

Original Article

Efficacy and Safety of Laser Hemorrhoidoplasty with Wedge Resection: A Retrospective Cohort Study

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Key Words

Hemorrhoidal disease;
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Postoperative complications;
Recurrence;
Patient satisfaction

Background. Laser hemorrhoidoplasty (LHP) combined with wedge resection has emerged as a minimally invasive approach for treating symptomatic hemorrhoidal disease. However, the effect of postoperative complications on clinical outcomes remains underexplored.

Methods. This retrospective cohort study included 73 patients with BPRST classification (bleeding, prolapse, reduction, skin tags, and thrombosis) stage II or III hemorrhoids who underwent LHP with wedge resection between April 2022 and April 2023. Patients were divided into complication and non-complication groups, and clinical parameters, recurrence rates, and patient satisfaction were analyzed over at least 24 months of follow-up using the patient-reported outcome measure–hemorrhoidal impact and satisfaction (PROM-HISS) score. Statistical analyses included the Mann-Whitney U test, chi-square or Fisher's exact test, and univariate logistic regression.

Results. Twelve patients (16.4%) experienced postoperative complications, most commonly bleeding (grade I) and urinary retention (grade II-IIIa). No significant differences were observed in the baseline characteristics or perioperative laser energy between the groups. However, recurrence rates were higher (28.6% vs. 5%, $p = 0.1$) and satisfaction was lower (71.4% vs. 95%) in the complication group than in the non-complication group. Logistic regression identified postoperative complications as the only significant predictor of recurrence (odds ratio, 43.26; 95% confidence interval, 1.20-1566.64; $p = 0.03$).

Conclusion. Postoperative complications following LHP with wedge resection were significantly associated with high recurrence rates and low patient satisfaction, regardless of being mild. These findings underscore the importance of meticulous surgical technique and close follow-up to optimize long-term outcomes.

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Hemorrhoidal disease, a common anorectal condition, affects millions of individuals worldwide, with symptoms ranging from mild discomfort to significant pain, bleeding, and prolapse that can im-

pair quality of life.¹⁻³ Traditional surgical treatments, such as Ferguson hemorrhoidectomy or Milligan–Morgan hemorrhoidectomy, have long been the gold standard for managing symptomatic hemorrhoids,

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particularly in advanced stages. However, these procedures are often associated with substantial postoperative pain, prolonged recovery periods, and a notable risk of complications, leading to the development of less invasive alternatives.^{4,6} Laser hemorrhoidoplasty (LHP) has emerged as a promising technique, utilizing a 1470-nm wavelength laser that is absorbed by water in the tissue. This absorption causes the vessel walls to close, leading to ablation of the targeted area. Consequently, LHP offers a minimally invasive approach intended to reduce pain, accelerate recovery, and maintain efficacy through precise tissue ablation.^{7,8}

The integration of wedge resection with LHP represents a hybrid approach designed to improve outcomes by addressing mucosal prolapse and hemorrhoidal tissue volume while preserving anal sphincter function. In current practice, LHP is typically performed for the internal component; however, a V-shaped wedge resection is added when a hemorrhoid has a prominent external part. This “combination” approach targets both components of the same hemorrhoid as needed rather than applying uniform internal–external excision across all cases.⁹ Arterial ligation is not routinely performed and is reserved for selected cases based on intraoperative bleeding. Despite growing clinical interest, evidence on the efficacy and safety of this combined procedure remains limited, particularly regarding postoperative complications, recurrence rates, and patient satisfaction. Understanding these outcomes is critical to optimizing surgical techniques and improving patient care, particularly given the variability in patient demographics and disease severity.

This study aimed to evaluate the efficacy and safety of LHP combined with wedge resection in treating symptomatic hemorrhoidal disease and to explore how postoperative complications may influence short-term and long-term outcomes, including recurrence rates and patient satisfaction. By comparing patients with and without postoperative complications, this study sought to identify specific preoperative clinical characteristics that could help predict high-risk individuals before undergoing surgery. Prompt identification of such high-risk patients would facilitate the selection of more tailored perioperative management

strategies, promote complication prevention, and ultimately optimize surgical outcomes.

