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## A Comparison between the Outcome of LigaSure Hemorrhoidectomy Versus Conventional Milligan Morgan's Technique

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### ABSTRACT

**Background:** Hemorrhoidectomy using the traditional method for 3rd and 4th grade piles is a time-consuming procedure that is vulnerable to many postoperative complications.

**Aim of the work:** to evaluate the consequences of Ligasure hemorrhoidectomy in comparison with a traditional hemorrhoidectomy.

**Patients and methods:** The current study was achieved between January 2018 to January 2020. A total of fifty patients with 3rd or 4th degree piles were separated into 2 groups. Group A contained 25 cases who were subjected to Ligasure Hemorrhoidectomy and Group B contained 25 cases who were subjected to hemorrhoidectomy by Milligan Morgan's technique. Procedure time, the volume of lost blood, postoperative pain, duration of hospitalization, and post-procedure complications were recorded.

**Results:** Out of 50 patients, there were 32 males and 18 females. The mean age of all patients for group A was 43 years, and for group B, was 47 years. The average procedure time in both groups was 12.5±3 min and 23.3±5.2 min respectively. The average amount of lost blood was 14.50 ml and 25.17 ml in both groups, respectively. The VAS pain scores on the 1st day and 7th day in group A were 4.1, and 1.2 respectively and in group B were 6.8, and 2.1 respectively. The duration of hospitalization was 1.4 days and, 3.2 days in both groups, respectively.

**Conclusion:** Hemorrhoidectomy using LigaSure is a safe and effective procedure with minimal tissue trauma due to the minimal spread of thermal energy, and there is no need to use sutures.

**Keywords:** Hemorrhoids; Ligasure Hemorrhoidectomy; Conventional Hemorrhoidectomy.

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### INTRODUCTION

Anorectal piles are characterized by distal displacement or expansion of the anal cushion<sup>1-3</sup>. Various publications have reported the main pathological finding as abnormal degenerative changes and dilated vascular channels of the anal cushion<sup>4-5</sup>. The prevalence of piles is estimated at 5%, in the general population<sup>6</sup>. According to Goligher's classification, piles can be classified in four degrees according to the degree of prolapse and appearance of piles<sup>7</sup>. In the 1<sup>st</sup> degree piles, there is only anal without any protrusion of anal cushions. In the 2<sup>nd</sup> degree piles, there is a protrusion of anal cushions outside on straining with spontaneous reduction. In the 3<sup>rd</sup> degree piles, there is a protrusion of anal cushions outside on straining but need to be reduced manually. In the 4<sup>th</sup> degree piles, there is a permanent, irreducible protrusion of anal cushions outside through the anus. Most of the complications occur in the 4th degree and include incarceration internal piles, thrombosis, inflammation, and mucosal prolapse<sup>8</sup>. The appropriate surgical modality depends on the degree of piles, the patient's age, and the complications<sup>9-11</sup>. Hemorrhoidectomy is the chief technique for the

treatment of 3<sup>rd</sup> and 4<sup>th</sup> grades piles<sup>12</sup>. Milligan Morgan technique is the most frequently practiced open surgical procedure using a combination of electrocautery and suture ligation of the pile pedicle. This technique may be complicated by postoperative pain, hemorrhage, and wound infection<sup>13</sup>. Many surgeons advocate that vascular pedicle ligation itself may raise the chance of secondary hemorrhage as it may result in ischemia and necrosis<sup>9-13</sup>. Ligasure vessel sealing system is a bipolar electrothermal device that uses a calculated arrangement of pressure and radiofrequency to seal blood vessels. By using Ligasure, there is no need to suture the vascular pedicle and avoid its drawbacks. The goal of this study is to compare traditional Milligan-Morgan hemorrhoidectomy versus ligasure hemorrhoidectomy in the treatment of individuals with 3<sup>rd</sup> and 4<sup>th</sup> degree piles<sup>13</sup>.

### PATIENTS AND METHODS

The current study was achieved from January 2018 to January 2020. A total of 50 Patients suffering symptomatic hemorrhoids of 3<sup>rd</sup> and 4<sup>th</sup> degrees were involved.

