

Endoscopic Sclerotherapy and Cerclage Hemostasis for Variceal and Hemorrhoidal Bleeding Efficacy and Safety Outcomes

Liping Zhang MM

Department gastroenterology, The Third People's Hospital of Bengbu, Anhui province, Bengbu, 233000, China

Objective: This study aimed to compare the efficacy and safety of endoscopic sclerotherapy and cerclage hemostasis in the treatment of bleeding from varicose veins and hemorrhoids.

Methods: A total of 80 patients with bleeding varices and hemorrhoids were recruited and randomly divided into an endoscopic sclerotherapy group and a cerclage hemostasis group, with 40 people in each group. The endoscopic sclerotherapy group was treated with endoscopic injection of sclerotherapy, and the cerclage hemostasis group was treated with cerclage technique for hemostasis. The observation indicators included hemostatic effect, postoperative complications, recurrence rate of bleeding, pain relief and patient satisfaction.

Results: In terms of hemostatic effect, the total effective rates of the endoscopic sclerotherapy group and the cerclage hemostasis group were 85% and 90%, respectively, and there was no significant difference between the two groups ($P > 0.05$). In terms of postoperative complications, no serious complications occurred in the two groups. The recurrence rate of bleeding was 10% in the endoscopic sclerotherapy group and 7.5% in the cerclage hemostasis group, the difference was not significant ($P > 0.05$). In terms of pain relief, the endoscopic sclerotherapy group was significantly better than the cerclage hemostasis group ($P < 0.05$). In terms of patient satisfaction, both groups had high patient satisfaction, but the endoscopic sclerotherapy group was slightly higher than the cerclage hemostasis group.

Conclusion: Both endoscopic sclerotherapy and cerclage hemostasis have shown good efficacy and safety in the treatment of varicose veins and bleeding hemorrhoids. Hemostasis and bleeding recurrence rates were similar between the two approaches, but endoscopic sclerotherapy had an advantage in terms of pain relief. Taking patient satisfaction and pain relief into account, endoscopic sclerotherapy may be an effective treatment option.

Key words: endoscopic sclerotherapy, cerclage hemostasis, hemorrhoids, bleeding, varicose veins

Introduction

Varicose veins and hemorrhoids are common anorectal diseases, and their bleeding symptoms often cause patients suffering, seriously affecting their quality of life and daily activities [1-3]. The incidence of these diseases is quite high worldwide,

especially among adults. Fortunately, however, the medical field has provided a variety of treatments to help alleviate these problems and reduce discomfort and distress for patients. When treating these bleeding problems, physicians and patients often have to choose between various treatment options [4-5]. The choice is not easy, as each treatment has its specific strengths and limitations. Therefore, when determining the most suitable treatment plan, multiple factors need to be considered comprehensively, such as efficacy, safety, individual differences in patients, and severity of the disease [6-7]. Various treatments exist for bleeding from varicose veins and hemorrhoids, including endoscopic sclerotherapy and cerclage. Endoscopic sclerotherapy achieves hemostasis by promoting adhesion and occlusion of abnormal blood vessels, and its minimally invasive and relatively less postoperative pain has attracted much attention [8]. The cerclage hemostasis is a commonly used method for the treatment of hemorrhoids bleeding, and it has won a certain reputation for its simplicity and low bleeding recurrence rate. Regardless of the treatment chosen, balancing efficacy and safety is key [9-11]. The different stages of the disease and the individual circumstances of the patient may also affect the final choice of treatment options [12]. Therefore, it is very important to have sufficient communication and joint decision-making between doctors and patients. In addition, follow-up and effect evaluation after treatment are also related to the success of treatment.

Bleeding symptoms from varicose veins and hemorrhoids negatively impact the patient's health and quality of life [13-14]. While a variety of treatment options exist, choosing the most appropriate treatment option requires a combination of factors. Under the professional guidance of doctors, patients can make informed decisions based on their conditions and personal needs in order to obtain the best treatment effect. Endoscopic sclerotherapy, a minimally invasive treatment, has been widely used in the treatment of a variety of conditions, including varicose veins and bleeding hemorrhoids [15-16]. This method uses endoscopic positioning and injection of sclerosing agent to promote the occlusion of the diseased blood vessels, thereby achieving the effect of hemostasis. Endoscopic sclerotherapy has the advantages of simple operation, less trauma, and quick recovery [17]. However, its performance in terms of long-term efficacy and safety needs further study. At the same time, cerclage hemostasis, as another commonly used treatment method, tightly wraps veins or hemorrhoids through cerclage technology to achieve the purpose of hemostasis [18]. This method is simple to operate and the effect is relatively stable, but there are certain problems in terms of postoperative pain and recurrence of bleeding.

