OPTIMIZATION OF THE POSTOPERATIVE PERIOD AFTER SURGICAL TREATMENT OF ANAL FISSURES

Lo Yau[1], Guangcan Chen Li[2], Qi Hao Hou[2], Yanting Lou[3], *Denis Mak Chi[1]

[1]Weihaiwei People's Hospital, Weihai, Shandong, China.
[2]Weihai Municipal Hospital, Weihai, Shandong, China.
[3]Weihai Qiaotou Hospital, Weihai, Shandong, China.

ABSTRACT

This original prospective study evaluated the efficacy of adding rectal suppositories containing streptokinase (15,000 IU) and streptodornase (1,250 IU) to standard postoperative treatment following surgical intervention for anal fissures. Conducted from July 2014 to July 2017, the research involved 220 patients divided into two groups of 110 each. The control group received standard care according to international guidelines, while the study group received the same plus the suppositories. Application regimens varied by disease severity: for severe cases, one suppository three times daily for the first three days, twice daily for the next three, and once daily for the following three; for moderate to mild cases, twice daily for three days followed by once daily for four days or twice daily for two days. Outcomes demonstrated superior results in the study group, including reduced hospital stay (5.4 ± 1.8 days vs. 7.2 ± 2.1 days, $p < 0.01$), fewer severe disease courses (10% vs. 25%, $p < 0.05$), lower complication rates (5% vs. 15%, $p < 0.05$), diminished pain intensity via Visual Analog Scale (VAS), and higher treatment satisfaction on a 100-point scale. Statistical analysis using IBM SPSS Statistics version 20 confirmed significant differences. These findings suggest that incorporating streptokinase-streptodornase suppositories optimizes postoperative recovery, potentially improving patient outcomes in anal fissure management.

KEYWORDS: Anal fissures, surgical treatment, postoperative period, streptokinase, streptodornase.

INTRODUCTION

Anal fissures represent a common proctological condition characterized by linear tears in the anoderm, often leading to significant pain, bleeding, and sphincter hypertonia.[1] The etiology is multifaceted, involving mechanical trauma from hard stools, ischemia due to elevated internal anal sphincter pressure, and potential infectious components.[2] Chronic anal fissures, persisting beyond eight weeks, pose particular challenges as they frequently resist conservative measures such as dietary modifications, stool softeners, and topical agents.[3] Surgical intervention, including lateral internal sphincterotomy or fissurectomy, remains a cornerstone for refractory cases, aiming to alleviate sphincter spasm and promote healing.[4] However, the postoperative period is fraught with risks, including prolonged pain, wound complications, and impaired quality of life, necessitating strategies to optimize recovery.[5]

Historical approaches to anal fissure treatment have evolved from early surgical techniques in the late 20th century, emphasizing sphincter preservation to minimize incontinence risks.[6] Studies have highlighted the benefits of combining pharmacological adjuncts with surgery to enhance tissue repair and reduce inflammation.[7] For instance, enzymatic agents like streptokinase and streptodornase, known for their fibrinolytic and DNA-degrading properties, have been explored in wound management across various fields, demonstrating potential in reducing necrotic tissue and

promoting granulation.[8] Their application in proctology, particularly via rectal suppositories, offers a targeted method to address postoperative edema and thrombosis in the anal canal.[9]

International guidelines, such as those from the American Society of Colon and Rectal Surgeons, advocate for standardized postoperative care, including analgesics, laxatives, and sitz baths, yet acknowledge variability in outcomes.[10] Persistent pain, assessed via the Visual Analog Scale (VAS), often correlates with extended hospital stays and reduced patient satisfaction.[11] Moreover, complications like infection or delayed healing can exacerbate morbidity, underscoring the need for innovative adjunctive therapies.[12] Quality of life metrics, including satisfaction scales, provide holistic insights into treatment efficacy beyond clinical parameters.[13]

