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Comparative Study Of Management Of Grade Iii Hemorrhoids By Harmonic Scalpel Technique V/S Conventional Surgical Technique (Milligan Morgan Technique)

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ABSTRACT

Background: Hemorrhoids – a common condition – are felt by a mass of people and addressed using different methods. The following study aims to provide the assessment of the effectiveness, after-care outcomes and financial efficiency of two methods of treating Grade III hemorrhoids: The procedures analyzed in the present study were the HSH and MMH.

Methods: This is a prospective cohort review (analytical by nature), and 60 patients with Grade III hemorrhoids were included in it. The Harmonic Scalpel Hemorrhoidectomy was performed on 30 of the participates whereas the Milligan-Morgan Hemorrhoidectomy was performed on the remaining 30. Different patient outcomes such as pain, bleeding, anal incontinence, recurrent incidences and the cost involved were monitored as well as evaluated in a six month follow- up.

Results: Patients who underwent Harmonic Scalpel Hemorrhoidectomy reported much less pain, shorter processes, lesser needs for analgesics, and lower frequency of recurrence compared to those who received Milligan-Morgan Hemorrhoidectomy. However, the surgery by Harmonic Scalpel was quite expensive. Comparable rates of postoperative complications – especially the urinary incontinence, incontinence per rectum were found for both techniques, without marked statistical differences.

Conclusion: The Harmonic Scalpel can minimize pain, speed up recovery and reduce recurrence even if it comes with increased economic cost. The Milligan-Morgan procedure remains an affordable option for the surgical management of Grade III hemorrhoids.

Keywords: *Hemorrhoidectomy, Harmonic Scalpel, Milligan-Morgan, Grade III Hemorrhoids, Surgical Techniques, Postoperative Pain, Recurrence, Cost-Effectiveness.*

1. INTRODUCTION

Piles (hemorrhoids) represent a common anorectal disease which mostly affects people aged from 45 to 65 years, which makes them typical for clinical practice. Studies indicate that approximately 50% of the persons will suffer from hemorrhoidal symptoms throughout their lives [1]. There are grades of hemorrhoids which are categorized into 4, where Grade III has prolapsed hemorrhoids that need to be manually reduced. If management of Grade III or IV hemorrhoids proves resistant to conservative treatment, surgical intervention is frequently necessary [2].

Various surgical methods are used to manage hemorrhoids and they range from the classical versions such as the Milligan-Morgan to modern ones like the Harmonic Scalpel. One of the widely used treatments of hemorrhoids is the Milligan-Morgan hemorrhoidectomy (MMH) that removes the tissue and healing of wound occurs by open, dry granulation [3]. While effective in the long term, the Milligan-Morgan technique is too frequently accompanied by high postoperative pain, long recovery periods, and increased complications, such as bleeding and incontinence [4].

Contrarily, HSH uses a sophisticated ultrasonic energy device for surgery cuts and coagulations, which may have such advantages as reduced postoperative pains, faster healing, and minimal bleeding due to its hemostatic features [5]. However, the cost implications and relative efficacy of the procedure, as compared to traditional technique, continue to be debated in literature [6].

The present study was conducted to compare the outcomes of Grade III hemorrhoidectomy under the method of Harmonic Scalpel to that of the Milligan-Morgan procedure. Surgeons assessed outcomes, such as postoperative pain, postoperative hemorrhage, risk of recurrence, incontinence symptoms, surgical time, and costs. The aim of this research is to provide clinicians with necessary data to identify the best and most affordable treatment option for patients with Grade III hemorrhoids.

2. MATERIALS AND METHODS

Study Design: A potential cohort study was conducted at a tertiary facility over 12 months.

Study Participants: There were 60 patients with Grade III hemorrhoids that fully met the criteria for inclusion in the study and entered it. Participants were assigned to two randomly assigned groups: In the first group, thirty patients were handled using the Harmonic Scalpel technique (HSH), the other group had thirty patients who were managed using the Milligan-Morgan technique (MMH). Participants were eligible if aged between 18 and 65 years and had symptomatic Grade III hemorrhoids. Those with concurrent diseases of the rectum, a history of malignancy and patients who had undergone hemorrhoid surgery previously were not eligible to participate.