Despite the unique advantages of endoscopic sclerotherapy and cerclage in the treatment of bleeding from varices and hemorrhoids, comparative studies on the efficacy and safety of these two methods are limited. Therefore, this study aims to provide more comprehensive information for clinical decision-making by comparing the efficacy and safety results of endoscopic sclerotherapy and cerclage hemostasis, so as to better guide the judgment of doctors and patients in treatment selection. We

will focus on key indicators such as hemostatic effect, postoperative complications, recurrence rate of bleeding, pain relief and patient satisfaction, and expect to contribute substantial data support to optimize the treatment plan for varicose veins and hemorrhoid bleeding through this study.

Materials and Methods

Subject recruitment

Eighty patients aged 18-84 years with bleeding from hemorrhoids were recruited from outpatient and inpatient settings. According to the random number table method, they were randomly divided into two groups: endoscopic sclerotherapy group and cerclage hemostasis group, with 40 people in each group. The general data of the two groups of patients are shown in Table 1.

Table 1: Comparison of general information between the two groups

Group	Cerclage Hemostasis	Sclerotherapy	p
Gender(Male/Female)	19/21	20/20	
Age (years)	54.60±14.15	51.63±12.35	>0.05
BMI	22.23±1.17	22.31±1.37	

Inclusion criteria

Patient inclusion criteria: aged between 18 and 84 years; suffering from bleeding symptoms caused by clearly diagnosed varices and/or hemorrhoids; patients voluntarily participated in the study and signed an informed consent form; no obvious active infection or other serious complications; Physical condition suitable for endoscopic sclerotherapy or cerclage hemostasis. Patient exclusion criteria: pregnant or breastfeeding women, patients with severe organ dysfunction such as heart, liver, kidney or immune system; patients with bleeding disorders or abnormal coagulation function;

Patients who have received similar treatment or surgery; patients with serious psychological resistance to endoscopy or surgery; Patients unable to complete study-related follow-up and data collection.

Treatment method

Before operation, routine intestinal cleaning was performed, fasting for 8 hours and water prohibition for 4 hours. The surgical position was left side lying position.

Endoscopic sclerotherapy group: Patients receive endoscopic positioning and inject sclerosing agents (Lauromacrogol) to shrink varicose veins and hemorrhoid lesions and achieve hemostasis. Before operation, routine intestinal cleaning was performed,

fasting for 8 hours and water prohibition for 4 hours. The surgical position was left side lying position. Doctors use the electronic colonoscope to insert a lens into the patient's rectum to locate bleeding lesions; After a colonoscope with a transparent cap exposed the internal hemorrhoidal nucleus, the endoscopic injection needle was inserted, the injection needle was extended, and the base of the hemorrhoidal nucleus was directly pierced, and the sclerosing agent (0.1% lauryl glycol) was slowly injected, generally 0.5-2ml at each point, and the needle was withdrawn after stopping for more than 10s after each point of injection, which could effectively reduce the bleeding at the injection point. Guided by the endoscope, the doctor injects the sclerosing agent into the blood vessels of varicose veins or hemorrhoids. The role of the sclerosing agent is to induce inflammation of the vascular intima, promote the adhesion and occlusion of the vascular wall, and achieve the effect of hemostasis; the doctor will observe the changes of the bleeding lesion during the injection of the sclerosing agent, and make adjustments as needed to ensure that the sclerosing agent is fully covered and treated abnormal blood vessels. After the sclerosing agent injection is done, the doctor slowly removes the endoscope from the rectum. Patients usually need to be observed for a period of time after surgery to ensure that there are no significant complications or discomfort.

