



Original Article


## A Comparative Study on Outcome of Open (Milligan-Morgan) Haemorrhoidectomy and Harmonic Scalpel Haemorrhoidectomy in Management of Grade Iii/Iv Haemorrhoids

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### ABSTRACT

#### Introduction

Haemorrhoids are one of the most common benign anorectal diseases that plagues the human population across the globe. According to some studies at least 50 % of adults over the age of 50 have some degree of haemorrhoids. Although the treatment of first and second degree haemorrhoids is usually conservative, third and fourth degree haemorrhoids are treated with surgical management. Hemorrhoidectomy is the most definitive way of treating 3rd and 4th degree hemorrhoids.

#### Method

Pre-anaesthetic evaluation of all patients was performed by an anaesthesiologist a day before the surgery. After taking written informed consent, patients were allocated randomly using software generated random number table SPSS Version 21 into two

#### Conclusion

Hence, it can be concluded that Harmonic scalpel hemorrhoidectomy is a safe and effective procedure in grade 3 & 4 haemorrhoids and can be safely considered an alternative to open haemorrhoidectomy, long considered the -gold standard.

**Keywords:** Harmonic Scalpel Hemorrhoidectomy, Open Hemorrhoidectomy, Grade III & IV Hemorrhoids, Surgical Outcomes, Postoperative Pain.

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### INTRODUCTION

Haemorrhoids are one of the most common benign anorectal diseases that plagues the human population across the globe. According to some studies at least 50 % of adults over the age of 50 have some degree of haemorrhoids. Although the treatment of first and second degree haemorrhoids is usually conservative, third and fourth degree haemorrhoids are treated with surgical management. Hemorrhoidectomy is the most definitive way of treating 3rd and 4th degree hemorrhoids. Open (Milligan-Morgan) haemorrhoidectomy was first introduced in 1937 and continues to be used widely by surgeons all over the world. Even though the technique is cost effective and has a short learning curve it suffers from a bad name due to being a painful procedure for a fairly benign condition causing postoperative pain needing about 2-3 days hospital stay with a convalescence of at least one month. (1) Two well-established methods are the Milligan-Morgan excision and the Ferguson techniques. Various techniques have been previously described and Milligan-Morgan operation has stood the challenge of time and is the basis for evolution of different operations. (2,4) Pain, per rectal bleeding, pain during defecation, constipation are the commonest post-operative complications. (2,3)

The main causes for postoperative pain are related to the incision performed during the surgery, the sutures applied to anal mucosa, cauterization, and possible surgical site infection. (4) The harmonic scalpel is an ultrasonically activated instrument with sound waves as its source of power, which vibrates at a rate of 55,000 per second. It is known for its ability to coagulate small and medium-sized vessels thus, potentially it may minimize postoperative swelling and edema to the surrounding tissue. (5) The Harmonic Scalpel possesses the unique advantage of causing very little lateral thermal injury in the tissues. A decreased lateral thermal injury (<1.5 mm) at the surgical site is translated into decreased postoperative pain. In contrast to traditional monopolar diathermy, which can only cut tissue with minimal coagulation, these devices can cut and coagulate tissue and vasculature (6) A study in 2017 compares outcomes

between hemorrhoidectomy performed with harmonic scalpel and conventional methods and concluded that harmonic appears to be safe and better procedure for symptomatic grade 3/4 hemorrhoids with ease of operating due to less bleeding, less postoperative pain, and patient acceptance. (7)

## **AIM AND OBJECTIVES**

### **AIM**

To analyse efficacy among open haemorrhoidectomy and harmonic scalpel haemorrhoidectomy in management of grade III/IV haemorrhoids based on immediate (24HRS) and early post operative complications. (within one week)

### **OBJECTIVES**

#### **PRIMARY OBJECTIVE**

- To study and compare the proportion of patients suffering from various post operative complications (including post operative pain, pain during defecation and post operative bleeding ) after open haemorrhoidectomy vs. harmonic scalpel haemorrhoidectomy.