After randomization, the cases were subsequently separated into 2 comparable groups after a thorough explanation of either technique. Group A: 25 patients were scheduled for LigaSure Hemorrhoidectomy. Group B: 25 patients were scheduled for hemorrhoidectomy by Milligan Morgan's technique. All patients provided written consent and accepted to participate in our study.

**Inclusion criteria:**

All patients who presented with symptomatic hemorrhoids of 3<sup>rd</sup> and 4<sup>th</sup> degrees in all age groups and both sexes were involved in this study.

**Exclusion criteria:**

Patients with acute episodes of thrombosed hemorrhoids, co-existing anal diseases, inflammatory bowel diseases, patients with previous anal surgery, anticoagulant therapy, immunosuppressed patients were excluded from the study.

**Methods:**

Preoperative prophylactic antibiotic (cefazolin 1g IV) was given to all patients in addition to preoperative rectal enema.

**Operative Technique**

**Group A: LigaSure hemorrhoidectomy**

After digital anal dilatation and examination, the pile mass is grasped by Allis clamp distally and artery forceps proximally (Fig.1). The ligasure apparatus (Fig.2) was used to divide the hemorrhoidal cushion starting from mucocutaneous junction to the hemorrhoidal pedicle, with preservation of the anal sphincters till the pedicle of hemorrhoid appears (Fig.3). The pile pedicle can be sealed twice to ensure good hemostasis and reduced postoperative bleeding (Fig.4). A similar procedure was done for 2nd and 3rd hemorrhoids with skin bridges between them. The anal pack was used if needed.



**Fig. 1:** Pile was grasped by Allis clamp distally and artery forceps.



**Fig. 2:** LigaSure device handle.



**Fig. 3:** Dissection of the pile mass.



**Fig. 4:** Sealing of the pile pedicle.

**Group B: Conventional (Milligan-Morgan) hemorrhoidectomy**

Digital anal dilatation and anal examination were done to evaluate the piles' position and to exclude other anal pathology. The hemorrhoidal cushion is grasped by Allis clamp distally and artery forceps proximally, then a V-shaped incision is made in the mucocutaneous skin junction, and hemorrhoids are dissected using electrocautery (Fig.5) and its pedicle transected and ligated using Vicryl 2-0 (Fig.6). The steps were repeated to other hemorrhoids, and the wound was left open with a raw surface. The anal pack was inserted using one gauze rolled inside Sofra-Tulle gauze.



**Fig. 5:** Dissected using electrocautery.



**Fig. 6:** Pedicle was transfixed and ligated using Vicryl 2-0.

#### Assessment

The duration of surgery was noted from the beginning of skin preparation to the placement of the pack after surgery completion. Per-operative

bleeding was noted by counting the sum of gauze pieces (4\*4). Each blood-soaked gauze accounted for 5 ml of lost blood. Post-operative pain was evaluated using a visual analogue scale (VAS) provided to the patient and they were asked to grade the severity of pain on 0–10. Early postoperative complications like secondary hemorrhage, urinary retention, and wound infection were recorded.

**Follow Up:** Examination was conducted at 1 month, 3 months, and 6 months after complete wound healing. Late postoperative complications such as recurrence and anal stenosis had not been recorded.

#### Statistical Analysis

The statistics were represented as a mean and standard error. Data analysis was performed by one-way analysis of variance (ANOVA).

## RESULTS

Out of fifty cases, in group A there were 14 males and 11 females, while in group B there were 18 males and 7 females. The mean age of all patients for group A was 43 years (range 22–63 years), and for group B was 47 years (range 27–64 years). (Table 1).