Cerclage hemostasis group: patients received cerclage hemostasis, and the bleeding vein or hemorrhoids were tightly wound through the cerclage technique to achieve hemostasis. The ligation device was installed on the electronic colonoscope, and the anus of the patient was lubricated and slowly inserted into the endoscope. The rectointestinal tube was expanded during gas injection, and the specific position of the hemorrhoidal core and dentate line was checked. The transparent cap was placed at the front end of the colonoscope to make it contact with the hemorrhoidal mucosa at the ligation position, and the suction operation was performed until the field of vision of the internal hemorrhoidal mucosa was completely visible in the transparent cap, and the ligation device was continuously attracted and rotated clockwise. After the rubber ring is completely released, the suction is stopped, and the lashing ring is sent out of the transparent cap through air injection. The operation is finished after repeated above-mentioned operation sequence. After the cerclage procedure is complete, the doctor will observe the patient to make sure there are no significant complications. Patients are usually allowed to leave the operating room and receive follow-up care as recommended by their physicians.

Observation indicators

Hemostatic effect: Judging the therapeutic effect according to the cessation of bleeding within 24 hours after operation, including complete, partial or no hemostasis.

Postoperative complications: observe any adverse events after surgery, including infection, increased bleeding, etc. Bleeding recurrence rate: the proportion of recurrent bleeding within 3 months after operation. Pain relief: Pain severity score within 24 hours, 1 week, and 1 month after operation (VAS Pain Scale (Visual Analog Scale)): VAS is a straight line with a scale of 0 to 10. The corresponding scale is

marked to indicate the intensity of the pain. 0 means no pain and 10 means the most severe pain.). Patient Satisfaction: Questionnaire survey was used to evaluate patients' satisfaction with treatment effect and postoperative pain.

Statistical methods

The collected data were analyzed using SPSS (26.0) statistical software. For count data, chi-square test was used to compare the differences between two groups; for continuous data, independent sample t-test or nonparametric test was used for comparison. The results were expressed as mean ± standard deviation or percentage, and a P value less than 0.05 was considered statistically significant.

Result

Comparison of hemostatic effect

In the endoscopic sclerotherapy group, 80% of the bleeding was completely stopped, 5% of the bleeding was partially stopped, and 15% of the non-stop bleeding; in the cerclage hemostasis group, the bleeding was completely stopped The proportion was 85%, the proportion of partially stopped bleeding was 10%, and the proportion of non-stopped bleeding was 5%. There was no significant difference in hemostatic effect between the two groups ($P > 0.05$) (Table 2) .

Table 2: Comparison of hemostatic effect between the two groups

Group	Complete hemostasis	Partial hemostasis	Failure to stop bleeding	p
Cerclage Hemostasis	32	4	4	>0.05
Sclerotherapy	34	4	2	

Comparison of Postoperative Complications

No serious complications occurred in the two groups, such as infection and increased bleeding. Two patients in the endoscopic sclerotherapy group had mild anal discomfort, and one patient in the cerclage hemostasis group had mild anal pain after operation. There was no significant difference in the incidence of postoperative complications between the two groups ($P > 0.05$). In the endoscopic sclerotherapy group, the bleeding recurrence rate within 3 months after surgery was 10%; in the cerclage hemostasis group, the bleeding recurrence rate was 7.5%. There was no significant difference in bleeding recurrence rate between the two groups ($P > 0.05$)