Materials and Methods

Patient selection

This retrospective cohort study included patients diagnosed with stage II or III hemorrhoidal disease according to the bleeding, prolapse, reduction, skin tags, and thrombosis (BPRST) classification system, which was proposed by Sobrado Júnior et al.¹⁰ All patients underwent LHP combined with wedge resection. A total of 73 patients were enrolled at the Ministry of Health and Welfare Taoyuan General Hospital between April 2022 and April 2023. These patients received outpatient follow-up (median: 24 days) (Fig. 1). Among them, 47 completed telephone follow-up interviews using the patient-reported outcome measure—hemorrhoidal impact and satisfaction score (PROM-HISS; Appendix A).¹¹ Seventeen patients declined to participate in the telephone follow-up interviews, and nine patients were lost to follow-up. Patients were categorized into groups based on the presence or absence of postoperative complications, and the effect of these complications on clinical outcomes was analyzed.

Surgical procedure

Under spinal anesthesia, the patient was placed in the jackknife-prone position. After preparing the perineal area, an anal retractor was inserted to facilitate precise grasping of the hemorrhoidal tissue using long, smooth forceps. A small incision was made at the intersphincteric groove, followed by laser treatment. A 1470-nm diode laser probe, (neoLaser, Israel) was inserted into the perianal skin and advanced submucosally.¹² After laser treatment for one pile, an ice column was introduced into the anal canal and kept in place for 1 minute to provide cooling and compression, reduce swelling, and promote hemostasis. An external hemorrhoidectomy was performed for mixed hemorrhoids, and the wound was closed using 3-0 Vicryl with interrupted sutures. To ensure hemostasis,

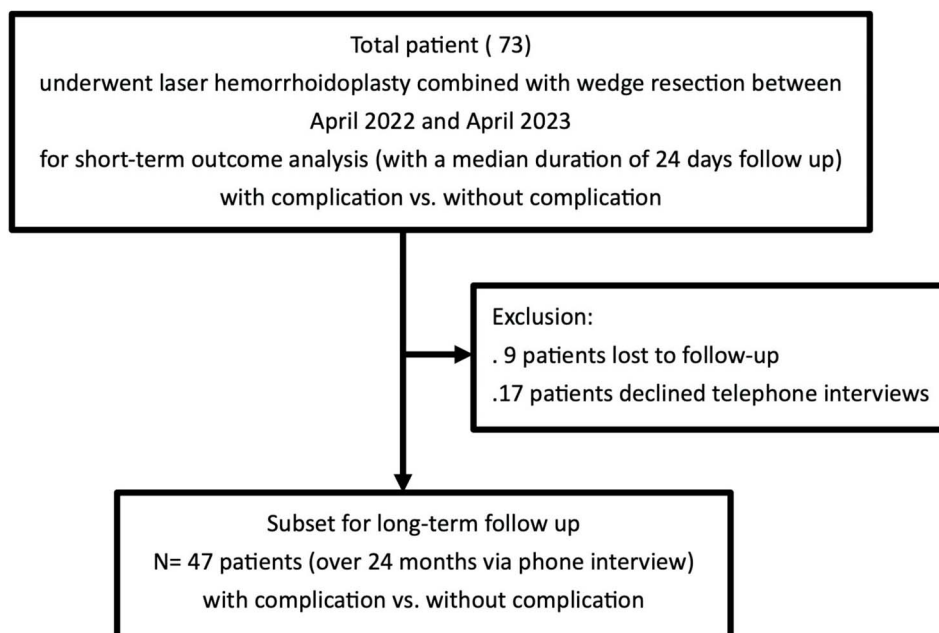


Fig. 1. Flow diagram of patient enrollment and follow-up.

the presence of any active bleeding was checked. Finally, a Gelfoam sponge and gauze pad were placed between the buttocks for compression and support.

Postoperative management and follow-up

Postoperative pain was managed using standard analgesic protocols, including oral nonsteroidal anti-inflammatory drugs and opioids as needed. Pain levels were assessed at 6 and 24 hours postoperatively using a numerical rating scale (NRS 0-10). Follow-up evaluations were conducted at regular intervals over 60 days via outpatient clinic visits. Additional long-term follow-up was performed through telephone questionnaire surveys at a minimum follow-up of 24 months. In our study, there is currently no definition of “recurrence” after hemorrhoid surgery, and long-term follow-up poses challenges, as asymptomatic patients are unlikely to return for examination. Therefore, we defined recurrence as the re-appearance of hemorrhoidal symptoms leading the patient to seek medical consultation at our hospital or any other healthcare facility.

