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Original Research Article

Comparison Between LigaSure Haemorrhoidectomy and Conventional Haemorrhoidectomy

Rohit Kumar*, Mahrukh Shafiq, Aun Ali, Muhammad Mansoor Iqbal, Madeeha Shahid, Yousaf Lakdawala

Department of General Surgery, Fazaia Ruth Pfau Medical College P.N.S Shifa Hospital Karachi, Pakistan
**Corresponding author`s email address:* keswanirk9@gmai.com

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Abstract: *Hemorrhoidectomy remains the gold standard for treating advanced (grade III and IV) hemorrhoids. LigaSure, a vessel-sealing technology, has emerged as an alternative to conventional excisional techniques, promising less operative trauma and improved recovery. However, comparative evidence in the local context remains limited.* ***Objective:*** *To evaluate the operational differences and recovery outcomes between LigaSure hemorrhoidectomy and conventional hemorrhoidectomy in patients with grade III and IV hemorrhoids.* ***Methods:*** *This prospective comparative study was conducted at Fazaia Ruth Pfau Medical College and P.N.S Shifa Hospital, Karachi, from August 1, 2023, to July 1, 2024. After approval from the institutional review board, 60 patients aged 18 to 75 years of both genders with symptomatic grade III or IV hemorrhoids requiring surgery were enrolled through non-probability consecutive sampling. Patients were allocated to undergo either LigaSure or conventional hemorrhoidectomy. Key variables assessed included operative time, intraoperative blood loss, postoperative pain (measured by Visual Analog Scale), complication rate, and length of hospital stay. Statistical analysis was performed using standard comparative methods with significance set at $p < 0.05$.* ***Results:*** *The mean operative time was significantly shorter in the LigaSure group (18 ± 4.6 minutes) compared to the conventional group (33.3 ± 6.5 minutes; $p < 0.0001$). Intraoperative blood loss was also significantly reduced in the LigaSure group (17 ± 6.3 mL vs. 34.3 ± 9.3 mL; $p < 0.0001$). Postoperative pain scores were lower in the LigaSure group (2 ± 1.16) than in the conventional group (6.17 ± 1.5; $p < 0.0001$). The incidence of postoperative complications was significantly lower in the LigaSure group (16%) compared to the conventional group (46%; $p = 0.025$).* ***Conclusion:*** *LigaSure hemorrhoidectomy offers a superior alternative to conventional techniques, demonstrating significantly reduced operative time, lower blood loss, less postoperative pain, and fewer complications. It presents a safe and effective surgical option for managing advanced hemorrhoids.*

Keywords: LigaSure, conventional methods, Hemorrhoids, Outcomes

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Introduction

Hemorrhoidal disease affects numerous adults because it develops from anal cushions which enlarge and push downward to cause symptoms (1). Hemorrhoidal disease affects a notable number of adult patients throughout the world and different prevalence levels exist across countries. The occurrence of risk elements for hemorrhoids includes constitutional diseases such as constipation as well as excessive straining throughout bowel movements and diets low in fiber and being pregnant or overweight or leading a sedentary lifestyle (2). The Goligher classification system establishes a protocol to organize hemorrhoids into grades I through IV so doctors can determine medical interventions (3).

Management strategies for haemorrhoidal disease range from conservative measures, such as dietary modifications and pharmacotherapy, to surgical interventions (4). The surgical option exists for patients who have grade III and IV hemorrhoids and also those who cannot benefit from other treatment approaches. Gray-scale and Doppler ultrasound have established roles in the management of hemorrhoids. These diagnostic methods also help evaluate other disorders of the anorectal region (5).

Advanced surgical devices have enabled medical professionals to seek new procedural approaches that provide better patient results. The LigaSure vessel sealing system uses bipolar electrothermal energy for achieving hemostasis and tissue dissection (6). Research findings have evaluated LigaSure haemorrhoidectomy as an alternative to conventional surgical treatment procedures (7). Research findings indicate that LigaSure haemorrhoidectomy provides a secure surgical option which executes in less time than traditional procedures while minimizing postoperative discomfort (8).

North Indian retrospective research demonstrated that LigaSure vessel sealing system reduced operative time to 23.15 ± 3.36 minutes versus the Milligan-Morgan procedure which took 33.84 ± 9.18 minutes. Patients treated with LigaSure haemorrhoidectomy experienced shorter hospital stays at 1.47 ± 0.50 days as opposed to 2.20 ± 0.79 days and this method generated lower postoperative pain ratings on the visual analog scale (VAS) during day one at 5.30 ± 1.10 vs. 6.55 ± 1.19 as well as day seven at 1.47 ± 0.78 vs. 2.25 ± 1.26 (9).