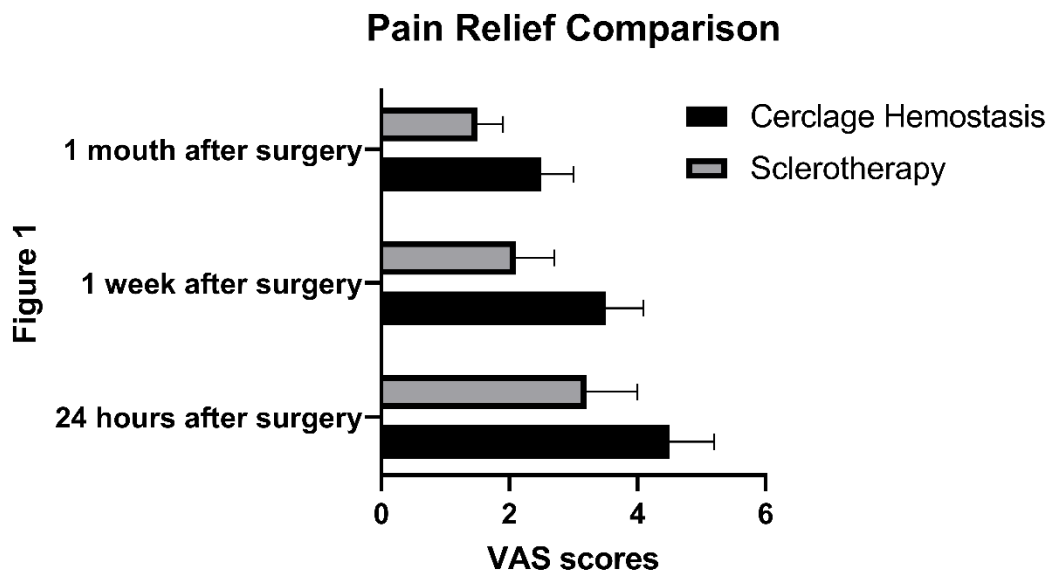
(Table 3) .

Table 3: Comparison of postoperative complications between the two groups

Group	Slight discomfort	Anal pain	Recurrence of bleeding	p
Cerclage Hemostasis	2	1	3	<0.05
Sclerotherapy	1	0	1	

Pain Relief Comparison

The pain scores in the endoscopic sclerotherapy group at 24 hours, 1 week, and 1 month after surgery were 3.2 ± 0.8 , 2.1 ± 0.6 , 1.5 ± 0.4 , which were significantly lower than those in the cerclage group (respectively 4.5 ± 0.7 , 3.5 ± 0.6 , 2.3 ± 0.5 , $P < 0.05$) (Figure 1) .



Patient Satisfaction Comparison

In the endoscopic sclerotherapy group, satisfaction was 87.5%; in the cerclage hemostasis group, satisfaction was 80%. Patient satisfaction in the endoscopic sclerotherapy group was slightly higher than in the cerclage hemostasis group, but the difference was not significant ($P > 0.05$) (Table 4) .

Table 4: Comparison of patient satisfaction between the two groups

Group	Very	Basically satisfied	Unsatisfied	p

	satisfied			
Cerclage Hemostasis	33	4	3	<0.05
Sclerotherapy	36	3	1	

Discussion

Endoscopic sclerotherapy, a minimally invasive treatment, has been used in the treatment of a variety of conditions, including varicose veins and bleeding hemorrhoids. Its advantages include less surgical trauma, faster recovery, and it can be performed in outpatient or day surgery [19]. Studies have shown that endoscopic sclerotherapy is more effective in hemostasis in the treatment of bleeding varices and hemorrhoids, with relatively few postoperative complications [20-21]. However, its long-term efficacy and applicability to different patient populations require further study [22]. Cerclage hemostasis is a common method for treating bleeding hemorrhoids [23]. Its principle is to block the blood supply through a rubber ring placed at the base of hemorrhoids, so as to achieve hemostatic effect. Studies have shown that cerclage hemostasis has a higher cure rate and a lower bleeding recurrence rate, and is suitable for patients with mild to moderate hemorrhoids [24-25]. However, some patients may experience postoperative discomfort or mild pain, but these adverse events are usually transient.

Limited comparative studies have shown that endoscopic sclerotherapy and cerclage hemostasis are equally effective in hemostasis and can effectively control bleeding symptoms. Some studies have also shown that endoscopic sclerotherapy is superior to cerclage hemostasis in terms of postoperative pain relief, which may be related to the minimally invasive nature of endoscopic sclerotherapy. However, there may be some differences in the results of different studies, because factors such as case selection, operation technique, and follow-up time may affect the research results. In general, endoscopic sclerotherapy and cerclage hemostasis are commonly used methods for the treatment of bleeding from varicose veins and hemorrhoids, with their own advantages and scope of application. When choosing a treatment method, doctors should comprehensively consider the patient's condition, preference, and clinical practice experience in order to achieve the best therapeutic effect.

