

A Comparative Study Between Milligan Morgan Hemorrhoidectomy Versus Hemorrhoidectomy with Harmonic Scalpel

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ABSTRACT

Background: The most common anorectal disease is Haemorrhoids. Ultrasonic coagulation is an evolving technique which uses the ultrasonic coagulation device to perform the classic Milligan and Morgan hemorrhoidectomy, which is arguably the most used surgical option in treatment of grade III and IV haemorrhoids. Objective- To compare the efficacy of harmonic scalpel hemorrhoidectomy and conventional hemorrhoidectomy. **Materials and Methods:** A prospective randomized study conducted in the year 2020-2021 on patients admitted in the department of surgery, Rajindra Hospital, Patiala which included 60 patients, which were divided randomly into two groups of 30 each, group A (undergone hemorrhoidectomy performed with classical Milligan-Morgan hemorrhoidectomy) and group B (undergone Harmonic scalpel hemorrhoidectomy). **Results:** The patients who underwent harmonic scalpel hemorrhoidectomy had statistically highly significant p value in post-operative pain, post-operative defecation and postoperative urine retention. **Conclusion:** Harmonic scalpel hemorrhoidectomy is preferred because of less postoperative pain at rest as well as on defecation and lesser postoperative urine retention.

Keywords: HSH- Harmonic scalpel hemorrhoidectomy, MMH -Milligan-Morgan hemorrhoidectomy.

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INTRODUCTION

The most common anorectal disease is Haemorrhoid.^[1,2] The peak period of onset of haemorrhoids is between 45-65 years of age.^[3] Hemorrhoids are defined as the symptomatic enlargement and distal displacement of the normal anal cushions. Million people around the world are affected, and representing a major medical and socioeconomic problem.^[1] The prevalence rate of hemorrhoids in adult population is 11%.^[4]

Surgery is reserved for grade three and four internal and external hemorrhoids, acute complicated hemorrhoids such as strangulation or thrombosis,^[6] or with concomitant anorectal conditions such as anal fissure or fistula-in-ano which require surgery.^[5] Surgical management options include Ferguson's (closed) hemorrhoidectomy, Milligan-Morgan (open) hemorrhoidectomy, Harmonic hemorrhoidectomy, Stapled hemorrhoidopexy, cryoablation, Ligation and Doppler guided hemorrhoidal artery ligation.^[7,8]

Ultrasonic coagulation is an evolving technique which uses the ultrasonic coagulation device to perform the classic Milligan and Morgan hemorrhoidectomy, which is the most used surgical option in treatment of grade III and IV hemorrhoids.^[9] For patients with grade 3 or 4 haemorrhoids, excisional hemorrhoidectomy is the standard treatment, with the lowest recurrence rates compared to other modalities.^[10] It can be done using scissors, diathermy,^[11,12] or vascular-sealing device such as Ligasure,^[13,14] and Harmonic scalpel.^[15,16] Milligan Morgan hemorrhoidectomy is considered as the gold standard.^[17] However, is associated with complications, such as postoperative bleeding, surgical-site anal pain, anal stenosis, and incontinence.^[18]

Harmonic Scalpel (HS) is a newly developed device introduced to surgery in last decade, which uses high frequency sound wave energy to cut and coagulate tissues at the same time, precisely at the point of application. It denatures protein by using ultrasonic vibration by transferring mechanical energy sufficient to break tertiary hydrogen bonds. The blade vibrates at the rate of 55.5 kHz over a distance of 80 µm. The active blade of the instrument vibrates longitudinally against the inactive blade over distance of 50 to 100 microns. One edge is relatively sharp for cutting and the other one is blunt for coagulation. There is localized coagulation with lateral tissue injury of upto 1.5 mm deep, while the depth of thermal injury is up to 15 mm by using monopolar diathermy.^[19]

The common postoperative complications are pain, per rectal bleeding, fecal incontinence and anal stricture.^[20,21]

The rationale for the use of Harmonic scalpel in hemorrhoidectomy is the relatively low temperature at which it divides the tissues by disrupting the protein hydrogen bonds through the high frequency ultrasonic energy. The relatively low temperature (80 °C) with less spread lead to less desiccation, less eschar formation, improved wound healing.^[22-27]

Harmonic Scalpel is found to be superior to the other methods in terms of postoperative pain and, consequently, patient satisfaction with the similar recovery time.^[28]

Aims and Objectives

To compare the efficacy of harmonic scalpel hemorrhoidectomy and conventional hemorrhoidectomy in terms of-

1. Operating time
2. First defecation after surgery
3. Post-operative complications

MATERIALS & METHODS

This was a prospective randomized study conducted from the year 2020-2021 on patients admitted in the department of surgery, Rajindra Hospital, Patiala. Sixty patients were included of age of 18 or more with Grade III and IV hemorrhoids, which were divided randomly into two groups, group A and group B-

Group A: comprising 30 patients who had undergone hemorrhoidectomy performed with classical Milligan-Morgan hemorrhoidectomy

Group B: comprising 30 patients who had undergone Harmonic scalpel hemorrhoidectomy.

Complete pre-anaesthetic checkup was done and patients were given bowel cleansing before surgery.

All the patients were assessed for:

- Operative duration
- First defecation after surgery
- Pain
- Pain during defecation

- Postoperative bleeding
- Urine incontinence
- Urine retention
- Sphincter spasm
- Fever
- Discharge per anus
- Wound condition
- Duration of hospital stay
- Anal stenosis
- Recurrence
- Fecal incontinence
- Any complications during the procedure



Figure 1: Instrument used for HSH: Harmonic scalpel



Figure 2: Dissection of the hemorrhoidal pedicle using Harmonic scalpel.

