

Application Status and Consensus on Injection Therapy for Hemorrhoids in China: A Cross-sectional Study Postprint

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Abstract

Background Hemorrhoids are common diseases in anorectal surgery. Injection therapy is a commonly used treatment method, but currently there is a lack of national data regarding the depth of application and standardized usage of injection therapy. Therefore, it is necessary to conduct this survey research.

Objective To investigate the current depth and breadth of hemorrhoid injection therapy implementation in China, its standardized application, efficacy and safety, and reasons for non-implementation.

Methods An online questionnaire was distributed to members of the Professional Committee of Colorectal and Anal Diseases of the China Medicine Education Association from July to November 2022. The questionnaire was self-designed with 37 questions, including demographic data, hemorrhoid treatment methods, application of injection therapy, complications, etc. SPSS 21.0 software was used for statistical analysis.

Results A total of 335 questionnaires were collected, with 312 valid questionnaires (response rate 93.1%). 293 (93.9%) doctors used sclerotherapy injection, and 153 (54.2%) doctors performed more than 500 cases of injection therapy. There was no statistically significant difference in the number of injection therapies performed by anorectal doctors across different hospital levels, hospital types, and hospital categories ($P > 0.05$). 293 (93.9%) and 263 (84.3%) doctors believed that injection therapy was suitable for treating internal hemorrhoids and the internal hemorrhoid component of mixed hemorrhoids. For grade I and II internal hemorrhoids, the proportion of sclerotherapy was 55.4% (173/312) and 79.2% (247/312) respectively. For anesthesia methods, local anesthesia (229 cases, 73.4%) and spinal anesthesia (145 cases, 46.5%) were the main choices. 280 (89.7%) had used Xiaozhiling injection, ranking first among sclerosants; 201

(64.4%) chose to treat 3 hemorrhoids in a single session. For hemorrhoids in the anterior anal region, 140 (44.9%) doctors believed they could be injected, while 172 (55.1%) doctors believed they should not be injected with sclerosant. Dosage analysis showed that single-site Xiaozhiling injection was concentrated at 1-5 mL, accounting for 80.7% (92 doctors), and low-dose (0-3 mL) regimen accounted for 56.7% (59/104). Although 233 (74.7%) recognized the curative effect of injection alone, 227 (88.8%) still combined it with surgical procedures in clinical practice, with hemorrhoidectomy accounting for 64.7% (202/312). The 1-year recurrence rate of injection alone was assessed as <10% by 90.3% (233/258) of doctors, but the 5-year assessment decreased to 58.9% (146/248). Complication rates in patients receiving injection therapy showed: anal pain 134 cases (42.9%), urinary retention 90 cases (28.8%), injection site induration 182 cases (58.3%) as common adverse reactions. Other serious complications included perianal abscess (5.1%, 16 cases), sepsis (1.3%, 4 cases), and rectal perforation (1.6%, 5 cases). The main reasons for not implementing injection therapy were: 15 (35.7%) considered hospital management factors, 9 (21.4%) considered price issues, 8 (19.0%) questioned efficacy, and 6 (14.3%) considered drug shortage.

Conclusion Hemorrhoid injection therapy has been widely recognized and applied by anorectal doctors in China, with 93.9% of doctors implementing this therapy, and over 54.2% having performed more than 500 cases, with no significant difference in popularity across various levels and types of hospitals. At least 55.4% of doctors can properly master the indications (grade I-II internal hemorrhoids are more likely to adopt injection therapy). Xiaozhiling is the most commonly used sclerosant, with multiple hemorrhoids (3 sites) injected in one session. Hemorrhoid injection therapy has definite efficacy, with 90% of doctors reporting a 1-year recurrence rate <10%, and long-term recurrence rate data supporting its reliability. Nearly 90% of doctors tend to combine it with other surgical procedures, reflecting insufficient confidence in injection alone. It is necessary to clarify the goal of instrumental therapy to “alleviate symptoms” and strengthen doctor-patient communication. As a safe and effective means of hemorrhoid management, hemorrhoid injection therapy is suitable for nationwide promotion, but standardized operation training and complication prevention and control system construction need to be strengthened.

