

(RESEARCH ARTICLE)



Comparative study of Ligasure Haemorrhoidectomy with conventional Milligan-Morgan Haemorrhoidectomy

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Abstract

AIM: Comparison of Ligasure hemorrhoidectomy with conventional Milligan Morgan hemorrhoidectomy for the treatment of grade III and IV hemorrhoids.

Material and Methods: The current study was achieved between December 2020 to December 2022. A total of 64 Patients of grade III and IV hemorrhoids were randomized into two groups, Group A- Ligasure hemorrhoidectomy (32 patients) and Group B- Milligan Morgan hemorrhoidectomy (32 patients). The hemorrhoidal pedicle was coagulated with Ligasure in Group A and transfixed with 1/0 Vicryl in Group B. Procedure time, the amount of lost blood, postoperative pain, and duration of hospitalization were recorded.

Result: Out of 64 patients, there were 38 males and 26 females. The mean age of all patients for group A was 42 years, and for group B, was 48 years. The average procedure time in both group A was 23.6±8 min and in group B 53.5±9 min respectively. The average amount of lost blood was 12.50 ml in group A and 29.40 ml in group B. The VAS pain scores on the 0 day and 7th day in group A were 4.8, and 1.2 respectively and in group B were 7.2, and 2.6 respectively. The duration of hospitalization was 1.4 days and, 3.2 days in both groups, respectively.

Conclusion: The submucosal dissection technique with Ligasure coagulation of the hemorrhoidal pedicle is safe and effective. Suturing is not required as the mucosal tissue over the pedicle is sealed off with the current. There is minimal lateral spread of either thermal or electrical energy. Because of its ease of use and less postoperative pain and complication Ligasure hemorrhoidectomy can be preformed as a day-care procedure.

Keywords: Open Haemorrhoidectomy; Ligasure; Haemorrhoids; Milligan Morgan

1. Introduction

Hemorrhoids are cushions of submucosal tissue containing venules arterioles and smooth muscle fibers that are located in the anal canal. clinically represented as distal displacement or dilatation of the anal cushion [1-3] The prevalence of hemorrhoids is approximately 5%, in the general population.[4] As per Goligher's classification, hemorrhoids is classified into four degrees on clinical examination of degree of prolapse and appearance. [5] First degree hemorrhoids are only upto the anal without any protrusion of anal cushions. In Second degree hemorrhoids there is outward protrusion of anal cushions on straining with spontaneous reduction. In Third degree hemorrhoids there is outward protrusion of anal cushions on straining but it requires manual reduction. In Fourth degree hemorrhoids, there is irreducible outward protrusion of anal cushions through the anal canal. Many complications are associated with fourth degree including incarceration internal piles, thrombosis, inflammation, and mucosal prolapse 6 The correct surgical technique depends on the degree of hemorrhoids, age of the patient, associated complications [7-9]

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Hemorrhoidectomy is standard procedure for the treatment of 3rd and 4th degree hemorrhoids. Milligan Morgan technique is the commonly practiced open surgical procedure using a combination of electrocautery and suture ligation of the hemorrhoid pedicle. Postoperative complications include pain, hemorrhage, and wound infection [11]. Many surgeons agree to the fact that the vascular pedicle ligation itself may increase the chance of secondary hemorrhage, ischemia and necrosis [7-11]

Ligasure system is a bipolar electrothermal device that uses a calculated amount of pressure and radiofrequency to seal blood vessels. The use of Ligasure™ for hemorrhoidectomy was first proposed by Sayfan in 2001 [14].

By using Ligasure, there is no need to suture the vascular pedicle and avoid its drawbacks. The goal of this study is to compare Milligan-Morgan hemorrhoidectomy with ligasure hemorrhoidectomy in the treatment of individuals with 3rd and 4th degree hemorrhoids [13]

2. Material and methods

The current study was conducted at Surgery department of S N Medical College, Agra between December 2020 to December 2022. A total of 64 suffering from 3rd and 4th degrees hemorrhoids were involved. After randomization, the cases were subsequently separated into 2 comparable groups after a thorough explanation of either technique. Group A: 32 patients were scheduled for Ligasure Hemorrhoidectomy. Group B: 32 patients were scheduled for hemorrhoidectomy by Milligan Morgan's technique. All patients gave written consent to participate in our study.

2.1. Inclusion criteria

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

2.2. 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.

2.3. Methods

Preoperative prophylactic antibiotic (ceftriaxone 1g IV) and rectal enema was given to all the patients. All procedures were carried out under spinal anesthesia with patient placed in lithotomy position patient in lithotomy position.

Operative steps (initial few steps were same for both Procedures)

- Manual Anal sphincter stretching.
- Hemorrhoidal mass grasped with allis forceps at the base of hemorrhoid, and by artery forceps at the apex.
- Skin incision made at the mucocutaneous and submucosal dissection to lift the hemorrhoid mass off the internal sphincter is done by monopolar diathermy.

2.3.1. Group A LigaSure hemorrhoidectomy

The jaws of the handset were applied on the pedicle and the instrument activated by the foot paddle (Fig. 1). After achieving coagulation of the vessels and mucosa, scissor was used to excise the hemorrhoid mass by cutting across the coagulated tissue seal. No sutures were applied as the Ligasure device also achieved mucosal fusion. Anal canal packing was done.



Figure 1 The jaws of the handset were applied on the pedicle and the instrument activated by the foot paddle

2.3.2. Group B Conventional Milligan-Morgan hemorrhoidectomy

The pedicle is transfixated and ligated using Vicryl 1-0 (Fig. 2) scissor was used to excise the hemorrhoid mass above the ligature. The wound was left open with a raw surface. Anal canal packing was done.



