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Comparison of Conventional Ferguson's Haemorrhoidectomy with Ligasure Haemorrhoidectomy focusing on complications and hospital stay: Single Institutional Study

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ABSTRACT

Background: Ligasure haemorrhoidectomy and Ferguson's haemorrhoidectomy are two popular surgical techniques used to manage haemorrhoids, especially grade III and IV cases. Based on available studies, Ligasure Haemorrhoidectomy uses a vessel-sealing system to coagulate the pedicle of the haemorrhoid instead of conventional ligation and cutting. The advantage of the less operating time, compared to conventional Ferguson's method, where trans fixation and excision need more time. Additional advantages include less postoperative pain, blood loss, and shorter hospital stay.

Objective: To compare Conventional Ferguson's Haemorrhoidectomy with Ligasure Haemorrhoidectomy, focusing on complications and hospital stay

Methods: Prospective single-blinded randomised control study, conducted in the Department of Surgery, with 50 consecutive patients presenting with grade III and IV haemorrhoids. Purposive sampling, taken from the study frame of haemorrhoid patients for a period of one year from January 2024 to December 2024. Patients were divided by simple computer randomisation into 2 groups for two different techniques. One group of 25 patients consented to Ligasure haemorrhoidectomy, and 25 patients opted for Ferguson's haemorrhoidectomy without using Ligasure.

Results: Our study on 50 patients shows that, compared to Ferguson's method, Ligasure™ haemorrhoidectomy had a shorter operating time of around 15 minutes, compared to Ferguson's method, which takes more than 30 minutes for the same procedure. Blood loss (20 vs 10 ml), less postoperative pain as measured using the Visual analogue scale, with fewer postoperative complications, including retention of urine and wound dehiscence (18% vs 12%). The most important advantage being less hospital stay and early recovery.

Conclusion: Ligasure coagulates the pedicle of the haemorrhoids in less time, with limited lateral spread of energy without the need for suturing. Fewer post-operative complications in terms of pain, bleeding, and shorter hospital stay compared to Ferguson's method. The easy application, in a shorter time, with minimal post-operative complications and fewer hospital days, makes Ligasure a preferred method over the Ferguson procedure.

Keywords: *Ligasure, Ferguson, haemorrhoidectomy, postoperative complications, hospital stay*

1. INTRODUCTION

There are several theories as to what causes this haemorrhoids, including advancing age, genetics, the lack of valves in the hemorrhoidal vessels, as well as behaviours like eating too little fibre, taking a long time to poop, constipation, and elevated intra-abdominal pressure [1, ·] Depending on the extent of the haemorrhoids, age, comorbidities, etc., patients have a wide range of surgical alternatives[2]. Haemorrhoids of the third and fourth degree with symptoms like constipation, pain and bleeding are mostly treated by haemorrhoidectomy.[3] The Milligan-Morgan haemorrhoidectomy, an open surgical technique, and Ferguson's closed method are the common procedures being done, where a transfixing suture is used to ligate the haemorrhoid pedicle, where postoperative problems, such as bleeding, pain, and wound infection, might result from this.[4] Many surgeons believe that there is a reduced risk of subsequent bleeding if vascular pedicle ligation is avoided, because necrosis and ischemia might result from it. Ligasure with its improved tissue adhesion at the wound site and a preventive approach to painful diathermy burns in the highly innervated anal canal, it seeks to lower the risk of postoperative haemorrhage[5]. Furthermore, deep suture application may result in permanent scarring at the anus in the future, hence, Ligasure is employed by the surgeons to prevent this issue.[6]Ligasure is employed to seal the haemorrhoids using electrical energy, during this surgical treatment, rather than the transfix vascular pedicle. With the help of a precise combination of pressure and radio frequency, the bipolar electrothermal Ligasure vascular sealing technology reduces blood loss. [7] Given this context, the goal of the current study is to compare, in patients with third- and fourth-degree haemorrhoids, the closed method of haemorrhoidectomy is compared with excision using the Ligasure method.

2. PATIENTS AND METHODS

In our prospective single-blinded randomised control study, conducted in the Department of Surgery, Karpaga Vinayaga Institute of Medical Sciences &Research Centre, with 50 consecutive patients presenting with grade III and IV haemorrhoids (Figure 1) for a period of one year from January 2024 to December 2024. Patients were grouped by simple computer randomisation into 2 groups. One group of 25 patients consented to Ligasure haemorrhoidectomy, and 25 patients opted for Ferguson's haemorrhoidectomy without using Ligasure. (Figure 2.) Only adult patients, aged in the range of 20 to 70 years, with third- or fourth-degree haemorrhoids formed the study population. Patients with comorbidities with a history of previous surgery were excluded from our study. In both procedures Manual Anal sphincter stretching maximum 4 fingers. Delivery of hemorrhoidal masses applied at the base of the pedicle, and was coagulated applying Ligasure™ in the Ligasure™ group, and 2 0 chromic catgut was used in Ferguson's method for closing the defect. In contrast to Ferguson's procedure, Ligasure is applied at the base of the haemorrhoid, in which the jaws of the handset are applied to the pedicle and activated by the foot paddle. Energy flow to coagulate the vessels is stopped by an automatic feedback loop, and is automatically stopped once coagulation of the vessels is adequately attained. Curved Mayo's Scissor was used for cutting the haemorrhoid mass after trans fixation and coagulation in each method to remove the haemorrhoid mass. coagulated tissue seal. Only cases in a few when haemostasis is in doubt, anal pack was kept and removed after 24 hours.