Full Text

Current Status and Consensus on the Use of Injectable Treatment for Hemorrhoids in China: A Cross-sectional Study

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Abstract

Background

Hemorrhoids are among the most common anorectal diseases, and injection therapy represents a frequently employed treatment modality. However, comprehensive national data regarding the depth of application and standardized implementation of injection therapy remain scarce, necessitating this investigative study.

Objective

To investigate the depth and breadth of hemorrhoidal injection therapy implementation in China, its standardized application, effectiveness and safety, and the reasons for non-implementation.

Methods

An online questionnaire was distributed to members of the Professional Committee of Anorectal Diseases of the Chinese Association for Medical Education from July to November 2022. The self-designed questionnaire comprised 37 items covering demographic data, hemorrhoid treatment methods, injection therapy utilization, and complications. Statistical analysis was performed using SPSS 21.0 software.

Results

A total of 335 questionnaires were collected, yielding 312 valid questionnaires (93.1% response rate). Among respondents, 293 (93.9%) physicians used sclerotherapy injection, and 153 (54.2%) had performed over 500 injection procedures. No statistically significant differences were observed in the number of injection therapies performed across different hospital levels, ownership types, or categories ($P>0.05$). A total of 293 (93.9%) and 263 (84.3%) physicians considered injection therapy suitable for internal hemorrhoids and the internal

component of mixed hemorrhoids, respectively. For Grade I and II internal hemorrhoids, sclerotherapy accounted for 55.4% (173/312) and 79.2% (247/312) of treatment choices, respectively. Regarding anesthesia selection, local anesthesia was used in 229 cases (73.4%) and spinal anesthesia in 145 cases (46.5%). Xiaozhiling injection was used by 280 (89.7%) physicians, making it the most commonly used sclerosant. For the number of hemorrhoids treated in a single session, 201 (64.4%) physicians treated three hemorrhoids. For anterior anal hemorrhoids, 140 (44.9%) physicians considered injection appropriate, while 172 (55.1%) considered it inappropriate. Dosage analysis revealed that Xiaozhiling single-site injections concentrated at 1–5 mL (80.7%, 92 physicians), with low-dose (0–3 mL) regimens accounting for 56.7% (59/104). Although 233 (74.7%) acknowledged the curative potential of injection alone, 227 (88.8%) combined it with other procedures in clinical practice, with hemorrhoidectomy accounting for 64.7% (202/312). The one-year recurrence rate for injection alone was assessed as <10% by 90.3% (233/258) of physicians, but this decreased to 58.9% (146/248) at the five-year assessment. Complication rates included anal pain (134 cases, 42.9%), urinary retention (90 cases, 28.8%), and injection site induration (182 cases, 58.3%) as common adverse reactions. Serious complications included perianal abscess (5.1%, 16 cases), sepsis (1.3%, 4 cases), and rectal perforation (1.6%, 5 cases). Among reasons for not performing injection therapy, 15 (35.7%) cited hospital management factors, 9 (21.4%) cited pricing issues, 8 (19.0%) questioned efficacy, and 6 (14.3%) reported drug shortages.

Conclusion

Hemorrhoid injection therapy has gained widespread recognition and application among anorectal physicians in China, with 93.9% of physicians performing this therapy and over 54.2% having performed more than 500 cases, with no significant differences across hospital levels and types. At least 55.4% of physicians appropriately mastered the indications (Grades I–II internal hemorrhoids were more likely to receive injection therapy). Xiaozhiling is the most commonly used sclerosant, with three hemorrhoids typically injected in one session. Hemorrhoid injection therapy demonstrates definitive efficacy, with 90% of physicians reporting a one-year recurrence rate <10%, and long-term recurrence data supporting its reliability. Nearly 90% of physicians prefer combining injection with other procedures, reflecting insufficient confidence in injection alone and highlighting the need to clarify the “symptomatic relief” goal of device therapy and strengthen physician-patient communication. As a safe and effective hemorrhoid management modality, hemorrhoid injection therapy is suitable for nationwide promotion, but requires strengthened standardized operation training and complication prevention and control systems.