Figure 2 The pedicle is transfixated and ligated using Vicryl 1-0

3. Results

The mean age of patients undergoing Ligasure hemorrhoidectomy Group A was 42 years and for the Milligan-Morgan hemorrhoidectomy group B was 48 years. The male: female ratio was 9:4 in group A and 7:3 in group B.

The average operating time (excluding anesthesia administering time) in the group A and Group B was 23.6 ± 8 min and 53 ± 9 min respectively (p -value < 0.005). The average intra-operative blood loss as estimated by the number of gauze pieces soaked (5 ml/gauze piece) was 12.5 ± 1.5 ml with Ligasure and 29 ± 3.5 ml with Milligan-Morgan hemorrhoidectomy (< 0.005). The average VAS pain scores on day 0 & 7th in Ligasure group were 4.8 and 1.2 respectively and in the Milligan-morgan group were 7.2 and 2.6 respectively (< 0.005). The average postoperative stay in the Ligasure group was 1.4 days and in the Milligan-Morgan group was 3.2 days (< 0.005) (Table 1).

Table 1 Comparison of operative and post operative factors between the two groups

| Parameter | | Ligasure(n=32) | Milligan-Morgan(n=32) | p value |
|------------------------|---------|----------------|-----------------------|---------|
| Average operating time | | 23.6±8min | 53±9min | <0.005 |
| Average blood loss | | 12.5±1.5ml | 29.4±3.5ml | <0.005 |
| VAS pain score | Day 0 | 4.8 | 7.2 | <0.005 |
| | Day 7th | 1.2 | 2.6 | <0.005 |
| Hospital Stay | | 1.4 Days | 3.2 Days | <0.005 |

In Patients with symptomatic grade 3 and 4 hemorrhoids, some form of hemorrhoidectomy remains the accepted modality of treatment. The traditional methods like the Milligan—Morgan method [15] has been in practice for long time. Recent years have seen the introduction of newer techniques with relative merits and demerits. The most significant recent introduction has been the circular stapling device for prolapsed hemorrhoids. This has been criticized for not treating the external component of hemorrhoids and the skin tags [17]. more over the stapler devices are costly and beyond the reach of most patients. Few years back Ligasure™ device was introduced. It is an electro-surgical device, which is an improved version of bipolar diathermy. It is very effective in achieving hemostasis that it is described as a ‘vessel sealing system’. The energy is delivered only to the tissue grasped within the jaws of the hand piece with minimal spread of electrical or thermal energy to adjacent tissues. Complete coagulation of vessels and also tissues is achieved with minimal charring in contrast to conventional diathermy. A computer controlled feed back loop automatically stops the flow of energy when coagulation of the vessels and mucosa is achieved. The vascularized tissue caught between the jaws is reduced to a wafer thin seal, which can be cut across with scissors. Conventional hemorrhoidectomy is associated with significant pain-related complaints. Additionally meticulous hemostasis needs to be ensured to avoid postoperative hemorrhage. Occasionally the operative field can become quite bloody, prolonging the surgery. We found that Ligasure™ hemorrhoidectomy was a major improvement over the conventional technique in all these parameters. Technically the Ligasure method is much more simpler and can be safely and effectively carried out by relatively inexperienced surgeons. In comparison with Milligan-Morgan method Ligasure™ hemorrhoidectomy had a shorter operating time (53 vs 23.6 minutes, p value <0.005) and had less blood loss (29.4 vs. 12.5 ml, p value:<0.005). The VAS pain scores at day 0 and 7th were lesser in Ligasure™ than Milligan Morgan hemorrhoidectomy. The postoperative hospital stay (1.4 vs 3.2 days) was also less with Ligasure™ . Previous randomized controlled trials have also found similar results. The submucosal dissection avoids inadvertent anal sphincter injury [4]. Compared with Milligan-Morgan hemorrhoidectomy, the Ligasure™ method reduces post-operative pain and the requirement for parenteral analgesia because of minimal collateral thermal spread, limited tissue charring and absence of sutures [19]. Pain during the first 24 hourd is particularly important as it can precipitate urinary retention and constipation.

Other trials have also emphasized the significantly shorter convalescence period. With Milligan—Morgan technique patients were incapacitated for 3 weeks while with the tissue sealing method; patients resumed daily activity after a week[20]. Comparison of Ligasure™ with Harmonic Scalpel™ for hemorrhoidectomy has found that the operative time and postoperative pain were lesser with Ligasure™ [21]. At present conventional hemorrhoidectomy is an in-patient procedure with patients spending 3–7 days in hospital. Ligasure™ hemorrhoidectomy with its numerous proven advantages has the potential to make hemorrhoidectomy in to a day care procedure. It scores over stapled hemorrhoidectomy because of cost advantages and the inherent treatment of the external component of hemorrhoids which are left untreated in stapled hemorrhoidectomy.

4. Conclusion

Ligasure™ hemorrhoidectomy is a sutureless, closed hemorrhoidectomy technique dependent on a modified electrosurgical unit to achieve tissue and vessel sealing. It is safe and effective, has less blood loss, postoperative pain and complications compared to conventional Milligan Morgan hemorrhoidectomy. Technically it is much simpler because suturing is not required and hemostasis is easy to achieve. It has the potential of making hemorrhoidectomy in to a day-care procedure.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest noted

Statement of ethical approval

Institutional ethical committee consent sought.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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