Postoperatively, ambulation was encouraged on the day of operation and warm sitz bath were ordered following each bowel movement.

Patients were asked to assess the pain using visual analog scale ranging from 0 to 10, with 0 signifying no pain and 10 as worst possible pain. A follow up was done at four weeks postoperatively to look for any anal stenosis, recurrence or fecal incontinence.

Operative technique: The operation was done under regional anaesthesia. In Group A - Milligan-Morgan hemorrhoidectomy was performed with electrocautery. Complete hemostasis was achieved. Wound was left open to heal secondarily.

Harmonic scalpel hemorrhoidectomy: The operation was performed with power of harmonic set at level 3 and cutting mode of the harmonic was used to give a V-shape cut on the perianal skin. Dissection was continued till the vascular pedicle which was identified and coagulation mode was used to slowly cut the pedicle.



Figure 3: Surgical wound site after HSH.

RESULTS

The pain score was calculated postoperatively using visual analog scale which was higher following MMH with a mean of 7.43 (SD 1.22) and was 5.27 (SD 1.20) following HSH, which is statistically highly significant (p value <0.001) signifying that HSH is a better procedure in terms of postoperative pain.

Table 1: Post-Operative Pain

Groups	Mean	S.D	Median	C.I	Range	P value	Significance
Group A	7.43	1.22	7.00	6.98 – 7.89	4.00 – 9.00	<0.001	HS
Group B	5.27	1.20	5.00	4.82 – 5.72	4.00 – 9.00		

Mann Whitney U Test

In group A, as assessed by VAS mean pain score was 5.83 (SD 1.18) with a median 6.0 and group B, 3.60 (SD 1.13) with a median 3.50, with a p value <0.001 that is statistically highly significant. Again, indicating the painless nature of the procedure done by HSH.

Table 2: Pain During Defecation

Groups	Mean	S.D	Median	C.I	Range	P value	Significance
Group A	5.83	1.18	6.00	5.39 – 6.27	4.00 - 9.00	<0.001	HS
Group B	3.60	1.13	3.50	3.18 – 4.02	2.00 - 6.00		

Mann Whitney U Test

In group A, 10 patients (33.3%) and only 2 patients (6.7%) in group B had urine retention, which is statistically highly significant (p value 0.021).

Table 3: Urine Retention

Urine Retention	Group A		Group B	
	Number	Percentage	Number	Percentage
Yes	10	33.3	2	6.7
No	20	66.7	28	93.3
Total	30	100.0	30	100.0
Fisher Exact Value	6.832			
P value	0.021			
Significance	S			

DISCUSSION

In excisional hemorrhoidectomy, tissue division can be accomplished by various means, including a scalpel, scissors, monopolar cauterization, and newer bipolar energy and ultrasonic devices. In Milligan-Morgan hemorrhoidectomy, the distal anoderm and external skin are left open for secondary healing. This technique can be a safe and effective means for treating advanced hemorrhoidal disease but can be a reason for considerable discomfort and prolonged morbidity postoperatively as the external wounds are left open for delayed healing. The main advantage of harmonic scalpel device is that hemostasis can be achieved without suture ligation.

There was no significant difference found in operative duration in group A and group B. It was <30 minutes for 26 (86.7%) patients in group A and for all the patients (100%) in group B (p 0.112).

In the present study, the mean VAS score for pain postoperatively was 7.43 (SD - 1.22) for group A (MMH) and 5.27 (SD- 1.20) for group B (HSH), which is statistically highly significant (.p value <0.001). [Table 1]

In the present study, the mean VAS score for pain during defecation was 5.83 (SD - 1.18) for group A (MMH) and 3.60 (SD- 1.13) for group B (HSH), which is statistically highly significant (.p value <0.001) [Table 2].

In our study, 1 patient (3.3%) in each group A (MMH) and B (HSH), had postoperative bleeding, which were managed conservatively by repacking the wound for 24 hours and administering single dose of 1gm of injection tranexamic acid.

Postoperative urine retention was seen in 10 patients (33.3%) in group A (MMH) and 2 patients (6.7%) in group B (HSH), which was found to be statistically significant (p 0.021). In the presence of regional anaesthesia patient is not sufficiently alert to have the desire to void postoperatively and also as postoperative pain was much less in group B as discussed before, the risk of urine retention requiring foley's catheterisation was significantly less in group B as compared to group A. [Table 3]

Sphincter spasm was seen in 6 patients (20%) in group A (MMH) and 4 patients (13.3%) in group B (HSH) in the present study, which is statistically nonsignificant. The patients, usually postoperatively might feel weak discomfort in the perianal area accompanied by mild

tenesmus especially for 1-2 days. In all the previous studies, no one has studied relation of sphincter spasm in both the groups (MMH vs HSH).

In our study, discharge per anus during postoperative period was seen in 4 patients (13.3%) in group A (MMH) and 3 patients (10%) in group B (HSH), which was statistically nonsignificant.

In our study, 5 patients (16.7%) in group A and 2 patients (6.7%) in group B postoperatively had wound infection which was not found to be statistically significant ($p = 0.424$). These patients were managed by intravenous antibiotics (mainly against gram negative rods and anaerobic bacteria).

In our study, duration of hospital stay of >2 days was seen in 7 patients (23.3%) in group A and 2 patients (6.7%) in group B which is statistically nonsignificant ($p = 0.145$).

Recurrence, anal stenosis and fecal incontinence. was not seen in any of the groups on follow up.

CONCLUSION

The cumulative data suggest that both the procedures are effective and safe for hemorrhoidectomy. But HSH is preferred because of less postoperative pain at rest as well as on defecation and lesser postoperative urine retention and provides a promising avenue for future research and may become gold standard in the near future.

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