Statistical analysis

Descriptive statistics were used to summarize pa-

tient characteristics. Continuous variables were expressed as medians with interquartile ranges (IQRs), and categorical variables were reported as counts and percentages. For continuous variables, comparisons between groups with and without complications were performed using the Mann–Whitney U test for continuous variables. For categorical variables, chi-square tests were used to compare sex and postoperative pain at 24 hours, while Fisher’s exact test was applied to all other categorical variables. Logistic regression analysis was used to identify factors associated with recurrence, with statistical significance set at $p < 0.05$. All statistical analyses were performed using SPSS software.

Results

This study included 73 patients who underwent LHP combined with wedge resection, and they were categorized into two groups based on the presence or absence of postoperative complications. Postoperative complications developed in 12 patients (16.4%), while 61 patients (83.6%) experienced no complications.

Postoperative complications were classified using

the Clavien–Dindo system. Five patients experienced postoperative bleeding (grade I) managed conservatively with epinephrine gauze. Urinary retention occurred in six patients: four resolved with medical treatment (grade II), but the others required temporary urinary catheterization (grade IIIa). One patient had a postoperative infection, which was successfully treated with oral antibiotic therapy (grade II).

As presented in Table 1, no significant differences in baseline characteristics were found between the groups. The median ages were 48 years (IQR, 44-56) and 48 years (IQR, 42-56) in the complication and non-complication group ($p = 0.46$). The groups had comparable body mass index (BMI), with a median of 25.0 kg/m² ($p = 0.37$). Sex distribution, American Society of Anesthesiologists (ASA) classification, and

early postoperative pain scores (at 6 and 24 hours) also showed no significant differences ($p > 0.05$ for all). These findings imply that the two groups were demographically and clinically comparable at baseline, minimizing potential confounders.

Table 2 presents the perioperative data. The median total laser energy applied was not significantly different between the groups with complications (1209.5 J; IQR, 1076.75-1270.5) and without complications (1163.0 J; IQR, 1063.0-1212.0) ($p = 0.28$). Similarly, energy applied at the 3, 7, and 11 o'clock positions showed no significant differences ($p = 0.51, 0.11$, and 0.95 , respectively). Median operative time did not differ significantly between the complication and non-complication groups (37.5 vs. 40.0 minutes; $p = 0.72$); median hospital stay was also similar (3.0 vs. 2.0 days;

Table 1. Comparison of clinical characteristics between patients with and without complication (< 60 days follow up)

	Total		With complication		Without complication		<i>p</i> -value
	N	%	n	%	n	%	
Age*	73	100	12	16.4	61	83.6	0.46
	48.0 (44.0-56.0)		51.5 (44.75-60.5)		48.0(42.0-56.0)		
BMI*	25.0 (22.0-27.0)		25.0 (22.75-29.75)		25.0 (22.0-27.0)		0.37
Gender**							0.56
Male	41	56.2	7	58.3	34	55.7	1.0
Female	32	43.8	5	41.7	27	44.3	
ASA**							1.0
I/II	69	94.5	12	100	57	93.4	
III	4	5.5	0	0	4	6.6	0.46
BPRST classification**							
II	35	47.9	4	33.3	31	50.8	0.46
III	38	52.1	8	66.7	30	49.2	

* Express as median (IQR). ** Express as count and percentage.