#### **SECONDARY OBJECTIVE**

To study and compare the mean number of days of hospital stay in cases of open haemorrhoidectomy and harmonic scalpel haemorrhoidectomy in management of grade 3/4 haemorrhoids. (average duration of hospital stay in Grade 3 and 4 haemorrhoids is 2-5 post operative day).

## **MATERIAL AND METHODS**

### **STUDY SITE**

The present study was conducted in the Department of General Surgery at MathuraDas Mathur Hospitals, attached to Dr. Sampurnanand Medical College, Jodhpur, Rajasthan

**STUDY DESIGN:** Prospective observational study

### **STUDY POPULATION**

**INCLUSION CRITERIA:** Patient who had underwent surgery (Milligan- Morgan hemorrhoidectomy and harmonic scalpel hemorrhoidectomy) for grade 3/grade 4 haemorrhoids.

### **EXCLUSION CRITERIA:**

- Patients who were deemed unfit during PAC.
- Patients with uncorrected coagulopathies (pt-inr > 1.5, platelet counts < 1 lakh/mm<sup>3</sup>).

**STUDY PERIOD:** Starting from approval by ethical committee till the completion of number of cases (70 subjects).

### **METHOD**

Pre-anaesthetic evaluation of all patients was performed by an anaesthesiologist a day before the surgery. After taking written informed consent, patients were allocated randomly using software generated random number table SPSS Version 21 into two

#### **GROUP 1 and GROUP 2.**

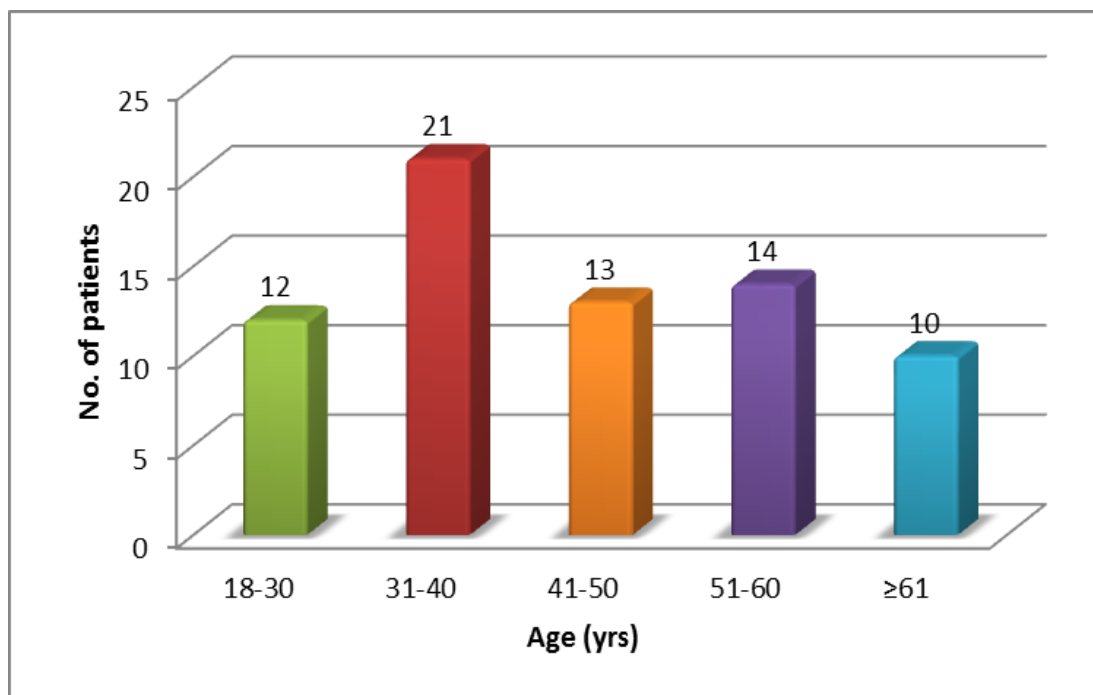
Patient was positioned in lithotomy position in both groups.