In terms of hemostatic effect, there was no significant difference between the endoscopic sclerotherapy group and the cerclage hemostasis group in the proportions of complete, partial and non-stop bleeding. This suggests that both methods have similar efficacy in hemostasis, and both are effective in controlling bleeding symptoms from varicose veins and hemorrhoids. This is consistent with previous findings and reinforces the effectiveness of endoscopic sclerotherapy and cerclage hemostasis in the management of bleeding. With regard to postoperative

complications, no serious complications occurred in the two groups, indicating that both endoscopic sclerotherapy and cerclage hemostasis are acceptable in terms of safety. Although a small number of patients in the endoscopic sclerotherapy group experienced mild anal discomfort and one patient in the cerclage group experienced mild anal pain, these complications are not uncommon in clinical practice and tend to be transient. The difference between the two groups was not significant in the rate of bleeding recurrence, which means that endoscopic sclerotherapy and cerclage were similarly effective in preventing bleeding recurrence. However, long-term follow-up may provide further insight into the ongoing efficacy of both approaches. In terms of pain relief, the endoscopic sclerotherapy group was significantly better than the cerclage hemostasis group, which may be related to the minimally invasive nature of endoscopic sclerotherapy, which can less disturb the tissues around the anus, thereby reducing the pain perception of patients. This also suggests that in patients concerned about pain relief, endoscopic sclerotherapy may be a more appropriate treatment option. Regarding patient satisfaction, although satisfaction was slightly higher in the endoscopic sclerotherapy group than in the cerclage hemostasis group, the difference between the two groups was not significant. This may be related to slight differences in treatment effects and postoperative discomfort. However, the evaluation of satisfaction is affected by individual subjective factors, so we need a larger sample of research to further verify this conclusion.

Based on the above discussion, endoscopic sclerotherapy and cerclage hemostasis have shown good efficacy and safety in the treatment of bleeding from varicose veins and hemorrhoids. Although hemostasis was similar between the two approaches, endoscopic sclerotherapy had an advantage in terms of pain relief. Therefore, clinicians can choose the appropriate method according to the individual conditions and preferences of patients when formulating treatment plans. In addition, this study has some limitations, such as small sample size and relatively short follow-up time, and larger studies can be conducted in the future to further verify these results.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

LPZ conducted the experiments. LPZ participated in the sequence alignment. LPZ participated in the design of the study and performed the statistical analysis. LPZ conceived of the study, and participated in its design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

Consent for publication

Not applicable.

Ethics approval and consent to participate

The present study was approved by the Institutional Animal Care and Use Committee of The The Third People's Hospital of Bengbu Consent for publication Not applicable.