Keywords

Hemorrhoids; Injection therapy; Current application status; Sclerosants; Complications

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Introduction

Hemorrhoidal disease (HD) is a common and highly prevalent anorectal condition, with a reported prevalence of 49.14% among Chinese urban and rural residents. Among urban populations, the prevalence shows minimal variation between ages 25 and 64. Research indicates that 23.7% of patients receiving conservative treatment ultimately require non-conservative interventions. Contemporary patients, particularly younger individuals, increasingly prefer treatment modalities characterized by minimal trauma, reduced pain, and rapid recovery. Injection therapy offers simple operation, favorable safety profiles, minimal postoperative anal pain and discomfort, and can be performed in outpatient settings, thus meeting current patient demands. Most guidelines provide high-level recommendations for injection therapy in treating Goligher Grades I–III internal hemorrhoids.

The history of hemorrhoid injection therapy dates to 1869, when Morgan first reported successful cases using iron persulfate injection. In 1979, Andrews documented 3,000 cases treated with phenol in olive oil or glycerin mixtures. During the 1920s–1930s, injection therapy became a common treatment modality, with 5% phenol being the most widely used sclerosant, though quinine and other agents were also reported. The emergence of modified traditional techniques and new technologies—including rubber band ligation, hemorrhoidal artery ligation, and procedure for prolapse and hemorrhoids (PPH)—gradually reduced the application of injection therapy due to their favorable efficacy and reduced postoperative pain. In the 21st century, hemorrhoid surgery has evolved in two distinct directions: traditional techniques enhanced by new devices to improve efficacy, and minimally invasive technologies emphasizing minimal pain and trauma. The introduction of polidocanol foam as a sclerosant in 2007 injected new vitality into injection therapy.

China has achieved remarkable progress in hemorrhoid injection therapy based on traditional Chinese medicine principles. The Xiaozhiling injection was successfully developed between 1975–1977, and its novel therapy for internal hemorrhoids passed expert evaluation in 1979, with one study demonstrating 99% efficacy in 21,148 cases and a 3-year recurrence rate of 1%. In the early 1990s, Shaobei injection gained widespread application, and in 2006, Fantengzhi injection was successfully developed, contributing to the substantial advancement of hemorrhoid injection therapy in China. However, the early 21st century witnessed a temporary decline in injection therapy with the adoption of PPH and rubber band ligation techniques. In recent years, injection therapy has regained prominence due to patient demand for minimal pain and rapid recovery, accompanied by the publication of new guidelines and consensus statements. This study conducted a questionnaire survey among members of the Professional Committee of Anorectal Diseases of the Chinese Association for Medical Education to investigate the current application status of hemorrhoid injection therapy

in China and anorectal physicians' attitudes toward this treatment modality.

Methods

Study Participants

From July to November 2022, an online questionnaire was distributed to committee members of the Professional Committee of Anorectal Diseases of the Chinese Association for Medical Education. Inclusion criteria comprised: (1) anorectal specialists; (2) currently practicing; and (3) capable of independently completing the questionnaire. Exclusion criteria included: (1) no surgical practice within the past five years; (2) unwillingness to participate; and (3) psychiatric disorders.

Study Design

This cross-sectional study employed a self-designed questionnaire containing 37 items covering demographic data, hemorrhoid treatment methods, combination with other modalities, sclerotherapy utilization rates, and adverse reactions. The questionnaire was administered online via Wenjuanxing software to committee members. Internal hemorrhoid grading followed the Goligher classification system, which categorizes internal hemorrhoids into four grades: Grade I (bleeding without prolapse), Grade II (prolapse with spontaneous reduction), Grade III (prolapse requiring manual reduction), and Grade IV (irreducible prolapse). This study received approval from the Ethics Committee of Dongzhimen Hospital, Beijing University of Chinese Medicine (Ethics Approval No.: 2022DZMEC-302-01) and adhered to the principles of the Helsinki Declaration.

Statistical Analysis

Data processing was performed using SPSS 21.0 software. Normally distributed continuous data were expressed as mean \pm standard deviation, while non-normally distributed continuous data were presented as median (P25, P75). Categorical data were expressed as frequencies and percentages, with intergroup comparisons conducted using chi-square tests. Statistical significance was defined as $P < 0.05$.