	Group A		Group B	
	<i>N</i>	%	<i>n</i>	%
<b>Gender</b>				
<b>Male</b>	14	56%	18	72%
<b>Female</b>	11	44%	7	28%
<b>Age</b>				
<b>Range</b>	22–63		27–64	
<b>Mean ± SD</b>	43.13±14.34		47.21±13.32	

**Table 1:** Showing Preoperative data in the study groups (gender and age).

The average procedure time in group A and B was 12.5±3 min and 23.3±5.2 min respectively (P-value <0.001). The VAS pain scores on the 1<sup>st</sup> day and 7<sup>th</sup> day in group A were 4.1±0.8, and 1.2±0.2 respectively, and in group B were 6.8±1.8, and 2.1±0.7 respectively (<0.001). The average postoperative stay in group A was 1.4 days, and in group B was 3.2 days. (Table 2.)

	Group A	Group B	p-value
<b>Operative time (min)</b>	12.5 ± 3	23.3 ± 5.2	< 0.001
<b>Pain scores 1st day</b>	4.1 ± 0.8	6.8 ± 1.8	--
<b>Pain scores 1st week</b>	1.2.3 ± 02	2.1 ± 09	--
<b>Hospitalization period (days)</b>	1.4 ± 02	3.2 ± 05	--

**Table 2:** The results of each technique.

The average volume of blood loss was 14.50±6.66 ml with Ligasure and 25.17±2.52 ml with conventional hemorrhoidectomy (<0.001).

	Group A		Group B	
	<i>N</i>	%	<i>N</i>	%
<b>5 – 10 ml</b>	5	20	0	0.0
<b>11 – 20 ml</b>	15	60	7	28
<b>21 – 30 ml</b>	5	20	18	72
<b>Total</b>	25	100	25	100
<b>Mean+/- SD</b>	14.50±6.66		25.17±2.52	

**Table 3:** Average of blood lost during operation.

In group A, one developed urinary retention, and in group B one patient had a secondary hemorrhage, two patients developed urinary retention during the postoperative period. None of our patients developed delayed complications such as recurrence, anal incontinence, or anal stenosis.

	Group A		Group B		P vale
	<i>N</i>	%	<i>N</i>	%	
<b>Bleeding</b>	0.0	0.0	1.0	4	0.001
<b>Urinary retention</b>	1.0	4	2.0	8	0.01
<b>Anal stenosis</b>	0.0	0.0	0.0		--

**Table 4:** Postoperative complications.



## DISCUSSION

Hemorrhoidectomy is the gold standard technique and the most definitive treatment for hemorrhoids<sup>14</sup>. Ligasure hemorrhoidectomy has many advantages such as less procedure time, decreased amount of lost blood, fewer pain scores after the procedure, lower frequency of urinary retention, decreased hospitalization period, and quicker convalescence compared to traditional hemorrhoidectomy<sup>13,15</sup>. Mastakov et al.<sup>16</sup> in their study which depended on 11 trials of 1046 cases reported that the ligasure hemorrhoidectomy was a more effective technique than conventional procedure, with a very low occurrence of postoperative complications. The current study appeared that ligasure hemorrhoidectomy has a shorter procedure time, and less pain score compared with the Milligan-Morgan procedure. The goal of hemorrhoidectomy surgery is to eliminate the dilated tortuous veins, sealing of hemorrhoidal arteries, and obliteration of the submucosal space. However, the major drawbacks of the procedure are postoperative pain, early retention of urine is common (2 - 36%), postoperative hemorrhage (early or delayed) which may require re-exploration (0.03 - 6%), other septic complications (0 - 5%), anal stenosis (0 - 6%) are reported complications in the literature<sup>17,18</sup>. In the current study, Ligasure hemorrhoidectomy had a reduced procedure time and less intra-operative blood loss. These results were parallel to a study performed by Palazzo et al<sup>19</sup>. In the current study, the VAS pain scores were lesser in Ligasure on the 1<sup>st</sup> postoperative and after 1 week. These results were similar to Muzi et al.<sup>20</sup>, and Bessa et al.,<sup>21</sup> in their studies.

## CONCLUSION

Ligasure hemorrhoidectomy is a safe and very effective method compared to the conventional Milligan-Morgan technique, as it has less operative time, less intraoperative bleeding, less postoperative pain, and earlier wound healing with a shorter convalescence period. These advantages seem to make hemorrhoidectomy surgery a day-care procedure.

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