Conflict of interest

declare that they have no conflict of interest

References

- [1] Ng KS, Holzgang M, Young C. Still a Case of "No Pain, No Gain"? An Updated and Critical Review of the Pathogenesis, Diagnosis, and Management Options for Hemorrhoids in 2020. *Ann Coloproctol*. 2020 Jun;36(3):133-147. doi: 10.3393/ac.2020.05.04. Epub 2020 Jun 30. PMID: 32674545; PMCID: PMC7392573.
- [2] Patel J, McKechnie T, Wu K, Sharma S, Lee Y, Doumouras A, Hong D, Eskicioglu C. HEmoRhoidal disease management with Band ligation versus polidocanol Sclerotherapy: a systematic review and meta-analysis (the HerBS Review). *Int J Colorectal Dis*. 2023 May 3;38(1):112. doi: 10.1007/s00384-023-04394-w. PMID: 37133577.
- [3] Pata F, Bracchitta LM, D'Ambrosio G, Bracchitta S. Sclerobanding (Combined Rubber Band Ligation with 3% Polidocanol Foam Sclerotherapy) for the Treatment of Second- and Third-Degree Hemorrhoidal Disease: Feasibility and Short-Term Outcomes. *J Clin Med*. 2021 Dec 31;11(1):218. doi: 10.3390/jcm11010218. Erratum in: *J Clin Med*. 2023 Aug 07;12(15): PMID: 35011962; PMCID: PMC8745462.
- [4] Tutino R, Massani M, Jospin Kamdem Mambou L, Venturelli P, Della Valle I, Melfa G, Micheli M, Russo G, Scerrino G, Bonventre S, Cocorullo G. A Stepwise Proposal for Low-Grade Hemorrhoidal Disease: Injection Sclerotherapy as a First-Line Treatment and Rubber Band Ligation for Persistent Relapses. *Front Surg*. 2022 Jan 10;8:782800. doi: 10.3389/fsurg.2021.782800. PMID: 35083270; PMCID: PMC8784409.
- [5] Huang DD, Liu ZM, Zhang D, Hu B, Su D, Zhang H, Ren DL. [Analysis on clinical efficacy, safety and economy of Shaobei injection and elastic band ligation in the treatment of grade II or III hemorrhoids]. *Zhonghua Wei Chang Wai Ke Za Zhi*. 2020 Dec 25;23(12):1194-1199. Chinese. doi: 10.3760/cma.j.cn.441530-20200526-00312. PMID: 33353276.
- [6] Kodilinye SM, Kalloo AN. Endoscopic approaches to the management of hemorrhoids. *Curr Opin Gastroenterol*. 2023 Sep 1;39(5):375-380. doi: 10.1097/MOG.0000000000000960. Epub 2023 Jun 21. PMID: 37389425.
- [7] Ma W, Guo J, Yang F, Dietrich CF, Sun S. Progress in Endoscopic Treatment of Hemorrhoids. *J Transl Int Med*. 2020 Dec 31;8(4):237-244. doi: 10.2478/jtim-2020-0036. PMID: 33511050; PMCID: PMC7805292.
- [8] Miyamoto H. Minimally Invasive Treatment for Advanced Hemorrhoids. *J Anus Rectum Colon*. 2023 Jan 25;7(1):8-16. doi: 10.23922/jarc.2022-068. PMID: 36743466; PMCID: PMC9876604.
- [9] Demetiou G, Augoustaki A, Kalaitzakis E. Endoscopic management and outcome

of non-variceal bleeding in patients with liver cirrhosis: A systematic review. *World J Gastrointest Endosc.* 2022 Mar 16;14(3):163-175. doi: 10.4253/wjge.v14.i3.163.

PMID: 35432740; PMCID: PMC8984531.

[10] Tutino R, Salamone G, De Marco P, Cocorullo G, Gulotta G. Outpatient Treatment of Hemorrhoidal Disease: The Alternative Way to Treat Hemorrhoidal Disease in a Simple, Safe and Effective Manner. *Rev Recent Clin Trials.*

2021;16(1):5-9. doi: 10.2174/1574887115666200305150029. PMID: 32133966.

[11] Jin L, Yang H, Qin K, Li Y, Cui C, Wu R, Wang Z, Wu J. Efficacy of modified rubber band ligation in the treatment of grade III internal hemorrhoids. *Ann Palliat Med.* 2021 Feb;10(2):1191-1197. doi: 10.21037/apm-19-657. Epub 2020 Oct 12.

PMID: 33081476.

[12] Ng KS, Holzgang M, Young C. Still a Case of "No Pain, No Gain"? An Updated and Critical Review of the Pathogenesis, Diagnosis, and Management Options for Hemorrhoids in 2020. *Ann Coloproctol.* 2020 Jun;36(3):133-147. doi:

10.3393/ac.2020.05.04. Epub 2020 Jun 30. PMID: 32674545; PMCID: PMC7392573.

[13] McKeown DG, Goldstein S. Hemorrhoid Banding. 2023 May 14. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. PMID: 32644393.

[14] Lew FH, Ailabouni LD. Rubber Band Ligation of Internal Hemorrhoids. *Dis Colon Rectum.* 2023 Jun 22. doi: 10.1097/DCR.0000000000002578. Epub ahead of print. PMID: 37378585.

[15] Stavrou G, Tzikos G, Malliou P, Panidis S, Kotzampassi K. Rubber band ligation of hemorrhoids: is the procedure effective for the immunocompromised, hemophiliacs and pregnant women? *Ann Gastroenterol.* 2022 Sep-Oct;35(5):509-513. doi:

10.20524/aog.2022.0737. Epub 2022 Jul 15. PMID: 36061152; PMCID:

PMC9399576.