**GROUP 1:** Under SA, Patient in lithotomy position, a proctoscope is inserted and, when slowly withdrawn, allows the haemorrhoids to prolapse. An artery forceps is applied to the skin element of each haemorrhoid and a second forceps applied to it prolapsing mucosa. These artery forceps hold the haemorrhoid for dissection, but can also be used to retract the others out of the operative field if an anal retractor is not employed. It is often easier to mark all the incisions in the anal canal, to ensure adequate skin and mucosal bridges between the excisions, before proceeding with the removal of the first haemorrhoid. A fine diathermy point is ideal for this, and incises the anoderm and mucosa with minimal bleeding. Excision of the first haemorrhoid is then commenced by a V-shaped incision through the skin at the base of the external component. The V-incision is extended across the anal verge to join the preliminary superficial marking incisions and defines the tissue to be excised. The dissection is deepened under the V to develop the plane outside the haemorrhoidal tissue, but great care must be exercised to ensure that this dissection is inside the internal sphincter. The muscle fibres should be clearly visualized and preserved. The haemorrhoidal tissue is dissected off the underlying internal sphincter up into the anal canal until its pedicle of mucosa, and the feeding vessels of the plexus only attach it. A transfixion suture is then placed through the pedicle and the haemorrhoid excised. Anal packing is done.

**GROUP 2:** Under SA, Patient in lithotomy position, an anoscope is inserted and, when slowly withdrawn, allows the haemorrhoids to prolapse. A small incision is made in the mucosa above the hemorrhoidal tissue. The harmonic scalpel is used to dissect and remove the hemorrhoidal tissue. As the harmonic scalpel cuts, it seals blood vessels, which helps in achieving hemostasis. Hemostasis achieved. Anal packing done.

**TABLE 1: Patient distribution on basis of age group, Gender, Religion and Surgical Management**

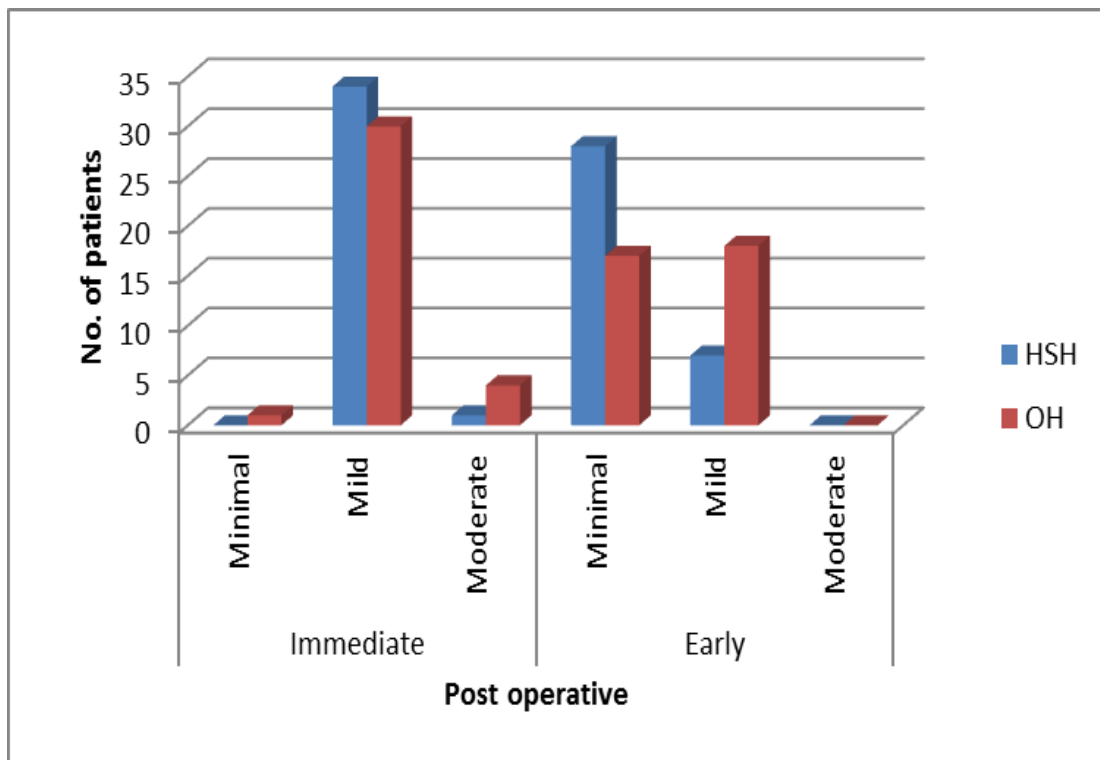
Demographic		No. of patients	Percentage
Age (yrs)	18-30	12	17.14
	31-40	21	30.00
	41-50	13	18.57
	51-60	14	20.00
	≥61	10	14.29
Gender	Male	55	78.57
	Female	15	21.43
Religion	Hindu	61	87.14
	Muslim	9	12.86
Surgical management	HSH	35	50.00
	OH	35	50.00