Fig.1 Showing Grade IV Haemorrhoids

Figure 2. Ligasure coagulation of the

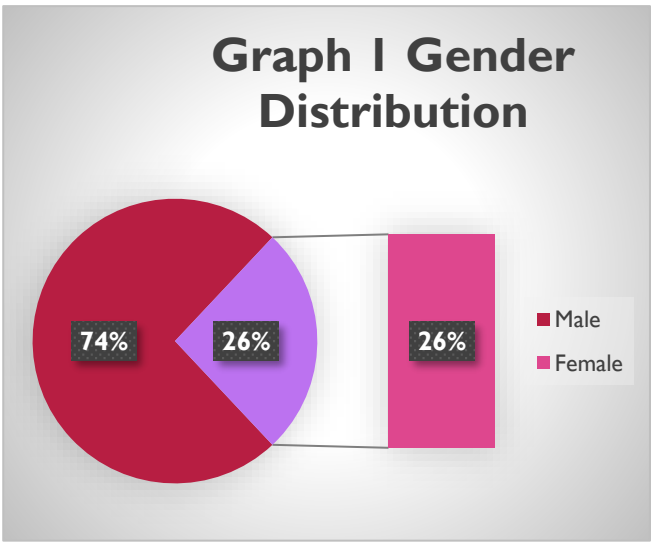
Data analysis

The patient's demographic details, such as age, gender, clinical presentation, and degree of haemorrhoids, were recorded. The surgical technique, operating time, Intraoperative complications, hospital stay, wound healing and complications such

as bleeding, pain, infections, urinary retention, anal stenosis, and residual diseases all recorded. Up to the second week, the patients were monitored in the ward and on an outpatient basis. Each patient enrolled in the research was given a case proforma that included all the information listed above. The recorded data from both groups were put into SPSS 20, analysed with a chi-square test. Patients of both groups who underwent the different procedures were asked to grade the severity of pain on a 0–10 in Visual Analogue Scale (VAS) after 8 hours (day 0), first post-operative day (POD 1), and after a week on follow-up (POD 7).

3. RESULTS

In our study, the patients' age in both groups ranged between 20 and 69 years, with a mean of 42.6±12.58. Most of the patients in both groups belong to the age group 31-40 years. Of the total 50 patients in 16 (64%) in group 1 were males and 9 patients (36%) were females. In group II, 21 patients (84%) were males and only 4 (16%) were females. In both groups together, males form 74% and females 26% (Graph 1)



In our study, out of 50 patients, 36 patients, 19 patients in group I had grade III and 17 had grade IV haemorrhoids, whereas 14 patients, 6 in group II, had grade III and 8 had grade IV haemorrhoids Bleeding per rectum 22 (88%) was the most common clinical presentation in group A, the next common clinical presentation was constipation 21 (84%). Whereas in group B, pain during defecation, 21 (84%), was the most common clinical presentation. In this study, the average operating time in group A and group B was 14±3.74 and 23.3±3.66, respectively, with the P value (P = 0.000), Significant at 1%. In group A, 6 patients didn't have blood loss, 15 patients had a mild blood loss, and 4 patients had a moderate blood loss. While in group B, 4 patients didn't have blood loss, 19 patients had mild blood loss, and 2 patients had moderate blood loss. In Group A of 25 patients, the hospital stay was less than 2 days in 16 cases (64%), while in Group B of 25 patients, the hospital stay was less than 2 days. Only 2 cases (8%) with postoperative stays>2 days in this group. While 9 cases (36%) with postoperative stay > 2 days in group A. Recovery in days in group A was <7 days in 9 (36%) cases and was >7 days in 16 (64%) cases, whereas in group B, the recovery was <7 days in 20 (80%) and >7 days in 5 (20%) cases. Also, we have found Mean±SD, 7.875±3.39 in group A and 4.67±2.61 in group B. Immediately after surgery, 3 patients (12%) in group A and 2 patients (8%) in group B did not experience any pain. Most of the patients in both groups experienced moderate pain. There were no major differences in pain perception in both groups.(Table:1)

Table1.Frequency distribution of Postoperative Complications with Groups.

Postoperative Complications	Group				Total	statistical inference
	A	Per cent (%)	B	Per cent (%)		
Anal stenosis (AS)	5	20%	7	28%	12	**$\chi 2 = 1.289$ P = 0.525 Not Significant at 5%**
Residual disease (RD)	2	8%	1	4%	3	
Urinary retention (UR)	4	16%	2	8%	6	
Total	11	44%	10	40%	21	

The bleeding significantly reduced in both groups on POD 3. On POD 5, none of the patients in group B are bleeding, whereas 1 patient in group A is bleeding. The VAS pain scores on day 0, 1 & 7 in the Ligasure group were 4.1 ± 0.7, 3.1 ± 0.7 and 1.2 ± 0.1, and in the Ferguson's group were 6.8 ± 1.8, 5.2 ± 1.2 and 1.4 ± 0.2, with a p value (<0.001.