Surgical Technique:

- **Harmonic Scalpel Hemorrhoidectomy (HSH)**: The procedure involved using a Harmonic Scalpel device (Ethicon Endo-Surgery, USA) to excise the hemorrhoidal tissue. The device's ultrasonic energy was employed to cut and coagulate tissue simultaneously, minimizing blood loss and improving wound healing.
- **Milligan-Morgan Hemorrhoidectomy (MMH)**: Traditional excision of hemorrhoidal tissue was performed, followed by open wound healing.

Data Collection:

- Preoperative assessments included demographic data, comorbidities, and baseline symptomatology.
- Postoperative outcomes were recorded at regular intervals: immediately post-operation, and at 15 days, 1 month, 3 months, and 6 months post-surgery.
- Parameters assessed included pain scores (using the Visual Analog Scale), bleeding per rectum, postoperative complications, recurrence rates, operative time, analgesic requirement, and hospital stay.

Statistical Analysis All in all, unlike the classic Milligan-Morgan hemorrhoidectomy, the advantage of the Harmonic Scalpel technique in pain control, shortened recovery periods, and negligible recurrence, the use of the technique is significantly more expensive. Both procedures remain effective in treating Grade III hemorrhoids with the determination dependent on the patients' factors, the hospital environment and the available resources.

3. RESULTS

Demographic and Clinical Characteristics

The demographic characteristics of the study participants in both groups were similar. The mean age in the Harmonic Scalpel group was 48.27 years (SD = 9.857), and in the Milligan-Morgan group, it was 48.79 years (SD = 13.130), with no statistically significant difference ($p = 0.865$). The gender distribution showed that 73.3% of the Harmonic Scalpel group were male and 26.7% were female, compared to 80% male and 20% female in the Milligan-Morgan group.

In the Harmonic Scalpel group 83.3% of patients had painful defecation compared to 96.7 % in the Milligan-Morgan group. Of the patients who used the Harmonic scalpel technique, 76.7% reported rectal bleeding and 90% in those who embarked on Milligan-Morgan surgery. In the harmonic scalpel group, 53.3% and 70% in the Milligan-Morgan group were affected by constipation whereas pruritus affected 10% of the harmonic scalpel group and 13.3% of the Milligan-Morgan group. The differences were not significant ($p > 0.05$), as statistical analysis showed.

Postoperative Outcomes

- **Pain Scores**: The Harmonic Scalpel group demonstrated significantly lower pain scores across all postoperative intervals. At 15 days post-operation, the median pain score in the Milligan-Morgan group was 6, compared to 2 in the Harmonic Scalpel group. This trend continued with lower pain scores in the Harmonic Scalpel group at all follow-up points. At 1 month, the median pain score in the Harmonic Scalpel group remained at 1, compared to 2 in the Milligan-Morgan group. At 3 and 6 months, pain scores continued to favor the Harmonic Scalpel group, showing minimal pain in both groups, but the Harmonic Scalpel group continued to report slightly lower pain scores.
- **Bleeding Per Rectum**: The incidence of bleeding per rectum was significantly lower in the Harmonic Scalpel group at 15 days and 1 month post-operation, with p-values of <0.0001 and <0.05, respectively. However, at 3 and 6 months, no significant difference was observed between the two groups in terms of bleeding per rectum.
- **Incontinence**: The incidence of incontinence was low in both groups, with 4.54% in the Milligan-Morgan group and 4.76% in the Harmonic Scalpel group. There was no statistically significant difference in the incidence of incontinence between the two groups.

Intraoperative Factors

- **Operative Time**: Surgery time differed significantly between either group with a statistical difference. For operations conducted using the Harmonic Scalpel, 66.7% operations were performed in 30 minutes, a low difference when compared to 3% recorded in the Milligan-Morgan group. The decrease of operative time in the Harmonic Scalpel group was highly statistically significant ($p < 0.0001$).
- **Analgesic Requirement**: The need for postoperative analgesics was significantly higher in the Milligan-Morgan group. A total of 66.7% of patients in the Milligan-Morgan group required higher doses of analgesics compared to only 26.7% in the Harmonic Scalpel group. This difference was statistically significant with a p-value of < 0.005.

Recurrence and Cost

- **Recurrence**: The recurrence rate was higher in the Milligan-Morgan group compared to the Harmonic Scalpel group, but this difference was not statistically significant ($p > 0.05$). Both techniques demonstrated generally low recurrence rates, suggesting effective long-term outcomes.
- **Cost Comparison**: The cost of the Harmonic Scalpel procedure was significantly higher than that of the Milligan-Morgan procedure. The mean cost for the Harmonic Scalpel group was Rs 1050 (SD = 201.08), while for the Milligan-Morgan group, it was Rs 500 (SD = 137.59), with a p-value of <0.0001, indicating a statistically significant difference.