Table 2. Comparison of clinical characteristics between patients with and without complication (< 60 days follow up)

	Median (IQR)	With complication	Without complication	<i>p</i> -value
		Median (IQR)	Median (IQR)	
Total laser energy*	1169.0 (1063.0-1224.0)	1209.5 (1076.75-1270.5)	1163.0 (1063.0-1212.0)	0.28
Laser energy at 3''*	379.0 (326.0-422.0)	394.0 (337.5-424.5)	379.0 (326.0-414.0)	0.51
Laser energy at 7''*	384.0 (343.0-420.0)	414.5 (375.25-432.25)	380.0 (343.0-414.0)	0.11
Laser energy at 11''*	383.0 (360.0-430.0)	396.0 (354.0-430.5)	383.0 (360.0-421.0)	0.95
OP time (mins)	40.0 (35.0-45.0)	37.5 (34.5-46.25)	40 (35.0-45.0)	0.72
Hospital stay (day)*	3.0 (2.0-3.0)	3.0 (2.0-3.25)	2.0 (2.0-3.0)	0.47
Post-op pain index (6h)*	2 (2-3)	3 (2-3)	2 (2-3)	0.47
Post-op pain index (24h)*	0 (0-1)	0 (0-1)	0 (0-1)	0.62

* Express as median (IQR).

$p = 0.47$). Results indicate that neither the energy dosage nor the length of hospitalization was associated postoperative complications.

Among the 47 patients who completed at least 24 months of follow-up, long-term clinical outcomes are summarized in Table 3. Among them, 7 (14.9%) experienced postoperative complications, and the remaining 40 (85.1%) had an uneventful recovery. The recurrence rate was higher in the group with complications (28.6%) than in the group without complications (5%), approaching statistical significance ($p = 0.1$). Regarding patient satisfaction, the overall response was notably positive. Of the 47 patients who completed the telephone follow-up and filled out a PROM-HISS questionnaire, 51.06% ($n = 24$) rated their satisfaction at the maximum score of 10, and 40.43% ($n = 19$) provided a score of 7-9. Only 8.51% ($n = 4$) rated their satisfaction between 1 and 3, reflecting some dissatisfaction or a suboptimal postoperative experience. Notably, all patients who rated their satisfaction between 7 and 10 indicated that they would recommend this surgical approach to others, underscoring not only favorable clinical outcomes but also high patient confidence. Satisfaction rates were also lower in the group with complications (71.4%) than in those without complications (95%). Although not significant, these trends indicate a clinically relevant association between early postoperative complications and diminished long-term satisfaction and recurrence outcomes. Univariate logistic regression analysis (Table 4) revealed that postoperative complications were the only significant pre-

dictor of recurrence at long-term follow-up (odds ratio [OR], 43.26; 95% confidence interval [CI], 1.20-1566.64; $p = 0.03$). Other variables, including age, sex, BMI, ASA classification, and total laser energy, did not show a significant association with recurrence. This finding highlights the substantial effect of early postoperative complications on long-term treatment efficacy.

Although early postoperative complications were not associated with significant differences in immediate clinical parameters such as pain or hospital stay, their presence was strongly linked to higher recurrence rates and lower patient satisfaction over time. This emphasizes the importance of meticulous surgical technique and vigilant postoperative care to prevent complications. Moreover, patients who develop complications may benefit from closer surveillance and follow-up to reduce the risk of recurrence.

Table 4. Univariate logistic regression analysis of recurrence status for long-term outcomes (follow-up of at least 24 months)

	OR (95% CI)	<i>p</i> -value
Age	2.58 (0.13-51.259)	0.53
Gender	0.96 (0.825-1.121)	0.61
BMI	1.03 (0.714-1.498)	0.85
ASA	0.12 (0.018-1.802)	0.30
Total laser energy	0.99 (0.987-1.011)	0.80
BPRST classification, Stage	0.15 (0.006-4.28)	0.27
Post-operative complications	43.26 (1.197-1566.637)	0.03

Table 3. Comparison of clinical characteristics between patients with and without complications for long-term outcomes (follow-up of at least 24 months)

	Total		With complication		Without complication		<i>p</i> -value
	N	%	n	%	n	%	
Recurrence**	47	100	7	14.9	40	85.1	
None	43	91.5	5	71.43	38	95	0.1
Recurrence	4	8.5	2	28.57	2	5	
Satisfaction** (PROM-HISS satisfaction score)							
Score 7-10	43	91.5	5	71.43	38	95	
Score 1-3	4	8.5	2	28.57	2	5	
Follow up time (month)*	25.0 (22.0-27.0)		24.0 (20.5-27.0)		25.0 (22.0-27.2)		

* Express as median (IQR). ** Express as count and percentage.