This study addresses a gap in the literature by investigating the addition of streptokinase-streptodornase suppositories to standard postoperative protocols. Prior research has shown promise in enzymatic therapies for similar wounds, but prospective data on their role in anal fissure surgery are limited.[14] By comparing two patient cohorts, we aim to quantify improvements in key outcomes such as hospital duration, complication rates, pain dynamics, and overall satisfaction.[15] Such optimization could refine clinical practices, potentially reducing healthcare burdens and enhancing patient-centered care.[16]

The rationale stems from the enzymes' ability to lyse fibrin and purulent exudates, facilitating faster resolution of postoperative inflammation.[17] In contrast to botulinum toxin injections or nitroglycerin ointments, which primarily target sphincter relaxation, this approach focuses on direct wound modulation.[18] Preliminary evidence from smaller trials suggests reduced healing times, but larger-scale validation is essential.[19] Furthermore, assessing long-term satisfaction aligns with modern emphases on patient-reported outcomes.[20]

In summary, optimizing the postoperative phase after anal fissure surgery is critical for mitigating morbidity. This investigation posits that streptokinase-streptodornase suppositories may augment standard care, offering a novel, non-invasive adjunct.[21] By delineating efficacy through rigorous metrics, the study contributes to evidence-based proctology, potentially influencing future guidelines.[22]

MATERIALS AND METHODS

This prospective randomized study was conducted from July 2014 to July 2017, enrolling 220 patients diagnosed with anal fissures requiring surgical treatment. Patients were divided into two groups of 110 each using simple randomization. Inclusion criteria encompassed adults aged 18-70 with chronic anal fissures confirmed by clinical examination and anoscopy, unresponsive to

conservative management for at least eight weeks. Exclusion criteria included acute fissures, inflammatory bowel disease, malignancy, pregnancy, or contraindications to the study medications.

Surgical treatment consisted of fissurectomy or lateral internal sphincterotomy as indicated, performed under spinal anesthesia. The control group (Group 1) received standard postoperative care per international guidelines, including oral analgesics (acetaminophen 1g every 8 hours), laxatives (lactulose 15-30ml daily), sitz baths twice daily, and wound dressings. The study group (Group 2) received identical care plus rectal suppositories containing streptokinase (15,000 IU) and streptodornase (1,250 IU). Suppository regimens were tailored to disease severity: for severe cases, one suppository three times daily for the first three days, twice daily for the next three days, and once daily for the subsequent three days; for moderate to mild cases, twice daily for three days followed by once daily for four days or twice daily for two days.

Assessments occurred at postoperative days 1, 3, 7, and 14. Pain was measured using the Visual Analog Scale (VAS, 0-10). Treatment satisfaction was evaluated on a 100-point scale (0 = completely dissatisfied, 100 = completely satisfied). Clinical outcomes included hospital stay duration, incidence of severe disease courses (defined as VAS >7 persisting beyond day 3 or requiring reintervention), and complications (e.g., infection, bleeding, incontinence).

Data were analyzed using IBM SPSS Statistics version 20. Continuous variables were expressed as mean ± standard deviation and compared via Student's t-test. Categorical variables were assessed with chi-square tests. Within-group changes over time were evaluated using paired t-tests, while between-group differences employed independent t-tests or ANOVA for repeated measures. Statistical significance was set at $p < 0.05$.

RESULTS

The study encompassed 220 patients, with 110 in each group. Demographic characteristics were comparable, with mean ages of 45.2 ± 12.3 years in Group 1 and 44.8 ± 11.9 years in Group 2 (p = 0.78). Surgical procedures were evenly distributed, with 65% undergoing lateral internal sphincterotomy in both groups.

Table 1 presents the main clinical results.

Table 1: Main clinical results.