Postoperative Recovery

•**Duration of Hospital Stay**: The Harmonic Scalpel group had a slightly lower hospital stay, 1.76 days, compared to Milligan-Morgan group, with an average value of 2.04 days. This difference did not reach a significant level, $p > 0.05$.

•**Absence from Work**: On average, employees of the Milligan-Morgan group lost 8.24 days (standard deviation is 3.23) of work, which was greatly above the Harmonic Scalpel group. This difference was statistically significant, $p < 0.0001$; patients in the Harmonic Scalpel group recovered faster from the procedure.

There was no significant difference in terms of postoperative complication such as pruritus, sphincter spasm and sentinel pile formation between the two groups.

TABLE 1: BASELINE CHARACTERISTICS OF STUDY PARTICIPANTS

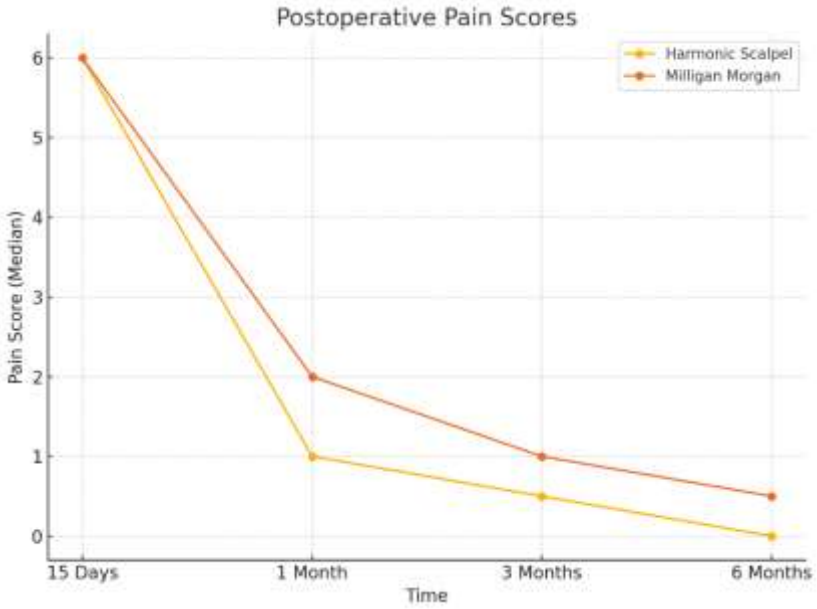
Parameter	Harmonic Scalpel Technique n=30 (%)	Milligan Morgan Technique n=30 (%)	p-value
Age (Mean (SD))	48.27 (9.857)	48.79 (13.130)	0.865
Male	22 (73.3)	24 (80)	-
Female	8 (26.7)	6 (20)	-
Painful Defecation	25 (83.3)	29 (96.7)	> 0.05
Bleeding Per Rectum	23 (76.7)	27 (90)	> 0.05
Constipation	16 (53.3)	21 (70)	> 0.05
Pruritus	3 (10)	4 (13.3)	> 0.05