Discussion

LHP has emerged as a safe and effective surgical modality for hemorrhoidal disease, offering minimal postoperative pain compared with conventional techniques. This retrospective cohort study aimed to evaluate risk factors associated with postoperative complications and recurrence following LHP with wedge resection and patient satisfaction.

Patients who developed postoperative complications tended to be older (median age, 48; IQR, 44-56 years) compared with those without complications (median age, 48; IQR, 42-56 years) ($p = 0.46$). Although not statistically significant, this mirrors previous evidence suggesting that even modest age differences in middle-aged populations may affect wound healing. Age-related changes, such as reduced angiogenesis, diminished fibroblast activity, and delayed inflammatory responses, have been found to impair wound healing, even in patients younger than traditionally defined geriatric thresholds.¹³⁻¹⁵

Similarly, although the median BMI (25.0 kg/m^2) was comparable in both groups ($p = 0.37$), emerging evidence indicates that borderline overweight status ($\text{BMI} \geq 25$) may negatively affect surgical outcomes by altering local perfusion and oxygenation, increasing tissue hypoxia and vulnerability to infection.¹⁶⁻¹⁸ The adipose tissue hinders microvascular circulation and promotes a proinflammatory environment, which may compromise tissue repair. These physiological insights, although not reflected in the significance observed in our limited sample size, indicate that age and BMI may still represent meaningful factors in the stratification of postoperative risk.

Regarding perioperative parameters, laser energy settings were comparable between the groups, with no significant differences observed in the total energy delivered (median, 1209.5 vs. 1163.0 J, $p = 0.28$) or the energy applied at the 3, 7, and 11 o'clock positions. These findings indicate that within the standard operational range, laser energy is unlikely to be the primary determinant of postoperative complications or recurrence. This is consistent with the findings of Naderan et al., who found no significant correlation between the total laser energy applied and adverse outcomes

following LHP.¹⁹ Nevertheless, factors such as anatomical variability, the surgeon's experience, and precision in energy application may still influence surgical outcomes in nuanced ways that are not fully captured by aggregate energy values.

Postoperative pain levels at 6 and 24 hours were also comparable between patients with and without complications ($p > 0.05$), indicating that minor complications, such as urinary retention or mild bleeding, may not substantially influence early pain perception. This result aligns with findings of Jain et al., who demonstrated significantly lower early postoperative pain scores in patients who underwent LHP than in those who underwent conventional open hemorrhoidectomy.²⁰ The minimal difference in pain scores in the present study may reflect standardized perioperative analgesia protocols and the inherently less traumatic nature of LHP, which avoids tissue excision and preserves the anoderm integrity. These results reinforce the role of LHP as a minimally invasive option that offers favorable postoperative comfort and recovery profiles.

Our findings reveal a noteworthy association between early postoperative complications and adverse long-term outcomes following LHP combined with wedge resection. Although most complications in our cohort were minor — such as grade I bleeding or transient urinary retention (grade II or IIIa) — they were significantly correlated with higher recurrence (28.6% vs. 5%) and lower patient satisfaction (71.4% vs. 95%) rates. In this study, the surgical design was “LHP combined with wedge resection”, which is a hybrid procedure. Due to its retrospective nature, the specific location of postoperative bleeding was not documented in detail. Therefore, in our analysis and discussion, postoperative bleeding was considered as an overall postoperative event without distinguishing whether it was attributable to LHP or wedge resection. In our cohort, postoperative urinary retention occurred in 6 out of 73 (8.2%) patients, including four cases managed with medications (grade II) and two requiring short-term urinary catheterization (grade IIIa). All cases were transient and resolved without long-term urinary sequelae. The incidence of postoperative urinary retention following anorectal surgery widely ranges from 1% to 52%, with hemorrhoidectomy-specific rates

frequently falling between 15% and 37%.²¹⁻²³ Lin et al.²³ reported an overall urinary retention rate of 22%-37% within 24 hours after hemorrhoidectomy and a 19.3% incidence of acute urinary retention when performed under spinal anesthesia. Similarly, a large cohort study involving 2,011 patients undergoing benign anorectal surgery under spinal anesthesia reported an overall urinary retention rate of 16.7%, with 21.9% in the hemorrhoidectomy subgroup.²² Other studies have demonstrated that spinal anesthesia increases the risk of POUR by 2.3 times compared with general anesthesia and up to 8.1-fold when long-acting agents, such as hyperbaric bupivacaine, are used.²⁴ In this study, the observed rate was not high by comparison. Furthermore, all patients underwent the procedure under spinal anesthesia, suggesting that urinary retention in this cohort was likely related to the anesthetic method.