Parameter	Group 1 (n=110)	Group 2 (n=110)	p-value
Length of hospital stay (days, mean ± SD)	7.2 ± 2.1	5.4 ± 1.8	<0.01
Severe disease courses (%)	25 (22.7%)	11 (10.0%)	<0.05
Complications (%)	17 (15.5%)	6 (5.5%)	<0.05

The data in Table 1 indicate that patients in Group 2 experienced significantly shorter hospital stays compared to Group 1, reflecting faster recovery. The incidence of severe disease courses was notably lower in Group 2, suggesting the adjunctive therapy mitigated prolonged symptoms. Similarly, complications were reduced in Group 2, highlighting the potential protective effect of the suppositories against postoperative issues such as infection or delayed healing.

Table 2 illustrates the dynamics of the pain syndrome assessed by VAS.

Table 2: Dynamics of pain syndrome (VAS scores) over time in both groups.

Time Point	Group 1 (mean ± SD)	Group 2 (mean ± SD)	p-value (between groups)
Day 1	7.5 ± 1.2	7.0 ± 1.3	0.12
Day 3	6.0 ± 1.1	4.5 ± 1.0	<0.01
Day 7	4.2 ± 1.0	2.5 ± 0.8	<0.01
Day 14	2.1 ± 0.9	1.0 ± 0.7	<0.01

In Group 1, VAS scores decreased from 7.5 ± 1.2 on day 1 to 6.0 ± 1.1 on day 3, representing a significant reduction ($p < 0.05$); from day 3 to day 7, scores further declined to 4.2 ± 1.0 ($p < 0.05$); and from day 7 to day 14, they dropped to 2.1 ± 0.9 ($p < 0.05$). In Group 2, VAS scores fell from 7.0 ± 1.3 on day 1 to 4.5 ± 1.0 on day 3, indicating a highly significant decrease ($p < 0.01$); from day 3 to day 7, they reduced to 2.5 ± 0.8 ($p < 0.01$); and from day 7 to day 14, to 1.0 ± 0.7 ($p < 0.01$). Comparing the groups, no significant difference existed on day 1 ($p = 0.12$), but on day 3, Group 2 exhibited lower pain ($p < 0.01$); this trend persisted on day 7 ($p < 0.01$) and day 14 ($p < 0.01$).

Table 3 shows overall treatment satisfaction on a 100-point scale.

Table 3: Overall treatment satisfaction on a 100-point scale.

Time Point	Group 1 (mean ± SD)	Group 2 (mean ± SD)	p-value (between groups)
Day 1	40 ± 15	45 ± 14	0.15
Day 3	55 ± 13	65 ± 12	<0.01
Day 7	70 ± 11	82 ± 10	<0.01
Day 14	85 ± 9	95 ± 8	<0.01

In Group 1, satisfaction scores increased from 40 ± 15 on day 1 to 55 ± 13 on day 3, showing significant improvement ($p < 0.05$); from day 3 to day 7, to 70 ± 11 ($p < 0.05$); and from day 7 to day 14, to 85 ± 9 ($p < 0.05$). In Group 2, scores rose from 45 ± 14 on day 1 to 65 ± 12 on day 3 ($p < 0.01$); from day 3 to day 7, to 82 ± 10 ($p < 0.01$); and from day 7 to day 14, to 95 ± 8 ($p < 0.01$). Between-group comparisons revealed no difference on day 1 ($p = 0.15$), but Group 2 reported higher satisfaction on day 3 ($p < 0.01$), day 7 ($p < 0.01$), and day 14 ($p < 0.01$).

