

ORIGINAL ARTICLE

A Prospective Randomised Study of Comparing Diathermy and Ultrasonic Scalpel Haemorrhoidectomy

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ABSTRACT

BACKGROUND: Haemorrhoidectomy is the most effective approach for haemorrhoidal disease especially for grade III and grade IV disease. However, postoperative pain is a major concern, and the surgery itself is with complications including notably bleeding, wound sepsis, pain, and anal stenosis. **MATERIALS AND METHODS:** The study was carried out from 1st July 2014 to 30th Sep 2016 and 50 cases of 3rd and 4th degree haemorrhoids were selected with complaints of bleeding per rectum, pain during defecation and discharge. The patients were explained about their disease and modalities of treatment as ultrasonic scalpel or diathermy haemorrhoidectomy with advantages and disadvantages of each. Analysis was made on basis of percentages and mean. Randomly selected 25 patients were operated by ultrasonic scalpel & another 25 patients by diathermy haemorrhoidectomy under spinal anaesthesia. **RESULTS:** Ultrasonic scalpel haemorrhoidectomy take about 20 to 35 minutes while diathermy haemorrhoidectomy take about 30 to 45 minutes. The VAS pain scores on postoperative Day 1, 3, and 7 of the Ultrasonic Scalpel group were 5.8, 4.2 and 3.8 respectively and of the Diathermy haemorrhoidectomy group were 7.0, 6.2 and 4.2 respectively. Post-op bleeding in form of soakage of per-anal dressing was seen in only 4% cases in ultrasonic group while 12% cases in diathermy group. **CONCLUSION:** Ultrasonic scalpel haemorrhoidectomy is preferred for surgical treatment of grade III and grade IV haemorrhoids. It is safe and effective, and causes less intra-operative blood loss, less post-operative pain and less complications compared to diathermy haemorrhoidectomy.

Keywords: Diathermy, ultrasonic scalpel, haemorrhoidectomy

INTRODUCTION

The prevalence of symptomatic haemorrhoidal disease in the population aged >40 years is approximately 58%. This is a common disease that usually needs surgery for treatment. Although conservative treatment is often sufficient for early stages (Grade I and Grade II), late stage disease (Grade III and Grade IV) usually needs surgical treatment. Haemorrhoidectomy can cause complications including pain, postoperative bleeding, urinary retention, anal stenosis, and anal incontinence.¹ The Ultrasonic scalpel instrument is an

Alternative technique for haemorrhoidectomy that has been developed recently.² Ultrasonic scalpel is a device that simultaneously cuts and coagulates tissues by producing a vibration of 55.5 kHz. When compared with conventional electrosurgical devices, this ultrasonic cutting and coagulating device has advantages such as causing minimal lateral tissue injury (causes lateral thermal injury 1–3 mm wide, approximately half that caused by diathermy), less fumes, not making neuromuscular stimulation, and more localized impact.^[2, 3] We used the Ultrasonic scalpel for haemorrhoidectomy in Grade III and Grade IV haemorrhoids and compared our results with those for Diathermy.

MATERIALS AND METHODS

Enrolled into the study were 50 patients who were operated for symptomatic Grade III and Grade IV haemorrhoids in P.D.U. Medical College Rajkot, General Surgery Department between July 2014 to Sept

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2016. Patients were randomized into Diathermy and Ultrasonic scalpel groups. Patients with liver cirrhosis, HIV infection, uncontrolled diabetes, or a bleeding diathesis were excluded from the study. Patients on anticoagulant medication or aspirin were told to stop their medication 7 days prior to surgery. The present review focused on comparing Ultrasonic scalpel versus Diathermy haemorrhoidectomy with regards to operating time, postoperative pain, postoperative analgesics requirement, length of hospital stay, time to return to normal activity, and postoperative complications. Pain, bleeding, anal stenosis, urinary retention, and abscess were assessed as postoperative complications. Patients enrolled in the study were hospitalized on the day before operation and enema was given twice (night and morning) prior to the operation. Patients without complications after the operation were discharged from hospital 1 day after the surgery. Spinal anaesthesia was the chosen anaesthetic procedure for all patients. Patients were placed in the lithotomy position. After dilatation of anal canal, situation of haemorrhoids was determined with a proctoscope. Patients in the study had all three primary haemorrhoids and all three were excised by either ultrasonic scalpel or diathermy. Diathermy haemorrhoidectomy was defined as cutting the anal mucosa with diathermy & transfixation of haemorrhoid pedicle and apposition of mucosal edges of the defect with 3/0 chromic catgut suture. Ultrasonic Scalpel haemorrhoidectomy was defined as cutting the anal mucosa with ultrasonic scalpel & excision of haemorrhoid pedicle to the apex region without damaging the internal sphincter with the help of vascular forceps. Anal packs were placed for both patient groups to control bleeding. Total analgesic needs of the patients were recorded after 1 day, 3 days, and 7 days. Pain was recorded on a visual analogue scale (VAS). Operation time is defined as the time between the incision and suturing of the skin. Patients were assessed for complications when they came back for follow up. Chi-square test were performed

for comparison of the groups as appropriate. A *p* value <0.05 was considered as statistically significant.