4. DISCUSSION

Colonoscopy ought to be required for elderly individuals and those with a personal or family history of inflammatory bowel disease, colorectal neoplasms, or changed bowel habits[8]. In terms of operation time, the frequency of postoperative pain and urine retention, and the time needed to recover, Liga Sure haemorrhoidectomy is superior to Conventional haemorrhoidectomy [9]. Haemorrhoids are a more prevalent condition, particularly in women, yet the male: female ratio in the present study was larger than in the study by Arbman et al. In the present study, we discovered that a greater proportion of patients presented with haemorrhoids in the age range of 31-50 years. Patients in the open group (Group A), where Ligasure was used, reported little discomfort after haemorrhoidectomy compared to those in the closed group (Group B). The treatment of pain following haemorrhoidectomy is gaining attention due to its impact on urine symptoms. Our study found a lower incidence of urine retention (12%) compared to Toyonaga et al. While internal haemorrhoids are less likely to be felt unless they are big or prolapsed, a digital rectal examination (DRE) can reveal lumps, discomfort, and fluctuance Colonoscopy investigates the whole colon, a sigmoidoscopy looks within the final two feet (50 centimetres) of colon, and an anoscope looks in to the anus[10]. To rule out other problems, people with symptomatic haemorrhoids should undergo a pre-operative colonoscopy even if haemorrhoids are visible during inspection. Colonoscopy ought to be required for elderly individuals as well as those with a personal or family history of inflammatory bowel disease. For symptomatic grade III and IV haemorrhoids, haemorrhoidectomy is still the recommended therapeutic option. In recent years, different strategies have been introduced, each with its own set of advantages and disadvantages. Ligsure is an electrosurgical device that improves on bipolar diathermy and is successful at producing haemostasis, known as a 'vessel sealing system. Ligasure™ haemorrhoidectomy significantly outperformed traditional techniques in all criteria. Technically, the Ligasure procedure is significantly easier and may be performed safely and efficiently by less experienced surgeons[11] In comparison with haemorrhoidectomy using the Ligasure method (Group B), Group A had a shorter operating time. The majority in group A had an operating time between 10-15 minutes, vs group B operating time between 20-25 minutes. This is in accordance with the study by R. Khanna et al . In our study small number of patients experienced post-operative infections and bleeding. opera bleeding is relatively less in group B compared to group A. Postoperative complications such as bleeding (76 % vs 52 %), urinary retention (16% vs 8 %) and residual disease (8% vs 4%) were all lower in the group B Ligasure™ group. Anal stenosis (20% vs 28%) was lower in group A. Previous randomised controlled studies have had similar outcomes. Similarly, Mc Connelle and Khucbchandani observed a low rate of postoperative pain, bleeding, infection, and complications with Ligasure over conventional open and closed haemorrhoidectomies. Ligasure is an electrical energy-based surgical device, an improvised version of bipolar diathermy. Haemostasis is better achieved with the effective vessel sealing effect of Ligasure.[12] The advantage of Ligasure is that its energy is delivered only to the grasped tissue between the jaws of the handpiece, with very low spread of energy from the Ligasure device, which prevents damage to the surrounding tissues. Complete sealing of the vessels and easy submucosal dissection make it an ideal choice for haemorrhoidectomies. Compared to bipolar diathermy, better haemostasis of tissues is achieved with minimal tissue damage. The energy is cut automatically by a controlled feedback loop helps easy handling of this device.

Patients in group B recovered much quicker in days, lasting less than 7 days. In the current study, group B had more patients (80%) with completely healed wounds in less than 7 days compared to group A (36%). Previous randomised trials also had similar outcomes. Hospital stay was shorter in group B. Most patients in group A had a hospital stay of>2 days, while group B had < 2 days. Patient compliance is improved by shorter hospital stays, lower costs, and more dependable outcomes. The VAS pain scores at day 0, 1 and 7 were lower in Ligasure™ than Ferguson's haemorrhoidectomy. Postoperative complications such as haemorrhage (3.5% vs 10%), urinary retention (3.5% vs 10%), and wound breakdown (14% vs 20%) were all lower in the Ligasure™ group. The postoperative hospital stay (1.4 vs 3.2 days) was also less with Ligasure™ as was the incidence of residual haemorrhoids (3.5% vs 5%) on follow-up.

5. CONCLUSION

Ligsure is a sutureless procedure, compared to closed haemorrhoidectomy and is safe and more effective, with fewer postoperative complications. Technically, it is superior and simpler, and potential to make haemorrhoidectomy into a day-care The Ligasure procedure offers advantages such as faster operating times, low intra-operative bleeding, and reduced post-operative problems such as bleeding, urine retention, and discomfort. Additional benefits include shorter hospital stays and perhaps early return to work. Though conventional haemorrhoidectomies like Fergusons still hold a place, wherever Ligasure devices are available, it is preferred over conventional haemorrhoidectomies.

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