[16] Patel J, McKechnie T, Wu K, Sharma S, Lee Y, Doumouras A, Hong D,

Eskicioglu C. HEMORRHOIDAL disease management with Band ligation versus

polidocanol Sclerotherapy: a systematic review and meta-analysis (the HerBS

Review). *Int J Colorectal Dis.* 2023 May 3;38(1):112. doi: 10.1007/s00384-023-

04394-w. PMID: 37133577.

[17] Longchamp G, Liot E, Meyer J, Toso C, Buchs NC, Ris F. Non-excisional laser therapies for hemorrhoidal disease: a systematic review of the literature. *Lasers Med Sci.* 2021 Apr;36(3):485-496. doi: 10.1007/s10103-020-03142-8. Epub 2020 Sep 10.

PMID: 32914275; PMCID: PMC7952353.

[18] Komporozos V, Ziozia V, Komporozou A, Stravodimos G, Kolinioti A,

Papazoglou A. Rubber band ligation of symptomatic hemorrhoids: an old solution to an everyday problem. *Int J Colorectal Dis.* 2021 Aug;36(8):1723-1729. doi:

10.1007/s00384-021-03900-2. Epub 2021 Mar 10. PMID: 33751210.

[19] Yu J, Zhong J, Peng T, Jin L, Shen L, Yang M. Modified rubber band ligation for treatment of grade II/III hemorrhoids: clinical efficacy and safety evaluation-a retrospective study. *BMC Surg.* 2022 Jun 20;22(1):238. doi: 10.1186/s12893-022-

01688-8. PMID: 35725452; PMCID: PMC9210638.

[20] De Robles MS, Young CJ. Rubber Band Ligation of Hemorrhoids is often a

- Necessary Complement in the Management of Hemorrhagic Radiation Proctitis. *Scand J Surg.* 2020 Jun;109(2):108-114. doi: 10.1177/1457496918822619. Epub 2019 Jan 11. PMID: 30632450.
- [21] Huang DD, Liu ZM, Zhang D, Hu B, Su D, Zhang H, Ren DL. [Analysis on clinical efficacy, safety and economy of Shaobei injection and elastic band ligation in the treatment of grade II or III hemorrhoids]. *Zhonghua Wei Chang Wai Ke Za Zhi.* 2020 Dec 25;23(12):1194-1199. Chinese. doi: 10.3760/cma.j.cn.441530-20200526-00312. PMID: 33353276.
- [22] De Nardi P, Maggi G, Pagnanelli M, Vlasakov I, Corbetta D. Hemorrhoid laser dearterialization: systematic review and meta-analysis. *Lasers Med Sci.* 2023 Jan 25;38(1):54. doi: 10.1007/s10103-022-03703-z. PMID: 36695928.
- [23] Kodilinye SM, Kalloo AN. Endoscopic approaches to the management of hemorrhoids. *Curr Opin Gastroenterol.* 2023 Sep 1;39(5):375-380. doi: 10.1097/MOG.0000000000000960. Epub 2023 Jun 21. PMID: 37389425.
- [24] Kang DW, Kim BS, Kim JH, Kim KR, Kang GS. A comparative study of rubber band ligation versus BANANA-Clip in grade 1 to 3 internal hemorrhoids. *Ann Coloproctol.* 2023 Feb;39(1):41-49. doi: 10.3393/ac.2021.00717.0102. Epub 2021 Dec 9. PMID: 34879637; PMCID: PMC10009063.
- [25] Pata F, Bracchitta LM, D'Ambrosio G, Bracchitta S. Sclerobanding (Combined Rubber Band Ligation with 3% Polidocanol Foam Sclerotherapy) for the Treatment of Second- and Third-Degree Hemorrhoidal Disease: Feasibility and Short-Term Outcomes. *J Clin Med.* 2021 Dec 31;11(1):218. doi: 10.3390/jcm11010218. Erratum in: *J Clin Med.* 2023 Aug 07;12(15): PMID: 35011962; PMCID: PMC8745462.

Corresponding Author:

Liping Zhang MM

Department gastroenterology, The Third People's Hospital of Bengbu, Anhui

province, Bengbu,233000, China

TEL: 8618155227067

E-mail: m18155227067@163.com