**TABLE 9: Incidence of post-operative bleeding in immediate and early operative period**

Post-operative bleeding (Verbal pain rating scale)		Total no. of patients	HSH		OH		P value
			N	%	N	%	
Immediate	Minimal	1	0	0.00	1	2.86	0.217
	Mild	64	34	97.14	30	85.71	
	Moderate	5	1	2.86	4	11.43	
Early	Minimal	45	28	80.00	17	48.57	0.006 (S)
	Mild	25	7	20.00	18	51.43	
	Moderate	0	0	0.00	0	0.00	

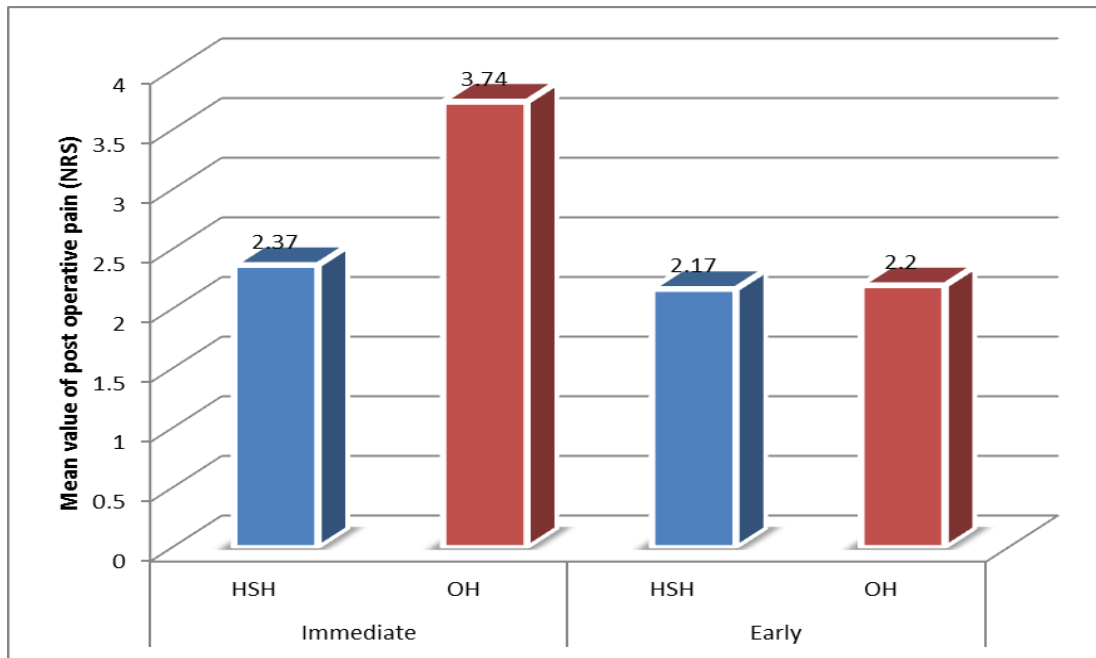
Chi square test



**TABLE 10: Incidence of post-operative pain in immediate and early operative period**

		Post-operative pain (Numerical pain rating scale)			P value
		Mean	SD	Median	
Immediate	HSH	2.37	1.39	2	0.003 (S)
	OH	3.74	1.93	4	
Early	HSH	2.17	0.78	2	0.868
	OH	2.2	1.1	2	