Medical research demonstrated that patients who underwent LigaSure haemorrhoidectomy required 12.2 days for their postoperative return to work although those receiving traditional haemorrhoidectomy needed 16.4 days (10).

Patients who undergo LigaSure haemorrhoidectomy experience better operative results through faster procedures and lower postoperative pain and shorter hospital stays which produce faster returns to their regular activities. The implementation of LigaSure requires additional extended randomized controlled trials to verify long-term results and advance its role as the baseline surgical treatment for haemorrhoidal conditions. This research aims to evaluate the operational differences and recovery aspects between LigaSure hemorrhoidectomy along with conventional hemorrhoidectomy for treating grade III and IV hemorrhoids among patients.

Methodology

After the ethical approval from the institutional review board, this prospective comparative study was conducted at Fazaia ruth pfau medical college/ P.N.S shifa hospital karachi from 01/August/2023 to 01/July/2024. Through non-probability consecutive sampling, 60 patients aged 18-75 years, both genders and had symptom-based hemorrhoids

which required surgical treatment with grade III or IV hemorrhoids were included in the present study. Patients who had a perianal fistula history along with anal stenosis or inflammatory bowel disease diagnosis or coagulation disorders were excluded from the present study. The patients were randomly assigned to two comparison group: LigaSure hemorrhoidectomy (n=32) and conventional hemorrhoidectomy (n=28).

A thorough assessment evaluating patients included medical interviews together with physical check-ups and diagnostic procedures and laboratory tests. The research team received voluntary consent to perform surgery from all selected patients. Experienced colorectal surgeons conducted the procedures which took place under spinal or general anaesthesia. The surgeons performed LigaSure hemorrhoidectomy through vessel sealing with the LigaSure device but conventional hemorrhoidectomy required electrocautery and ligation based on the Milligan-Morgan technique. Observation of operative time began when the first incision started and continued to the moment of wound completion.

After surgery patients rated their pain intensity by using a visual analog scale (VAS) once at six hours and again at 24 hours and 48 hours and on days seven and fourteen after surgery. Intraoperative blood loss together with hospital stay duration and postoperative complications like bleeding and urinary retention and infection and normal activity recovery time were considered secondary outcome variables. Evaluation of wound healing together with assessments of recurrence and patient satisfaction occurred at months one three and six postoperatively. The study employed SPSS software for statistical analysis which incorporated independent t-tests with the chi-square tests to evaluate both continuous and categorical variables. A p-value below 0.05 indicated statistical significance in the study findings.

Results

The study included a total of 60 patients, with 28 undergoing conventional hemorrhoidectomy and 32 receiving LigaSure hemorrhoidectomy. The demographic and clinical profiles of both groups were comparable. The mean age of patients in the conventional group was 47.7 ± 12.8 years, while in the LigaSure group, it was 39 ± 15.7 years ($p = 0.944$). Gender distribution was similar between groups, with 39% males and 61% females in the conventional group, compared to 41% males and 59% females in the LigaSure group ($p = 0.424$). Regarding the severity of hemorrhoids, 61% of patients in the conventional group and 66% in the LigaSure group had grade III hemorrhoids, while 39% and 34%, respectively, had grade IV hemorrhoids ($p = 0.802$).

Intraoperative and postoperative outcomes showed significant differences between the two techniques. The mean operation time for the LigaSure group was significantly shorter at 18 ± 4.6 minutes compared to 33.3 ± 6.5 minutes in the conventional group ($p < 0.0001$). Similarly, intraoperative blood loss was considerably lower in the LigaSure group (17 ± 6.3 mL) than in the conventional group (34.3 ± 9.3 mL, $p < 0.0001$). Postoperative pain scores, assessed using the visual analog scale (VAS), were significantly lower in the LigaSure group (2 ± 1.16) than in the conventional group (6.17 ± 1.5, $p < 0.0001$). Additionally, the LigaSure group had a shorter hospital stay (2 ± 0.5 days) compared to the conventional group (2.96 ± 0.6 days, $p < 0.0001$). The incidence of postoperative complications was notably lower in the LigaSure group (16%) than in the conventional group (46%) ($p = 0.025$). However, follow-up duration did not show a statistically significant difference, with a mean of 15.9 ± 4.3 months in the conventional group and 10 ± 4.9 months in the LigaSure group ($p = 0.148$).