Results

Demographic Characteristics

A total of 335 questionnaires were collected, yielding 312 valid questionnaires after excluding duplicates, for an effective response rate of 93.1%. Questionnaire completion times ranged from 225 to 3,860 seconds. All participants were anorectal specialists currently practicing or still engaged in anorectal work, representing 32 provinces, autonomous regions, and municipalities (excluding Hong Kong, Macau, and Taiwan). Demographic characteristics are presented in Table 1.

Depth and Breadth of Injection Therapy Application in China

Regarding hemorrhoid treatment, 101 (32.4%) physicians reported that approximately 1/10 of their patients received injection therapy, while 40 (12.8%), 36 (11.5%), and 67 (21.5%) physicians reported treatment rates of 1/5, 1/3, and 1/2, respectively. Forty-nine physicians (15.7%) applied injection therapy to all hemorrhoid patients, while 19 (6.1%) reported not currently performing injection therapy. Among 282 physicians who reported their injection therapy caseload, 51 (18.1%) had performed fewer than 100 cases, 78 (27.7%) had performed 100–500 cases, 28 (9.9%) had performed 500–1,000 cases, 95 (33.7%) had performed over 1,000 cases, and 30 (10.6%) had performed over 10,000 cases. No statistically significant differences were observed in injection therapy volumes across hospital levels, ownership types, or categories ($P > 0.05$), as shown in Table 2.

Standardization of Hemorrhoid Injection Therapy

Regarding sclerosant selection, 280 (89.7%) physicians had used Xiaozhiling injection, 70 (22.4%) had used Shaobei injection, 14 (4.5%) had used Fantengzhi injection, 46 (14.7%) had used polidocanol, 62 (19.9%) had used lauromacrogol, and 7 (2.2%) had used other sclerosants. No respondents reported using phenol. For the number of hemorrhoids treated per session, 3 (1.0%) physicians treated one hemorrhoid, 26 (8.3%) treated two, 201 (64.4%) treated three, 46 (14.7%) treated four, and 36 (11.5%) treated five. Regarding anterior anal hemorrhoids, 140 (44.9%) physicians considered injection appropriate, while 172 (55.1%) considered it inappropriate.

According to Goligher grading, physicians' treatment preferences for each hemorrhoid grade are detailed in Table 3. For Grade I internal hemorrhoids, conservative treatment was most frequently selected (281/312, 90.1%), followed by injection therapy (173/312, 55.4%). For Grade II internal hemorrhoids, sclerotherapy was most common (247/312, 79.2%), followed by conservative treatment (217/312, 69.6%). For Grade III internal hemorrhoids, excisional hemorrhoidectomy was most frequently chosen (275/312, 88.1%), followed by rubber band ligation (235/312, 75.3%) and injection therapy (222/312, 71.2%). For Grade IV internal hemorrhoids, excisional hemorrhoidectomy predominated (290/312, 92.9%), followed by rubber band ligation (208/312, 66.7%).

Regarding treatment setting, 97 (31.1%) physicians performed injection therapy in outpatient clinics, while others required hospitalization. For anesthesia selection, 75 (24.0%) physicians considered no anesthesia necessary, 229 (73.4%) used local anesthesia, 88 (28.2%) used epidural anesthesia, 145 (46.5%) used spinal anesthesia, 122 (39.1%) used sacral anesthesia, 48 (15.4%) used intravenous general anesthesia, and 9 (2.9%) used endotracheal general anesthesia.

Among 114 physicians who reported Xiaozhiling dosage per hemorrhoid, 2 (1.8%) injected 0.5 mL, 92 (80.7%) injected 1–5 mL, 13 (11.4%) injected 5–10 mL, 1 (0.9%) injected 15–20 mL, and 6 (5.3%) injected 20–60 mL. Among 104

physicians using Xiaozhiling, 59 (56.7%) selected 0–3 mL per site, 20 (19.2%) selected 3–5 mL, 19 (18.2%) selected 6–10 mL, and 6 (5.7%) selected 10–30 mL. Among 14 physicians using Shaobei injection, 10 (71.4%) injected 1–5 mL per hemorrhoid, 1 (7.1%) injected 10 mL, and 3 (21.4%) injected 20 mL. Among 10 physicians using polidocanol, 2 (20.0%) injected 0.2–1 mL, and 4 (40.0%) injected 1–4 mL. Among 13 physicians using lauromacrogol, 1 (7.7%) injected 0.5 mL, 8 (61.5%) injected 1–2 mL, and 4 (30.7%) injected 2–4 mL.