Importantly, logistic regression identified postoperative complications as the sole significant predictor of recurrence at long-term follow-up (OR, 43.26; 95% CI, 1.20-1566.64; $p = 0.03$), underscoring the prognostic importance of early events, even when clinically manageable. This observation aligns with the results of previous studies. Kammerlander et al. demonstrated that despite the advantages of LHP in reducing postoperative pain and promoting faster recovery, recurrence rates can still range from 5% to > 30%, particularly when complications occur.²⁵ Similarly, Poskus et al. reported that recurrence is often underestimated in minimally invasive procedures and is frequently linked to inadequate healing or persistent inflammation triggered by early complications.²⁶ These findings support our results and suggest that early postoperative events may interfere with tissue remodeling or sustain local inflammation, ultimately increasing the recurrence risk. Although the chi-square test for recurrence between the groups with and without complications did not reach significance ($p = 0.1$), univariate logistic regression revealed a significant association (OR, 43.26; $p = 0.039$). This discrepancy may reflect the greater sensitivity of logistic regression in detecting associations within small sample sizes and low event rates. Logistic models estimate outcome probabilities based on covariates, providing more re-

financed insights even when absolute group differences appear modest. Thus, even infrequent postoperative complications emerged as a significant predictor of recurrence in our cohort.

Patient satisfaction is another critical endpoint that appears to be closely tied to complication status. Bruscianno et al. noted that even minor postoperative discomforts — such as short-term bleeding or temporary urinary issues — can negatively influence a patient's perception of the overall treatment experience, regardless of the objective clinical success.²⁷ The present study further substantiates this association, showing a 24% decrease in satisfaction among patients who experienced complications. This underscores the importance of considering both subjective and objective outcomes in treatment efficacy evaluations.

Despite the popularity of laser-based techniques owing to their minimally invasive nature, faster recovery, and reduced postoperative pain compared with conventional methods, such as Milligan–Morgan or Ferguson hemorrhoidectomy, the evidence on their long-term efficacy remains mixed. A randomized trial by Salfi et al. found comparable recurrence rates between LHP and traditional hemorrhoidectomy after 1 year, despite better short-term tolerance in the laser group.²⁸ In a recent systematic review, Shreya et al. highlighted variability in recurrence rates depending on surgical expertise, laser parameters, and perioperative care protocols.²⁹ These studies have suggested that although LHP offers several perioperative advantages, it is not free of complications that can compromise long-term success.

This study has several limitations. First, its retrospective single-center design may limit the generalizability of the findings. Second, the relatively small sample size, particularly within the complication subgroup, may have reduced the statistical power to detect subtle yet clinically meaningful differences. Third, potential confounders, such as bowel habits, dietary patterns, or surgeon experience, were not evaluated, which may have influenced outcomes. Fourth, long-term results were assessed via telephone interviews using PROM-HISS, which could introduce recall bias or underreporting. Lastly, this study did not include a direct comparison with conventional hemorrhoidec-

tomy techniques, such as Milligan–Morgan or Ferguson procedures. Currently, the use of LHP combined with wedge resection, according to the existing expert consensus on best clinical practice for LHP management,³⁰ is considered a feasible approach. However, no dedicated studies have specifically investigated this combined technique. This study aimed to retrospectively review the experience of a single hospital and a single surgeon, providing preliminary clinical data on the safety and short-term outcomes of this hybrid minimally invasive procedure. Nonetheless, its long-term efficacy compared with conventional hemorrhoidectomy still requires further supporting evidence. We also plan to expand the sample size in the future and include patients undergoing conventional hemorrhoidectomy for direct comparison. In this study, patients with and without postoperative complications were compared to determine whether specific clinical characteristics could help identify high-risk individuals preoperatively. Prompt identification of such high-risk patients may help in refining surgical decision-making, enhancing perioperative care strategies, and ultimately preventing complications.