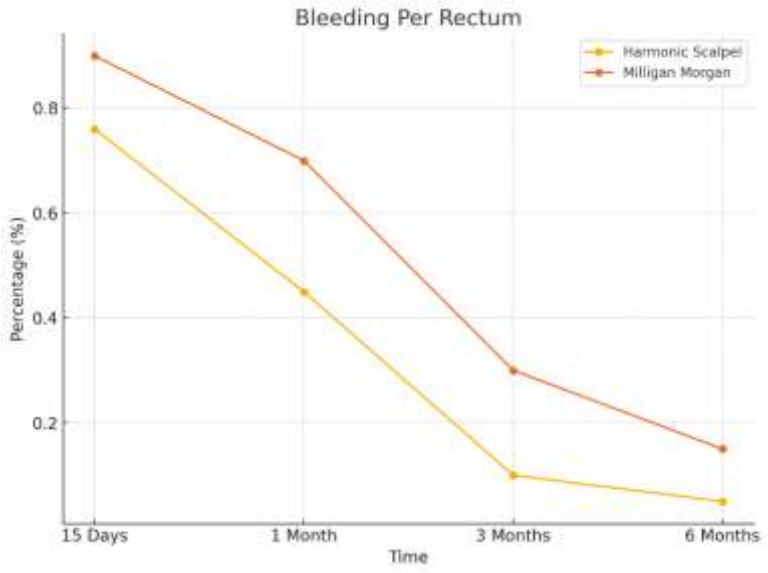
TABLE 2: OPERATIVE TIME DISTRIBUTION

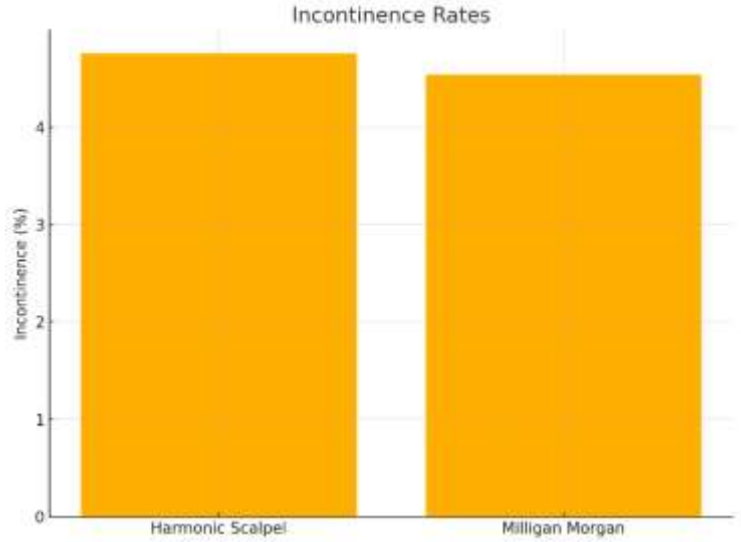
Time Duration	Harmonic Scalpel n=30 (%)	Milligan Morgan n=30 (%)	p-value
<30 minutes	20 (66.7)	1 (3%)	<0.0001
30-60 minutes	10 (33.3)	21 (70%)	<0.0001
>60 minutes	0 (0%)	8 (26.7%)	<0.0001