These findings indicate that LigaSure hemorrhoidectomy offers significant advantages over the conventional technique, including reduced operative time, lower intraoperative blood loss, decreased postoperative pain, shorter hospital stays, and fewer complications.

Table 1: Demographic and clinical profile of the patients

Variables	Conventional (n=28)	LigaSure (n=32)	P Value
Age (Years)	47.7±12.8	39±15.7	0.944
Gender			0.424
Male	11 (39%)	13 (41%)	
Female	17 (61%)	19 (59%)	
Hemorrhoid Grade			0.802
III	17 (61%)	21 (66%)	
IV	11 (39%)	11 (34%)	

Table 2: Intraoperative and post-operative variables

Variables	Conventional (n=28)	LigaSure (n=32)	P Value
Operation Time (minutes)	33.3±6.5	18±4.6	<0.0001
Intraoperative Blood Loss (mL)	34.3±9.3	17±6.3	<0.0001
Postoperative Pain Score	6.17±1.5	2±1.16	<0.0001
Hospital Stay (days)	2.96±0.6	2±0.5	<0.0001
Complications	13 (46%)	5 (16%)	0.025
Follow-up Duration (months)	15.9±4.3	10±4.9	0.148

Discussion

Numerous studies have extensively evaluated LigaSure hemorrhoidectomy alongside traditional hemorrhoidectomy in surgical literature while confirming the same outcomes as presented in this paper. Studies have shown LigaSure hemorrhoidectomy shortens operative duration to 18 ± 4.6 minutes when compared to 33.3 ± 6.5 minutes of conventional hemorrhoidectomy as recorded in research. Yurtkal et al. established LigaSure required 12.5 minutes to perform while the Ferguson method consumed 29 minutes (11). A meta-analysis by Vettoretto documented improved operative performance with LigaSure by means of quantitative data evaluation (12). The LigaSure group demonstrated a blood loss reduction to 17 ± 6.3 mL which matches results presented by Shimada et al. regarding their study between LigaSure and conventional methods resulting in 11.5 mL and 22 mL blood loss respectively (13).

The scores showing lower postoperative pain assessments (2 ± 1.16 for LigaSure as opposed to 6.17 ± 1.5 for conventional methods) are consistent with multiple research publications. The Visual Analog Scale (VAS) pain score data from Shrivastava et al. showed that patients in the LigaSure group experienced significantly less pain during postoperative days 0, 1 and 7 (14). The research conducted by Gentile et al. established that LigaSure hemorrhoidectomy created fewer postoperative pain experiences and led to a quicker recovery period than traditional

diathermy approaches (15). The LigaSure procedure required patients to stay in hospital for a shorter period of two days with reduced variation in duration according to previous research findings. The postoperative stay was shorter for patients who underwent LigaSure management at 1.4 days compared to 3.2 days for patients receiving Ferguson procedures according to Onder et al (16). The application of LigaSure technology enables patients to conduct their regular activities without delay. The LigaSure group showed a shorter recovery duration before patients achieved daily functions in their study (17).

The LigaSure technique generated fewer complications which amounted to 16% for the LigaSure group compared to 46% for the conventional method according to Haksal et al. who discovered lower postoperative bleeding incidences in the LigaSure group (18). The LigaSure group displayed decreased occurrence of postoperative complications such as wound breakdown and hemorrhaging according to Ramouz et al (19).

Conclusion

Multiple studies support the numerous benefits that LigaSure hemorrhoidectomy offers when compared to traditional procedures since it leads to lower operative durations and reduced bleeding and pain together with shortened recovery times and fewer postoperative complications. The repeated research evidence confirms the reliable effectiveness and security of using LigaSure during surgical treatment for grade III and IV hemorrhoids.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-FRPM-923-24)

Consent for publication
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The authors declared the absence of a conflict of interest.