Conclusion

This study demonstrates that postoperative complications are significantly associated with higher recurrence rates and lower patient satisfaction following LHP combined with wedge resection. Although the majority of patients experienced favorable outcomes, those who experienced complications were more likely to require re-interventions and report lower treatment satisfaction. These findings underscore the critical role of preventing early postoperative complications in ensuring long-term surgical success and optimizing patient experience.

LHP remains a safe and minimally invasive treatment option for symptomatic hemorrhoidal disease, particularly suitable for patients seeking rapid recovery and reduced postoperative discomfort. To further enhance clinical outcomes and patient-centered results, future studies should focus on identifying modifiable risk factors — such as age, physiological status, BMI,

or intraoperative technical variables — and developing standardized perioperative care protocols.

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Appendix A

PROM-HISS: Hemorrhoid Impact and Satisfaction Questionnaire

Section 1: Symptoms in the Past Week

Please indicate to what extent you have experienced the following complaints in the past 7 days.

Symptom	Not at all (0)	Mild (1-3)	Moderate (4-6)	Severe (7-9)	Very severe (10)
Pain during defecation	()	()	()	()	()
Itching in the anal area	()	()	()	()	()
Bleeding	()	()	()	()	()
Soiling (leakage)	()	()	()	()	()
Prolapse (bulging hemorrhoids)	()	()	()	()	()

Section 2: Daily Life Impact

To what extent have the above complaints interfered with your daily activities (e.g., personal care, caregiving, housework, work, or sports) in the past week?

No interference (0) Slight (1-3) Moderate (4-6) Severe (7-9) Very severe (10)

() () () () ()

Section 3: Satisfaction with Treatment Result

If you recently underwent treatment in the hospital (e.g., rubber band ligation or surgery), how satisfied are you with the result regarding symptom reduction?

Not satisfied at all (0) Slightly (1-3) Moderately (4-6) Very (7-9) Completely satisfied (10)

() () () () ()

[] Not applicable - I have not been treated in the hospital.

Thank you for your participation!

原 著

雷射痔瘡整形術合併楔形切除之療效與安全性：回溯性世代研究

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背景 雷射痔瘡成形術 (laser hemorrhoidoplasty, LHP) 結合楔形切除術已成為治療症狀性痔瘡的一種微創方法。然而，術後併發症對臨床結果的影響仍缺乏探討。

方法 本回溯性世代研究納入 2022 年 4 月至 2023 年 4 月間接受 LHP 合併楔形切除術治療，依 BPRST 分期 (出血、脫垂、復位、皮膚贅生及血栓) 為第 II 或 III 期之 73 位痔瘡患者。依術後是否發生併發症分為併發症組與無併發症組，並於至少 24 個月追蹤期間分析臨床參數、復發率及病人滿意度，滿意度評估採用病人回報之 PROM-HISS (patient-reported outcome measure-hemorrhoidal impact and satisfaction score) 量表。統計分析方法包括 Mann-Whitney U 檢定、卡方檢定或費雪確切檢定，以及單變量邏輯斯迴歸分析。

結果 共 12 位患者 (16.4%) 發生術後併發症，最常見為出血 (I 級) 及尿滯留 (II-IIIa 級)。兩組在基線特徵與術中雷射能量上無顯著差異。然而，併發症組的復發率較高 (28.6% 對 5%, $p = 0.1$)，滿意度較低 (71.4% 對 95%)。邏輯斯迴歸分析顯示，術後併發症為唯一顯著的復發預測因子 (勝算比 43.26；95% 信賴區間 1.20-1566.64； $p = 0.03$)。

結論 LHP 合併楔形切除術後，即使為輕微的併發症，也與較高的復發率及較低的病人滿意度顯著相關。本研究結果強調，精細的手術技術與嚴密的術後追蹤對於優化長期治療結果的重要性。

關鍵詞 痔瘡、雷射痔瘡成形術、楔形切除術、術後併發症、復發、病人滿意度。