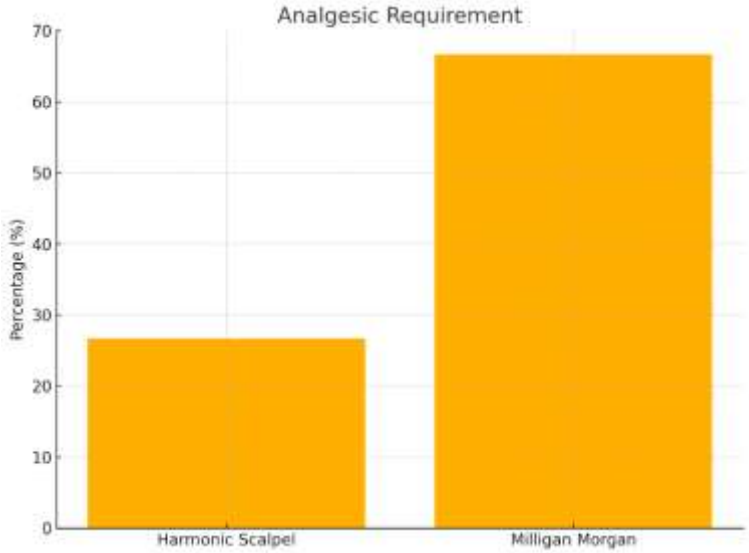
TABLE 3: COMPARISON OF SURGICAL COST

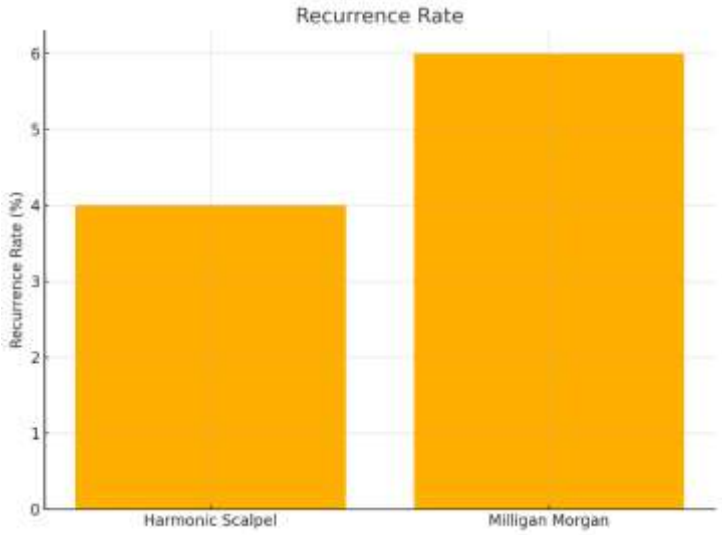
Technique	Mean Cost (Rs)	Standard Deviation (Rs)	p-value
Harmonic Scalpel	1050	201.08	<0.0001
Milligan Morgan	500	137.59	<0.0001

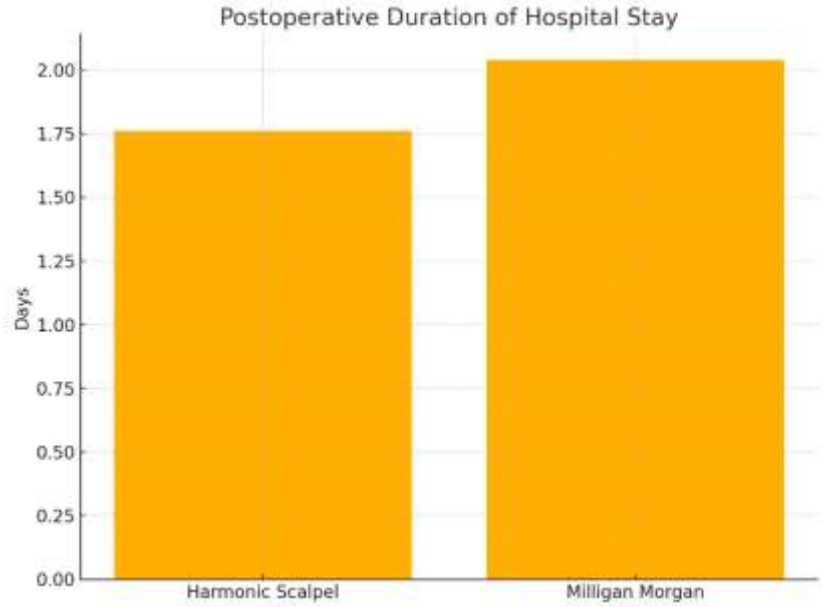





Incontinence Rates
Incontinence (%)
0
1
2
3
4
Harmonic Scalpel
Milligan Morgan


Analgesic Requirement
Percentage (%)
0
10
20
30
40
50
60
70
Harmonic Scalpel
Milligan Morgan


Recurrence Rate
Recurrence Rate (%)
0
1
2
3
4
5
6
Harmonic Scalpel
Milligan Morgan



4. DISCUSSION

The research gives detailed information about efficacy and outcomes after operation of Harmonic scalpel versus Milligan-Morgan hemorrhoidectomy in Grade III hemorrhoids. Although the two procedures produced comparable rates of postoperative complications, the Harmonic Scaalpel technique had obvious advantages in terms of less pain, faster operating times, and lower analgesic usage. The ability of the Harmonic Scalpel to prevent bleeding during and after surgery might explain the reduced pain and superior healing that was noted [7][8].

The aspect of financial implications takes an important role in decision-making towards selecting which technique. The increased cost implication of the Harmonic Scalpel device represents a significant obstacle for healthcare systems, especially in resource-constrained areas. Despite the superior outcomes of the Harmonic Scalpel group, Milligan-Morgan technique is still regarded as cost-effective, with no differences toward the long term [9].

Also, the low rate of recurrence in both groups is consistent with other reports, where both methods achieve long lasting resolution of Grade III hemorrhoids [10][11]. Incontinence, a major concern in hemorrhoid practice, is equally common in the two groups involved in this research, thus indicating both methods to be equally safe.

5. CONCLUSION

In conclusion, while the Harmonic Scalpel technique offers superior outcomes in terms of pain relief, recovery time, and recurrence rates, it comes with a higher cost compared to the traditional Milligan-Morgan hemorrhoidectomy. Both techniques remain viable options for the surgical management of Grade III hemorrhoids, with the choice largely dependent on individual patient needs, healthcare settings, and available resources.

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