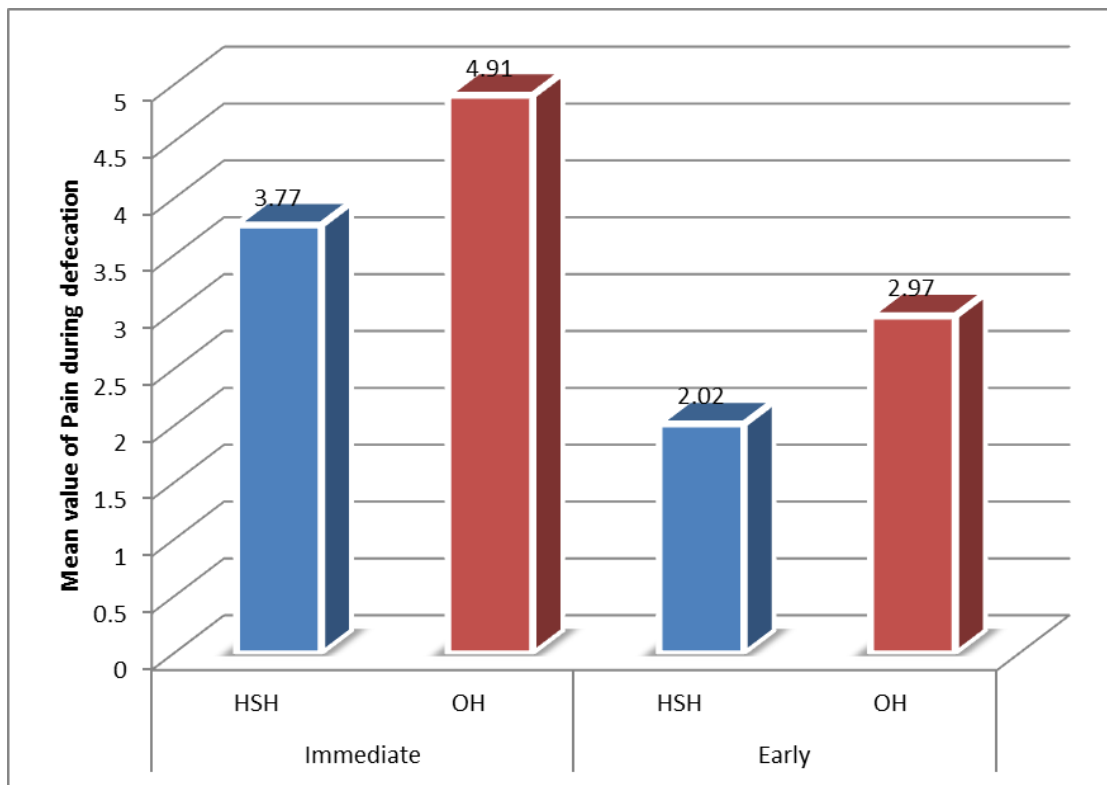
Mann whitney u test



**TABLE 11: Incidence of pain during defecation in immediate and early operative period**

		Pain during defecation			P value
		Mean	SD	Median	
Immediate	HSH	3.77	1.64	4	0.014 (S)
	OH	4.91	1.42	5	
Early	HSH	2.02	0.95	2	0.010 (S)
	OH	2.97	1.54	3	