Efficacy and Safety of Injection Therapy

A total of 233 (74.7%) physicians believed that sclerotherapy alone could cure hemorrhoids, while 54 (17.3%) disagreed and 25 (8.0%) were uncertain. Only 35 (11.2%) physicians frequently used injection therapy alone, while 277 (88.8%) primarily combined injection with other procedures. The main combined procedures included rubber band ligation (85, 27.2%), hemorrhoidectomy (202, 64.7%), PPH (14, 4.5%), and other techniques (11, 3.5%). Table 4 presents physicians' assessments of recurrence rates following injection therapy alone. The proportion reporting recurrence rates <10% was 90.3% (233/258) at one year, 69.8% (176/252) at three years, and 58.9% (146/248) at five years.

Regarding complications, 134 (42.9%) physicians reported anal pain, 90 (28.8%) reported urinary retention, 55 (17.6%) reported fever, and 11 (3.5%) reported allergic reactions. Injection site ulceration was reported by 46 (14.7%) physicians, and injection site induration by 182 (58.3%). Serious complications included perianal abscess (16, 5.1%), anal fistula (4, 1.3%), necrotizing fasciitis (3, 1.0%), prostatic infection or abscess (2, 0.6%), pelvic/abdominal infection (4, 1.3%), and sepsis (4, 1.3%). Rectal perforation was reported by 5 (1.6%) physicians, rectovaginal fistula by 1 (0.3%), and rectourethral fistula by 1 (0.3%). Forty-three (13.8%) physicians reported other complications. Among the 5 physicians reporting pelvic/abdominal infection, 4 (80.0%) also reported rectal perforation, 3 (60.0%) reported necrotizing fasciitis, 3 (60.0%) reported sepsis, and 1 (20.0%) reported prostatic infection or abscess, rectovaginal fistula, or rectourethral fistula.

Reasons for Not Performing Injection Therapy

Forty-two physicians analyzed reasons for not performing hemorrhoid injection therapy. Eight (19.0%) cited poor efficacy, 15 (35.7%) cited hospital-related issues (such as self-payment requirements and lack of insurance coverage), 9 (21.4%) cited pricing concerns, 6 (14.3%) reported drug shortages, and 4 (9.5%) cited technical issues.

Discussion

This study represents a nationwide investigation conducted with support from the Professional Committee of Anorectal Diseases of the Chinese Association for Medical Education. The included participants encompassed 32 provinces,

autonomous regions, and municipalities (excluding Hong Kong, Macau, and Taiwan), with employment spanning all hospital levels from primary to tertiary, as well as public and private, traditional Chinese medicine and Western medicine institutions. This broad representation ensures that our findings reflect the national status of hemorrhoid injection therapy. The study examined four primary aspects: (1) the depth and breadth of hemorrhoid injection therapy implementation across China; (2) standardized application practices; (3) efficacy and safety; and (4) specific reasons for non-implementation.

Our results demonstrate that only 6.1% of anorectal physicians do not perform injection therapy, while over 54.2% have performed more than 500 cases, with no significant differences across hospital levels or types. This indicates widespread acceptance of injection therapy among physicians nationwide. The indications for injection therapy include conservative treatment-refractory Goligher Grades I-III internal hemorrhoids and Grade IV internal hemorrhoid patients unwilling to undergo surgery or with surgical contraindications. While the majority of physicians appropriately mastered these indications, a small minority considered injection suitable for external hemorrhoids, highlighting the need for enhanced education to standardize practice and protect patient interests.