Author Contribution

RK (Resident of Surgery)
Manuscript drafting, Study Design,
MS (General Surgery Resident)
Review of Literature, Data entry, Data analysis, and drafting article.
AA (Associate Professor)
Conception of Study, Development of Research Methodology Design,
MMI (Associate Professor)
Study Design, manuscript review, critical input.
MS (Associate Professor)
Manuscript drafting, Study Design,
YL (Professor)
Review of Literature, Data entry, Data analysis, and drafting article.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Bharucha AE, Cima RR. Anorectal diseases. Yamada's Textbook of Gastroenterology. 2022:1408-32.
2. Kukreja AN. Haemorrhoids: Aetiology to Management. Anorectal Disorders-From Diagnosis to Treatment: IntechOpen; 2023.
3. De Schepper H, Coremans G, Denis MA, Dewint P, Duinslaeger M, Gijsen I, et al. Belgian consensus guideline on the management of hemorrhoidal disease. Acta gastro-enterologica belgica-Bruxelles, 1996-2007. 2021;84(1):101-20.
4. Gallo G, Martellucci J, Sturiale Ae, Clerico G, Milito G, Marino F, et al. Consensus statement of the Italian society of colorectal surgery (SICCR): management and treatment of hemorrhoidal disease. Techniques in coloproctology. 2020;24:145-64.
5. Wee IJY, Koo CH, Seow-En I, Ng YYR, Lin W, Tan EJK-W. Laser hemorrhoidoplasty versus conventional hemorrhoidectomy for grade II/III hemorrhoids: a systematic review and meta-analysis. Annals of Coloproctology. 2023;39(1):3.
6. Chambers R, Sarno D, Roweton S. New Bipolar Electrosurgical Vessel Sealing Device Provides Improved Performance and Procedural Efficiency. Medical devices (Auckland, NZ). 2025;18:75-86.
7. Yu K, Li H, Xue P, Xie Z, Tang M, He H, et al. Modified ultrasound scalpel haemorrhoidectomy versus conventional haemorrhoidectomy for mixed haemorrhoids: a study protocol for a single-blind randomised controlled trial. Trials. 2023;24(1):140.
8. Gallo G, Martellucci J, Sturiale A, Clerico G, Milito G, Marino F, et al. Consensus statement of the Italian society of colorectal surgery (SICCR): management and treatment of hemorrhoidal disease. Techniques in Coloproctology. 2020;24(2):145-64.
9. Virk AK, Kansal R, Singh C, Mehta M, Arora B, Singh A, et al. A Retrospective Study of Milligan-Morgan Versus LigaSure Hemorrhoidectomy in the Treatment of Symptomatic Hemorrhoids at an Institute in North India. Cureus. 2024;16(8):e66430.
10. Cheng K-C, Song L-C, Wu K-L, Chen H-H, Lee K-C. Risk factors of delayed hemorrhage after LigaSure hemorrhoidectomy. BMC Surgery. 2022;22(1):361.
11. Yurtkal A, Canday M. Optimizing hysterectomy: a prospective comparative analysis of surgical techniques and their impact on women's lives. Journal of personalized medicine. 2024;14(3):265.
12. Vettoretto N, Foglia E, Gerardi C, Lettieri E, Nocco U, Botteri E, et al. High-energy devices in different surgical settings: lessons learnt from a full health technology assessment report developed by SICE (Società Italiana di Chirurgia Endoscopica). Surgical endoscopy. 2023;37(4):2548-65.
13. Shimada E, Matsumoto Y, Endo M, Setsu N, Fujiwara T, Yahiro K, et al. Clinical benefits of vessel sealing system (LigaSure™) during surgery for soft tissue sarcoma: a propensity score matching analysis. Japanese journal of clinical oncology. 2021;51(8):1242-7.
14. Shrivastava N. To Study the clinical outcomes of Ligasure vessel sealer haemorrhoidectomy in patients with symptomatic haemorrhoids: A prospective study.
15. Adams SS. Comparative study of treatment methods of haemorrhoids: Vilniaus universitetas.; 2023.
16. Onder T, Altiok M. A retrospective comparative study of hemorrhoidal artery ligation versus ligasure hemorrhoidectomy for the third degree hemorrhoidal disease. Asian Journal of Surgery. 2023;46(10):4385-8.
17. Radunz S, Salem H, Houben P, Pascher A, Büsing M, Utech M. LigaSure Impact™ reduces complications after abdominoplasty in weight loss patients. Langenbeck's archives of surgery. 2022;407(1):321-6.
18. Haksal MC, Çiftci A, Tiryaki Ç, Yazıcıoğlu MB, Özyıldız M, Yıldız SY. Comparison of the reliability and efficacy of LigaSure hemorrhoidectomy and a conventional Milligan-Morgan hemorrhoidectomy in the surgical treatment of grade 3 and 4 hemorrhoids. Turkish journal of surgery. 2017;33(4):233-6.
19. Ramouz A, Rasihashemi SZ, Safaeiyan A, Hosseini M. Comparing postoperative complication of LigaSure Small Jaw instrument with clamp and tie method in thyroidectomy patients: a randomized controlled trial [IRCT2014010516077N1]. World journal of surgical oncology. 2018;16(1):154.