International Surgery Journal
Kumar RGV et al. Int Surg J. 2017 Jun;4(6):2010-2013
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20172402

Original Research Article

Harmonic scalpel compared with conventional open (Milligan-Morgan) method in surgical management of symptomatic haemorrhoids

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Received: 06 April 2017
Accepted: 02 May 2017

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ABSTRACT

Background: There have been many attempts to find less painful surgical methods for treating haemorrhoids. Harmonic scalpel is a device that simultaneously cuts and coagulates soft tissues through ultrasonic vibrations. The aim of this study was to compare the results of Harmonic scalpel hemorrhoidectomy with conventional Milligan Morgan hemorrhoidectomy for the treatment of grade III and IV hemorrhoids.
Methods: Patients with grade III or IV hemorrhoids, operated between January 2016 and December 2016, using the harmonic scalpel (n=30) or the conventional open technique (n=30) were studied. Both the groups were compared with respect to Operative time, Blood loss during surgery, early postoperative complications, postoperative pain measured on a visual analog scale (VAS), hospital stay, and return to normal work.
Results: Harmonic scalpel and conventional open haemorrhoidectomy patients differ significantly in terms of VAS score of postoperative pain, blood loss during surgery, early post-operative complications, return to normal work. However, there is no significant difference in terms of duration of surgery and hospital stay in both the groups.
Conclusions: Harmonic scalpel haemorrhoidectomy has been found advantageous method when assessing the amount of bleeding intraoperatively, post-operative pain, early postoperative complications, and Return to normal work. Hence Harmonic scalpel haemorrhoidectomy can be adapted as a safe and effective alternate method for treating symptomatic haemorrhoids.

Keywords: Harmonic scalpel, Haemorrhoids, Haemorrhoidectomy

INTRODUCTION

Hemorrhoid disease is the symptomatic enlargement and protrusion of normal anal cushions.[1] It is a common surgical condition occurring in 4.4% of adults with a peak prevalence between 45 and 65 years of age, according to epidemiological study conducted in the USA.[2]

Surgical removal of hemorrhoids is the gold standard treatment for symptomatic grade III and IV hemorrhoid disease. The most significant complication of hemorrhoid surgery is postoperative pain.[3] The reasons for postoperative pain are related to the incisions made during surgery, suturing the anal mucosa, use of cautery, and possible surgical site infection.[4] In conventional methods of haemorrhoidectomy, hemorrhoidal tissue is removed using scalpel and electrocautery and pedicle is ligated, and the defect is either left open (Milligan-Morgan's open haemorrhoidectomy) or sutured (Hill Ferguson's closed haemorrhoidectomy).

Harmonic scalpel is an energy source which uses ultrasonic vibrations at 55.5 KHz, which simultaneously cuts and coagulates up to 2mm of blood vessels.[5]

Advantages of harmonic scalpel in surgery are reduced operative bleeding and effective hemostasis resulting in shorter operative time and less tissue damage than high energy cautery devices such as diathermy or laser because of less lateral thermal injury. Hence haemorrhoidectomy performed with harmonic scalpel is proposed as a faster and less painful alternative to conventional techniques.

Surgery

Surgical preparations were similar in both the groups. No preoperative prophylactic antibiotic was given. All patients received sodium bisphosphate enema before surgery.

Anesthesia was either general or spinal according to surgeon, anesthesiologist and patient preferences. Patients were placed in lithotomy position for surgery. In Milligan-Morgan technique, V shaped incision is made at anoderm, internal sphincter is separated off the hemorrhoid tissue till its origin above the dentate line, haemorrhoidal plexus were removed using scalpel and pedicle was ligated with 2/0 vicryl suture, and the wound was left open.

In harmonic scalpel haemorrhoidectomy, hemorrhoid tissue were removed using the harmonic scalpel up to its pedicle (Ethicon Endo-Surgery) and the wounds were left open. Anal pack was placed in both the techniques. For postoperative analgesia, opioids (tramadol 1 ml tid) were given. At the time of discharge, patients were prescribed with oral analgesics.

METHODS

This is a prospective study where 60 patients of symptomatic grade III and IV hemorrhoids who underwent haemorrhoidectomy between January 2016 and December 2016 were evaluated. Harmonic scalpel haemorrhoidectomy (n=30) and Milligan-Morgan technique haemorrhoidectomy (n=30) were compared with respect to operative time, Intra operative bleeding, postoperative pain, early postoperative complications, length of hospital stay, and time to return to normal activity.

Exclusion criteria were thrombosed or strangulated haemorrhoids, concomitant perianal disease, history of recurrent perianal surgeries, known tendencies for bleeding and patients unfit for surgery and anesthesia. One fully soaked gauze is considered 5ml of blood intra operatively.

All patients had same kind of analgesia during the postoperative course that is opioid injection (tramadol 1ml tid). Postoperative pain was assessed using visual analogue scale, from 0 to 10. And follow up is scheduled on first, second and third week post operatively.

RESULTS

Conventional open haemorrhoidectomy was done in 13 males and 17 females (mean age, 42 years) while harmonic scalpel haemorrhoidectomy was done in 16 males and 14 females (mean age, 45 years). There was no significant difference between patients subjected to conventional open or harmonic scalpel haemorrhoidectomy in terms of age, gender, duration of symptom or hemorrhoid grade (Table 1).

Table 1: Comparison of general factors between the 2 groups.

