy and it was 26.5±2.8 minutes with MM method ($p = 0.001$). The mean convalescence period was 9.7±2.9 days with HS and 13.4±3.7 days with MM ($p = 0.001$).

One randomised trial reported mean operating time of 11.09 minutes with HS and 38.76 minutes with MM ($p \leq 0.001$). The mean convalescence period with HS was 7.4 days compared to 18.6 days with MM ($p < 0.001$).¹⁷

However, the study warned that haemorrhoids must be treated cautiously, and there are numerous variables, like obstruction and delayed stressing during defecation, that may cause haemorrhoidal improvement.¹⁷

The vascular channel faces irregular dilatation and bending in the supporting connective tissues along with ruinous changes in the supporting connective tissue inside the butt-centric pad, and this is a significant finding related to the haemorrhoidal condition.^{18,19} Haemorrhoids are rich vascular sub-mucosal pads composed of flexible and smooth connective tissues that for the most part lie along the butt-centric channel in three sections; the left sidelong, right front and right-back positions. The blood vessels are

clinically evident draining from the perisinusoidal arterioles in nature.²⁰

Stomach pressure increases and so does the weight in the mediocre vena cava that makes these vascular pads engorged and forestall spillage. This tissue helps stool, fluid and gas in the butt-centric waterway.¹⁵ Treatment of haemorrhoids ranges from dietary and lifestyle amendments to radical dissection depending on the level and severity of the signs and symptoms.¹ One of the unique advantages of the HS method is to cause negligible lateral thermal injury in the tissues.²¹

A decrease in oblique thermal injury ($\leq 1.5\text{mm}$) at the surgical site means decreased postoperative pain. The depth of the thermal damage in porcine little entrails mesentery was observed through different procedures, such as with monopolar and bipolar electro-cautery.²²

HS achieved favourable postoperative pain scores compared to open or closed haemorrhoidectomy with scissors monopolar or bipolar electro-cautery in several prospective randomised studies which also reported less analgesic use and faster recovery with HS.^{23,24} The difference in pain was due to the avoidance of lateral thermal energy in HS compared to electro-cautery.

However, other studies, including the current study, found no significant difference in postoperative pain or other outcome variables between HS and conventional techniques.²⁵

The major limitation of the current study was the non-availability of HS at the study site, and had to prepare by a local manufacturer of surgical instruments. The device was costly compared to the conventional cautery, and may not be preferred by many patients.

Conclusion

HS haemorrhoidectomy was found to be an advantageous method in terms of operative time and convalescence period. Hence, it can be adopted as a safe and effective alternative method for treating symptomatic haemorrhoids.

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Conflict of Interest: None.

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