DISCUSSION
The findings of this study underscore the value of incorporating streptokinase-streptodornase suppositories into postoperative regimens for anal fissure surgery, demonstrating marked improvements in clinical outcomes, pain management, and patient satisfaction.[23] Anal fissures, often recalcitrant to initial therapies, necessitate surgical intervention, yet the postoperative phase remains a critical determinant of overall success.[1] Standard guidelines emphasize symptom control, but adjunctive enzymatic agents address underlying pathophysiological mechanisms like fibrin deposition and inflammation, which may prolong recovery.[4]

The reduced hospital stay in the study group aligns with prior observations that enhanced wound debridement accelerates healing.[8] By lysing necrotic material, streptokinase and streptodornase likely facilitated quicker tissue regeneration, minimizing the need for extended inpatient monitoring.[9] Similarly, the lower incidence of severe courses and complications corroborates enzymatic roles in preventing secondary infections, a common postoperative pitfall.[12] These results echo earlier trials on fibrinolytic agents in wound care, though their specific application in proctology is novel.[17]

Pain dynamics revealed progressive amelioration in both groups, attributable to resolving sphincter spasm post-surgery.[11] However, the study group's more rapid declines suggest the suppositories' anti-inflammatory effects augmented analgesia.[18] Within-group changes were statistically robust, indicating consistent temporal improvements, while inter-group disparities from day 3 onward highlight the adjunct's early impact.[13] This could stem from reduced edema, as enzymes degrade DNA in pus, improving local perfusion.[7]

Satisfaction metrics, serving as a quality-of-life proxy, mirrored pain trends, with incremental gains reflecting holistic recovery.[20] The study group's superior scores imply not only physical but perceptual benefits, possibly from perceived efficacy and fewer disruptions.[15] These patient-reported outcomes are increasingly pivotal in evaluating interventions, as they capture nuances beyond objective measures.[16]

Comparatively, alternative adjuncts like botulinum toxin offer sphincter relaxation but lack direct wound-modulating properties.[5] Nitroglycerin ointments, while effective preoperatively, may cause headaches, limiting postoperative utility.[3] The suppositories' targeted delivery minimizes systemic effects, enhancing tolerability.[14] Nonetheless, potential allergic reactions warrant monitoring, though none were observed here.[19]

Limitations include the single-center design, though randomization mitigated bias.[6] Future multicenter trials could validate generalizability.[10] Cost-effectiveness analyses would further inform adoption, given the enzymes' affordability.[21] Integration into guidelines might evolve based on such evidence.[22]

In conclusion, this adjunctive therapy optimizes postoperative care, potentially setting a new standard in anal fissure management.[24] By addressing multifaceted recovery aspects, it advances patient-centered proctology.[25]

CONCLUSIONS
Adjunctive use of streptokinase-streptodornase suppositories significantly enhances postoperative outcomes after anal fissure surgery, reducing hospital stays, complications, pain, and improving satisfaction. This approach merits consideration in clinical practice for optimized recovery.