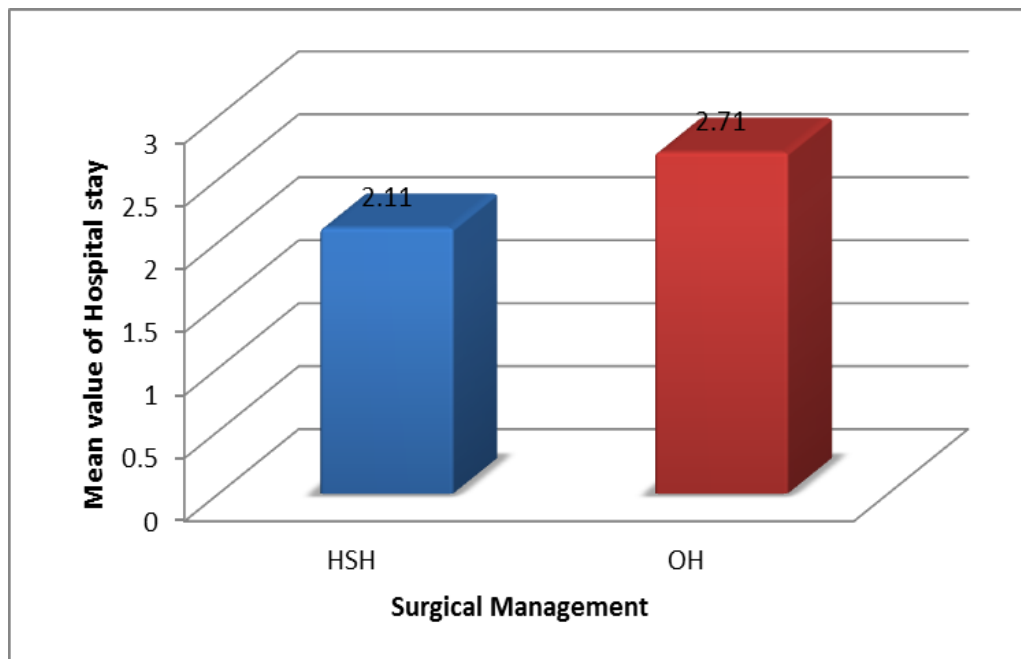
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**TABLE 13: Duration of hospital stay after surgery**

Surgical management	Hospital stay			P value
	Mean	SD	Median	
HSH	2.11	0.32	2	0.002 (S)
OH	2.71	0.82	3	

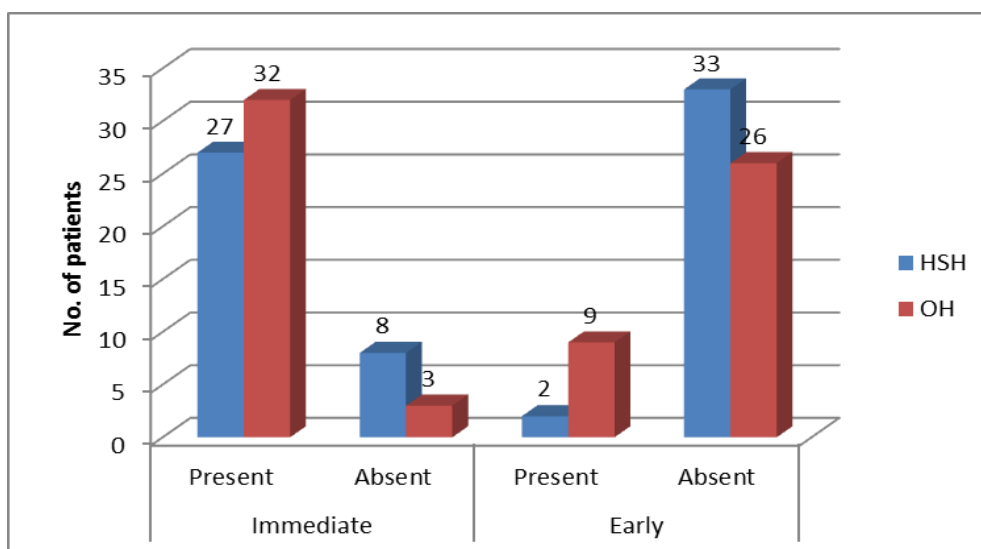
Mann whitney u test



**TABLE 14: Incidence of constipation in immediate and early post operative period**

Constipation		Total no. of patients	HSH		OH		P value
			N	%	N	%	
Immediate	Present	59	27	77.14	32	91.43	0.100
	Absent	11	8	22.86	3	8.57	
Early	Present	11	2	5.71	9	25.71	0.021 (S)
	Absent	59	33	94.29	26	74.29	