	Harmonic scalpel method (n=30)	Milligan-Morgan method (n=30)
Male/Female	16/14	13/17
Age in years (range)	45 (27-60)	42 (30-58)
Duration of symptoms		
<6 months	9	11
>6 months	21	19
Hemorrhoid grade		
Grade III	18	20
Grade IV	12	10
Type of anesthesia		
Spinal	28	27
General	2	3

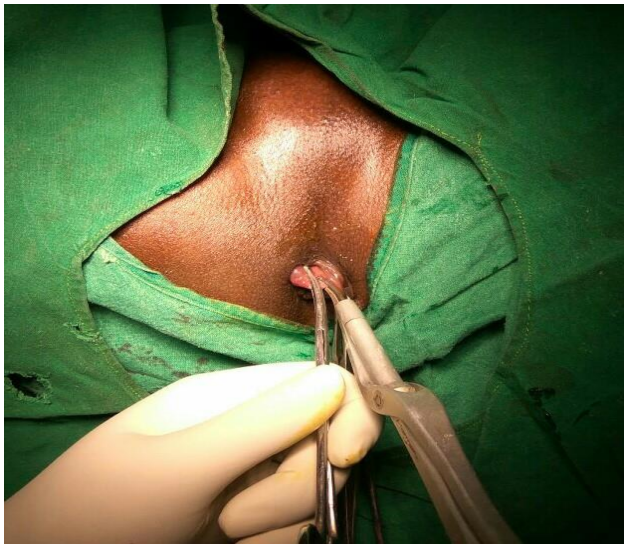

Figure 1: Intra operative photo of harmonic scalpel hemorrhoidectomy.

Intra operative blood loss was significantly less in Harmonic scalpel Haemorrhoidectomy than in Milligan-Morgan method (6.1 ml and 19.4 ml respectively, $p<0.05$). Early postoperative complications like bleeding and urinary retention were less in Harmonic scalpel haemorrhoidectomy (1{33.3%}, 1{33.3%}) compared to Milligan-Morgan method (3{10%}, 5{16.6%}).

According to VAS score, pain in the harmonic scalpel haemorrhoidectomy group was significantly less than that in Milligan-Morgan technique group. Return to normal activity was early in patients operated by Harmonic scalpel method than Milligan-Morgan method (6.2 Days versus 11.3 Days with P-value <0.05). However Operative time and Hospital stay did not differ significantly between both the groups (Table 2).

Table 2: Comparison of results of both the groups.

	Harmonic scalpel method (n=30)	Milligan-Morgan method (n=30)	P value
Operative time (min)	19.2±2.1	19.9±1.6	0.152
Blood loss (ml)	6.1±1.7	19.4±5.4	<0.05
Postoperative complications			
Bleeding	1 (33.3%)	3 (10%)	
Urinary retention	1 (33.3%)	5 (16.6%)	
Postoperative pain (VAS score)			
Day 1	3.2±0.6	6.4±0.9	<0.05
Week 1	1.9±0.4	5.4±0.7	<0.05
Week 2	1.2±0.4	3.9±0.6	<0.05
Hospital stay	1.5±0.5	1.6±0.5	0.442
Return to work	6.2±1.1	11.3±1.9	<0.05

DISCUSSION

Surgical haemorrhoidectomy is considered to be more effective and definitive treatment for symptomatic hemorrhoids. Most common complication post operatively is pain, which results due to surgical defect in perianal skin and anoderm. To overcome this problem different treatment modalities have been developed such as rubber band ligation, sclerotherapy, photocoagulation and cryotherapy. However, surgical treatment remains the most effective and definitive treatment for grade III and IV hemorrhoids.[6] Multiple factors have been proposed to be the etiologies of haemorrhoidal development including constipation and prolonged straining during defecation. The abnormal dilatation and the distortion of vascular channel, together with destructive changes in the supporting connective tissue within the anal cushion is an important finding of haemorrhoidal disease.[7]

The harmonic scalpel possesses the unique advantage of causing very little lateral thermal injury in the tissues. Decreased lateral thermal injury of 0.5 to 1.5mm at the surgical site is translated into decreased post-operative pain. Many authors found that the pain in the harmonic scalpel haemorrhoidectomy group was significantly less than that in patients treated by electrocautery, and this difference was also recognizable in analgesic usage.[8] In present study post-operative pain scores were highest in day 1 in both groups. In comparison with Milligan-Morgan method, Harmonic scalpel haemorrhoidectomy had less blood loss (19.4 versus 6.1 ml respectively). The VAS pain scores at day 1, week 1 and week 2 were lesser in harmonic scalpel compared to Milligan-Morgan method. Post-operative complications such as hemorrhage and urinary retention were more in Milligan-Morgan group.

CONCLUSION

Harmonic scalpel haemorrhoidectomy has been found advantageous method when assessing the amount of blood loss during surgery, post-operative pain, early postoperative complications, and early return to normal work compared to conventional open (Milligan-Morgan) method. Hence, Harmonic scalpel haemorrhoidectomy can be considered as safe and effective alternate method in treating symptomatic haemorrhoids.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Kumar RGV, Madhu BS, Tanga V, Reddy NKM, Pawar PM Harmonic scalpel compared with conventional open (Milligan-Morgan) method in surgical management of symptomatic haemorrhoids. Int Surg J 2017;4:2010-3.