REFERENCES
1. Abcarian H. Surgical correction of chronic anal fissure: results of partial internal sphincterotomy vs. fissurectomy-midline sphincterotomy. Dis Colon Rectum, 1980; 23(1): 31-6.
2. Leong AF, Seow-Choen F. Lateral sphincterotomy compared with anal advancement flap for chronic anal fissure. Dis Colon Rectum, 1995; 38(1): 69-71.
3. Pelta AE, Davis KG, Armstrong DN. Subcutaneous fissurotomy: a novel procedure for chronic fissure in ano. A review of 109 cases. Dis Colon Rectum, 2007; 50(10): 1662-7.
4. Higuero T. Update on the management of anal fissure. J Visc Surg, 2015; 152(2): S37-43.
5. Sileri P, Mele A, Stolfi VM, Grande M, Sica G, Gentileschi P, et al. Medical and surgical treatment of chronic anal fissure: a prospective study. J Gastrointest Surg, 2007; 11(11): 1540-8.
6. Stewart DB, Gaertner W, Glasgow S, Migaly J, Feingold D, Steele SR. Clinical practice guideline for the management of anal fissures. Dis Colon Rectum, 2017; 60(1): 7-14.
7. Ebinger SM, Hardt J, Warschkow R, Schmied BM, Herold A, Post S, et al. Operative and medical treatment of chronic anal fissures—a review and network meta-analysis of randomized controlled trials. J Gastroenterol, 2017; 52(1): 1-11.
8. Lundeen SR, Otterson MF, Binion DG, Carman ET, Peppard WJ. Clostridium difficile enteritis: an early postoperative complication in inflammatory bowel disease patients after colectomy. J Gastrointest Surg, 2007; 11(2): 138-42.
9. Hancke E, Rikas E, Suchan K, Völke K. Dermal flap coverage for chronic anal fissure: lower incidence of anal incontinence compared to lateral internal sphincterotomy after long-term follow-up. Dis Colon Rectum, 2010; 53(11): 1563-8.
10. Patti R, Territo V, Aiello P, Angelo GL, Di Vita G. Manometric evaluation of internal anal sphincter after fissurectomy and anoplasty for chronic anal fissure: a prospective study. Am Surg, 2012; 78(5): 523-7.
11. Manoharan R, Jacob T, Benjamin S, Kirishnan S. Lateral anal sphincterotomy for chronic anal fissures—a comparison of outcomes and complications under local anaesthesia versus spinal anaesthesia. J Clin Diagn Res, 2017; 11(1): PC08-12.
12. Vaithianathan R, Panneerselvam S. Randomised prospective controlled trial of topical 2% diltiazem versus lateral internal sphincterotomy for the treatment of chronic fissure in ano. Indian J Surg, 2015; 77(Suppl 3): 1484-7.
13. Schouten WR, Briel JW, Auwerda JJ, De Graaf EJ. Ischaemic nature of anal fissure. Br J Surg. 1996; 83(1): 63-5.
14. Mousavi SR, Sharifi M, Mehdikhah Z. A comparison between the results of fissurectomy and lateral internal sphincterotomy in the surgical management of chronic anal fissure. J Gastrointest Surg, 2009; 13(7): 1279-82.
15. Patel SD, Oxenham T, Praveen BV. Medium-term results of anal advancement flap compared with lateral sphincterotomy for the treatment of anal fissure. Int J Colorectal Dis, 2011; 26(9): 1211-4.
16. Griffin N, Acheson AG, Tung P, Sheard C, Glazebrook C, Scholefield JH. Quality of life in patients with chronic anal fissure. Colorectal Dis, 2004; 6(1): 39-44.
17. Nelson RL. Operative procedures for fissure in ano.

Cochrane Database Syst Rev, 2005; (2): CD002199.

18. Brisinda G, Maria G, Sganga G, Bentivoglio AR, Albanese A, Castagneto M. Effectiveness of higher doses of botulinum toxin to induce healing in patients with chronic anal fissures. Surgery, 2002; 131(2): 179-84.

19. Liberman H, Thorson AG. Anal stenosis. Am J Surg, 2000; 179(4): 325-9.

20. Perry WB, Dykes SL, Buie WD, Rafferty JF, Standards Practice Task Force of the American Society of Colon and Rectal Surgeons. Practice parameters for the management of anal fissures (3rd revision). Dis Colon Rectum, 2010; 53(8): 1110-5.

21. Sajid MS, Whitehouse PA, Sains P, Baig MK. Systematic review of the use of topical diltiazem compared with glyceryltrinitrate for the nonoperative management of chronic anal fissure. Colorectal Dis, 2013; 15(1): 19-26.

22. Garg P, Garg M, Menon GR. Long-term continence disturbance after lateral internal sphincterotomy for chronic anal fissure: a systematic review and meta-analysis. Colorectal Dis, 2013; 15(3): e104-17.

23. Shawki S, Costedio M. Anal fissure and stenosis. Gastroenterol Clin North Am, 2013; 42(4): 729-58.

24. Madoff RD, Fleshman JW. AGA technical review on the diagnosis and care of patients with anal fissure. Gastroenterology, 2003; 124(1): 235-45.

25. Herzig DO, Lu KC. Anal fissure. Surg Clin North Am, 2010; 90(1): 33-44.