Chi square test



**DISCUSSION**

Internal haemorrhoids of grades III or IV are usually treated surgically. After a haemorrhoidectomy, pain and discomfort are still a major problem. Various devices, such as harmonic, have been enhanced to prevent intraoperative and postoperative haemorrhage, bleeding, anal incontinence, and anal stenosis Harmonic scalpels are ultrasonic scalpels with

automatic vessel-sealing mechanisms that have recently been upgraded. Tissue charring and full cutting and coagulation of vessels up to 7 mm in diameter with minimal heat spread less than 2 mm.

### **Hemorrhoidectomy is the most effective and definitive treatment for symptomatic hemorrhoids.**

Traditional hemorrhoidectomy techniques, including a Milligan–Morgan open hemorrhoidectomy and a Ferguson closed hemorrhoidectomy, are known to be very effective and appropriate treatment for grade III and IV hemorrhoids. However, the traditional surgical methods are accompanied by complications such as postoperative pain, bleeding and constipation. The harmonic scalpel is an ultrasonically activated instrument with sound waves as its source of power, which vibrates at a rate of 55,000 times per second. It is known for its ability to coagulate small and medium-sized vessels; thus potentially it may minimize postoperative swelling and edema to the surrounding tissue. The harmonic scalpel possesses the unique advantage of causing very little lateral thermal injury: <1.5 mm at the surgical site is translated into decreased postoperative pain.

Pain following Milligan–Morgan procedure can be explained by positioning the ligature onto the vascular root of the hemorrhoid, while electrocautery and laser procedures cause significant heat damage to the sensitive perihemorrhoid area. Reduction of this heat is considered to be the main reason for decreasing the level of pain after harmonic scalpel hemorrhoidectomy. This study clearly demonstrates the superior pain control profile of harmonic scalpel in hemorrhoidectomy and less need for analgesics.

Numerous controlled studies have already demonstrated that this technique is associated with less postoperative pain and a quicker recovery. Right from the earliest study, there is a high patient satisfaction rate. However, most of these studies were conducted in highly specialized centers.

The present study was designed to compare the immediate and early post operative results of HSH with Milligan-Morgan Haemorrhoidectomy. Our goals were to find out if the results of the HSH are the same as those reported in the literature when the operation is performed at independent centres.

### **DISTRIBUTION ON THE BASIS OF POST OPERATIVE COMPLICATIONS IN IMMEDIATE AND EARLY PERIOD POST OPERATIVE BLEEDING**

In immediate period only 1 patient from OH group (2.86%) presented with minimal bleeding. 64 patients had mild bleeding among which 34 patients (97.14%) were among HSH group and 30 patients (85.71%) were among OH group.

Total 5 patients presented with moderate bleeding among which 1 patient (2.8%) was among HSH group and 4 patients (11.4%) were among OH group.

In early period total 45 patients presented with minimal bleeding among which 28 patients (80%) were among HSH group and 17 patients (48.5) were among OH group. 25 patients presented with mild bleeding among which 7 patients (20%) were among HSH group and 18 patients (51.43%) were among OH group.

### **None of the patient had moderate bleeding in early period.**

The p-value of post-operative bleeding in early phase came out to be 0.006 (significant). Hence HSH group had low incidence of post-operative bleeding in early period.

### **DISTRIBUTION OF PATIENTS ON THE BASIS OF POST OPERATIVE PAIN**

In the immediate period mean score for pain (based on NPRS) was 2.37 in HSH group and 3.74 in OH group. P-value came out to be 0.003 (significant). Hence HSH group had lower incidence of post-operative pain in immediate period.