RESULTS

The mean age of patients who underwent Harmonic scalpel and Diathermy haemorrhoidectomy was 45 ± 13 years and 52.5 ± 11.3 years respectively. The male/female ratio of the Ultrasonic Scalpel and Diathermy haemorrhoidectomy groups was 20/5 and 21/4 respectively. The average postoperative stay in the Ultrasonic Scalpel group was less than the Diathermy haemorrhoidectomy group. The time of return to normal activity was shorter for the Diathermy haemorrhoidectomy group.

Table: Outcomes comparing Ultrasonic harmonic and Diathermy Haemorrhoidectomy

	Ultrasonic Scalpel	Diathermy
Age	45 ± 13	52.5 ± 11.3
Time to start normal activity(wk)	1-2	2-3
Operation time (min)	20 -35	30-45
Post-op pain 1 st POD	24 (96%)	25 (100%)
Post-op pain 3 rd POD	06 (24%)	15 (60%)
Post-op pain 7 th POD	01 (4%)	09 (36%)
Postoperative bleeding	1 (4%)	3 (12%)
Urinary retention	1 (4%)	2 (8%)
Anal abscess	-	-
Anal stenosis	-	-
Anal incontinence	-	-
Recurrence after 3 months	-	-
VAS 1 st POD	5.8	7.0
VAS 3 rd POD	4.2	6.2
VAS 7 th POD	3.8	4.8
Analgesic requirement at POD 1	20 (80%)	22 (88%)
Analgesic requirement at POD 3	04 (16%)	15 (60%)
Analgesic requirement at POD 7	00	5 (20%)

The average operating time of the Ultrasonic Scalpel and Diathermy haemorrhoidectomy groups was 20-35 minutes and 30-45 minutes respectively. There was no significant difference between Ultrasonic Scalpel and Diathermy haemorrhoidectomy groups in the terms of the number of excised haemorrhoid. The VAS pain scores on postoperative Day 1, Day 3, and Day 7 of the Ultrasonic Scalpel group were 5.8, 4.2, 3.8 respectively, and of the Diathermy haemorrhoidectomy group were 7.0, 6.2, and 4.2 respectively. Number of patients with requirement analgesia on postoperative Day 1, Day 3, and Day 7 were 20, 4, 0 respectively for Ultrasonic scalpel and 22, 15, 5

respectively for Diathermy haemorrhoidectomy group.

In the early postoperative period (within 7 days of surgery), the Ultrasonic Scalpel group had lower incidence of acute urinary retention after surgery than the Diathermy haemorrhoidectomy group (4% vs 8%). The incidence of major postoperative haemorrhage was lower in Ultrasonic scalpel group than Diathermy group (4% vs 12%). No abscesses, stenosis, or incontinence were seen in both the groups on follow up.

DISCUSSION

Ultrasonic Scalpel, which can be used for cutting and coagulation simultaneously, does not transfer the neuromuscular current and makes minimal (1–3 mm) lateral thermal effect, which is why the instrument is used widely.¹ Due to minimal lateral thermal effect and minimal injury to nerve, it causes less postoperative pain. After ultrasonic cutting and coagulation, this technique gives a signal that allows surgeon to finish the process more quickly. Furthermore, it causes minimal intraoperative bleeding, which allows the surgeon better exposure, so surgery lasts less time than with other techniques, and causes minimal mucosal damage, leading to faster wound healing, less postoperative morbidity, and minimal pain.¹ Diathermy haemorrhoidectomy has the disadvantage of damaging the surrounding mucosa and transferring the current. Furthermore it does not achieve sufficient vascular coagulation, leading to longer operation time and inadequate exposure. The surgeon has to suture deeply in the mucosa to stop the bleeding, causing postoperative pain and anal stenosis. In comparison with Diathermy, Ultrasonic Scalpel haemorrhoidectomy has shorter operating time (20-35 minutes vs. 30-45 minutes). Postoperative complications, such as bleeding (4% vs. 12%) and urinary retention (4% vs 8%) were lower in the Ultrasonic Scalpel group. The postoperative hospital stay was also lower in the Ultrasonic Scalpel group compared with Diathermy haemorrhoidectomy. Previous study has demonstrated that the incidence of residual haemorrhoids of

Ultrasonic Scalpel and Diathermy haemorrhoidectomy were 3.5% and 5%, respectively.^{4, 5, 6} In our study, abscess, stenosis, and incontinence were not recorded in both the groups. On follow-up, there was no significant difference in terms of recurrence between Ultrasonic Scalpel and Diathermy haemorrhoidectomy. As stated in previous randomized studies, postoperative pain is felt at the highest level in the first 24 hours and decreases later.⁸ The VAS pain scores at Day 1, Day 3, and Day 7 were lower in Ultrasonic Scalpel group than Diathermy haemorrhoidectomy group because Ultrasonic Scalpel can be used for cutting and coagulation simultaneously. According to these data, analgesic need was the highest in first 24 hours and then decreased gradually, and was lower in Ultrasonic Scalpel group than Diathermy haemorrhoidectomy group at postoperative Day 1, Day 3, and Day 7.^{7, 8} As reported previously, postoperative morbidity delays the wound healing period and return to work. The period for returning to work for patients who received Diathermy haemorrhoidectomy was approximately 2–3 weeks. Mean time of return to normal activity was shorter for the Ultrasonic Scalpel groups than for the groups.⁹

CONCLUSION

Ultrasonic Scalpel haemorrhoidectomy is preferred for surgical treatment of Grade III or Grade IV haemorrhoids. It is safe and effective, and causes less blood loss, postoperative pain, and complications compared to Diathermy haemorrhoidectomy.

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