The Goligher grading system serves as the primary tool for assessing internal hemorrhoid severity, with most guidelines using it to direct treatment. Survey data indicate that 63% of physicians base treatment decisions on Goligher grading. Treatment options include conservative therapy, device-based treatments (injection and rubber band ligation) or office procedures, and surgical interventions such as hemorrhoidectomy or PPH, with progressively increasing patient invasiveness. Current guidelines recommend conservative therapy as first-line for all internal hemorrhoid patients, followed by device-based (office) treatments. While device and surgical treatments show similar efficacy for Grade II hemorrhoids, device therapy carries lower complication rates, whereas surgery demonstrates superior efficacy for Grade III hemorrhoids. Studies comparing rubber band ligation with PPH for Grade III and mild Grade IV hemorrhoids show similar prolapse improvement, but higher recurrent bleeding rates with ligation and lower pain and procedure-related complications. Higher Goligher grades correlate with poorer device therapy outcomes compared to surgery, though device therapy produces less anal pain. Consequently, the American Society of Colon and Rectal Surgeons Clinical Practice Guidelines and the Chinese Hemorrhoid Diagnosis and Treatment Guidelines explicitly state that device therapy failures may proceed to surgical intervention.

Both injection and rubber band ligation represent minimally invasive, low-pain, effective, office-based device treatments. Although Western countries prefer rubber band ligation, studies demonstrate comparable efficacy and safety between the two modalities, with injection therapy producing less postoperative anal pain. This suggests hemorrhoid patients have compelling reasons to prefer injection therapy. The Chinese Expert Consensus on Hemorrhoid Injection Therapy (2023 Edition) recommends injection therapy as first-line for conservative

treatment-refractory Grades I-III internal hemorrhoids, with Grade IV hemorrhoids also being eligible. Given patient demands for rapid recovery, 96.7% of experts consider injection therapy suitable for day surgery. Our findings reflect Chinese anorectal physicians' consensus approach to Goligher grade-based treatment strategies: conservative therapy as foundation, with device therapy (preferring injection for Grades I-II and excisional hemorrhoidectomy for Grades III-IV) as appropriate.

At the operational level, this study demonstrates that injection therapy can be performed in outpatient settings without anesthesia, making it particularly suitable for day surgery. China offers more sclerosant options than Western countries, with Xiaozhiling being most widely used, followed by Shaobei, while Fantengzhi, lauromacrogol, and polidocanol are also utilized. Phenol, once widely used, is no longer employed by any surveyed physicians. Most physicians treat three hemorrhoids per session, while over half consider anterior anal hemorrhoids unsuitable for injection.

Efficacy data from respondents support the Chinese Expert Consensus recommendations. Over 90% of physicians reported one-year recurrence rates below 10%, nearly 70% reported three-year rates below 10%, and nearly 60% reported five-year rates below 10%, consistent with current literature. However, complication prevention requires continued attention. Injection site induration remains the most common complication, with intra-procedural massage to distribute medication evenly being key to prevention. Additionally, many patients experience acute post-procedure complications including anal pain, urinary retention, and allergic reactions, requiring physicians performing day-surgery injections to have appropriate management protocols. Although extremely safe, rare severe complications including rectal perforation, pelvic/abdominal infection, sepsis, rectovaginal fistula, and rectourethral fistula have been reported internationally, underscoring the need for cautious, standardized technique.

Despite over 70% of physicians believing in the efficacy of injection therapy alone, nearly 90% combine it with other procedures, possibly reflecting insufficient confidence or Chinese physicians' pursuit of definitive cure. The American Society of Colon and Rectal Surgeons guidelines explicitly state that device therapy aims to reduce hemorrhoid size and alleviate symptoms. Therefore, thorough pre-procedure communication to clarify patient expectations represents a crucial component of independent injection therapy.

This study has several limitations. First, as a cross-sectional survey, it has inherent temporal constraints, with recurrence and complication rates relying on respondents' subjective assessments that may be subject to recall bias. Second, the comprehensive questionnaire may have caused fatigue in some respondents, potentially affecting data accuracy and introducing information bias.

Conclusion

Hemorrhoid injection therapy is a common treatment method widely recognized by anorectal physicians in China, with low recurrence rates and minimal adverse reactions. It can be used independently or in combination with other procedures, requires no specific anesthesia or hospitalization, and produces fewer adverse reactions compared to surgical approaches, making it worthy of implementation across all hospital levels.

Author Contributions

HUO Xingxiao: conceptualization, design, data collection, data curation, statistical analysis, results interpretation, figure/table preparation, manuscript writing. SUN Songpeng: data curation, overall supervision, manuscript revision. LONG Junhong: content oversight. LIANG Longyu, CHU Hongchuan, ZHOU Yangyang, LIU Yan, LIU Jiabin: data collection and curation.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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