In the early period mean score of pain was 2.17 among the HSH group and 2.2 among the OH group. Harmonicscalpel haemorrhoidectomy was reported to be applied in the clinic by Jane [8] and other investigators in 2001, and research has shown that harmonic scalpel haemorrhoidectomy can reduce the pain and post operative bleeding of patients.

Mushaya [9] et al. conducted a meta-analysis of the comparison between harmonichaemorrhoidectomy and traditional haemorrhoidectomy, and the results showed that the ultrasonic scalpel group had lower pain scores, a lower complication rate, and a faster recovery than the traditional surgery group. Research by Ravi Kumar [10] et al. showed that compared with the Milligan-Morgan operation, ultrasonic haemorrhoidectomy resulted in less blood loss (19.4 and 6.1 ml, respectively). Compared with the Milligan-Morgan method group, the ultrasonic scalpel group had lower VAS pain scores on the first day and the first and the second week after the operation.

**Hence HSH group patients had lower incidence of pain during defecation in immediate and early period.**

## DISTRIBUTION OF PATIENTS ON THE BASIS OF HOSPITAL STAY

Among the HSH group the mean score for the duration of hospital stay was 2.11 and among the OH group mean score for the duration of hospital stay was 2.71.

p-value came out to be 0.002 (significant). Hence HSH group was associated with less duration of hospital stay.

A study conducted by alhomoud H, Mohsen et-al, 25 patients were put in HSH group and 25 were in OH group. Mean duration of hospital stay was 1+/-0.1 in HSH group and 2.5+/-0.6 in OH group. (11)

## DISTRIBUTION OF PATIENTS ON THE BASIS OF PAIN DURING DEFECATION

In the immediate period mean score of pain was 3.77 among the HSH group and 4.91 among the OH group. p-value came out to be 0.014 (significant).

In the early period mean score of the pain was 2.02 among the HSH group and 2.97 among the OH group. p-value came out to be 0.010 (significant).

## DISTRIBUTION OF PATIENTS ON THE BASIS OF CONSTIPATION IN POST OPERATIVE PERIOD

In the immediate period total 59 patients presented with complaint of constipation among which 27 patients (45.76%) were among HSH group and 32 patients (54.24%) were among OH group.

In the early period total 11 patients presented with complaint of constipation among which 2 patients (18.18%) were among HSH group and 9 patients (81.82%) were among OH group.

p-value came out to be 0.021 (significant). Hence HSH group of patients were associated with less incidence of constipation in early post-operative period.

A comparative study was conducted by Thyagarajan A, Bhatnagar S among HSH and OH for management of grade 3/4 haemorrhoids. 30 cases were distributed in each group. (12) 29 patients among OH group experienced painful defecation in post-operative period among while 25 patients among HSH group experienced painful defecation in postoperative period. 21 patients among OH group experienced constipation in post-operative period while 16 patients among HSH experienced constipation in post-operative period.

## SUMMARY

- A total of 70 patients were studied in this study. The patients were divided into 2 groups of 35 patients. Group one underwent open haemorrhoidectomy while group 2 underwent HSH.
- The incidence of Grade 3 and 4 haemorrhoids is 3.6 times more in men as compared to women.
- The mean age of patients who underwent Open haemorrhoidectomy was 43.17 years old while mean age for patients who underwent HSH was 44.08 years.
- Bleeding per rectum and prolapse of haemorrhoids were the most common presenting complaints. Constipation was next most common. Pain was the least common presenting complaint.
- In the study population 18.5% of patients smoke and 12.8% patients having history of chronic alcohol consumption.
- Grade 3 haemorrhoids were 2.88 times more common than grade 4.
- The common complication suffered by the patients was post-operative bleeding and post-operative pain. All complications were more common in the open haemorrhoidectomy group as compared to HSH group.
- Patients who underwent Open Haemorrhoidectomy had to stay in the hospital longer than the other group who underwent HSH.

## CONCLUSION

Hence, it can be concluded that Harmonic scalpel hemorrhoidectomy is a safe and effective procedure in grade 3 & 4 haemorrhoids and can be safely considered an alternative to open haemorrhoidectomy, long considered the -gold standard.

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