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ORIGINAL ARTICLE

Comparison of Fistulotomy versus Use of 1% silver nitrate in terms of post-operative pain in low-lying perianal fistula.

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ABSTRACT… Objective: To compare the average postoperative pain in patients who received fistulotomy and those who received 1 percent silver nitrate to treat low-lying perianal fistulas. **Study Design:** Randomized Controlled Trial. **Setting:** Department of Surgery, Allied Hospital II (DHQ Hospital), Faisalabad. **Period:** 25th February to 25th August 2025. **Methods:** The qualified patients were randomly allocated into two groups. Group A was done under general anesthesia and had fistulotomy, and Group B was done with 1% of silver nitrate to be applied following curettage of the fistula tract. Visual Analog Scale (VAS) was used to evaluate postoperative pain at 12 weeks, and all analysed data were recorded on an organised proforma. **Results:** Group B (1% silver nitrate) had significantly lower mean pain scores (VAS: 3.37 ± 1.09) than Group A (fistulotomy) did (VAS: 4.30 ± 1.80, p = 0.019) at 12 weeks. Silver nitrate treatment was especially beneficial to younger patients, males, and those who did not have comorbidities. **Conclusion:** The study concludes that 1% silver nitrate is a less invasive and effective alternative to fistulotomy for the treatment of low-lying perianal fistulas, significantly reducing postoperative pain and promoting better recovery.

Key words: Fistulotomy, Minimally Invasive Treatment, Perianal Fistula, Postoperative Pain, Silver Nitrate.

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INTRODUCTION

A fistula in ano is a chronic aberrant communication that extends from the anorectal lumen to an external orifice on the skin of the buttock or perineum. It is typically partially coated by granulation tissue. There are two types of anal fistulas: non-specific and specific. Fistulae can be caused by a number of diseases, including actinomycosis, Crohn's disease, cancer, ulcerative colitis, and tuberculosis. Simple inter-sphincteric, low trans-sphincteric, and complex—high trans-sphincteric, supra-sphincteric, and extra-sphincteric—are the three types of fistulae.[1] Most non-specific perianal fistulas develop after a cryptoglandular abscess drains.[2] Tunnels between the epidermis, anal canal, and rectal mucosa can result from any inflammatory condition. The incomplete repair of these tunnels largely causes fistula development. Many times, perianal fistulas are severe and resistant to conservative therapies. High rates of recurrence, frequent operations, damage to external sphincters, and disruption of quality of life continue to be significant barriers to effective therapy.[3]

Surgery, which was often thought to be the sole therapeutic option, is linked to recurrence, repeated surgery, and, in rare instances, incontinence, which lowers quality of life and does not necessarily lead to full recovery. The two procedures that are typically chosen for this surgery are fistulectomy and fistulotomy. The fistulous tract is opened during a fistulotomy, leaving behind tiny, epithelialized lesions that may speed up the healing process.[4-5] Surgical treatment does, however, come with difficulties. Numerous alternative options for treatment have been discussed. The granulation and epithelialized tissue that border the fistula tract can be ablated with the aid of silver nitrate solution, a chemical agent with cauterizing and corrosive qualities. It promotes the production of scar tissue and the eventual closure of the fistulous tract. Furthermore, the fluid contains antibacterial qualities that lower the microbial burden and aid in anal fistula repair.

A study reported mean postoperative pain after 12 weeks of fistulotomy as 4.49 ± 1.53[6], while another study reported 3.3 ± 1.21 after 1% silver nitrate treatment.[7]

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There are conflicting results for the management of perianal fistula.

Recent evidence has also revealed that treatment choice is not only effective in the postoperative pain but also has a significant impact on the wound healing period, repetition rates, in addition to being simple, cheap, and associated with a low pain profile compared to surgical procedures. Moreover, the procedure does not require any division of the sphincter, thereby minimizing the chances of postoperative incontinence, a frequent complication of fistulotomy.[8-9]

Moreover, research has proposed silver nitrate to enhance healing by a process of coagulation of proteins and sclerosis of tissues that results in the sealing of the fistulous tract by causing fibrosis, which is contrary to fistulotomy, whereby secondary intention is required to accelerate the healing process and cause more pain after surgery.[10] Thus, it is important to test the outcome of pain management in patients who underwent fistulotomy and 1% silver nitrate to create a management plan that would reduce the morbidity, improve the recovery, and increase the quality of life of a patient. Therefore, the study aimed to compare the mean postoperative pain in patients undergoing fistulotomy versus those treated with 1% silver nitrate for low-lying perianal fistulas.

METHODS

This randomized controlled trial was conducted in the Department of Surgery, Allied Hospital II (DHQ Hospital), Faisalabad from 25th February to 25th August 2025 after obtaining approval from the Hospital Ethical Review Committee (No. ERC/FMU/2024-25/126). The sample size was determined using the WHO sample size calculator, keeping the level of significance at 5% and the power of the test at 80%. The anticipated mean in the fistulotomy group was 4.49 ± 1.53[6], while in the silver nitrate group it was 3.31 ± 1.21.[7] The sample size was calculated to be 60 patients, and 30 patients in the group. The sampling of patients was done using a non-probability consecutive sampling method. Both men and women aged between 18 and 50 years who reported low-lying perianal fistula were included in the study. Patients who had earlier undergone surgery to excise fistula, those with complex high rectal fistula (two or more external openings), and those with secondary causes of fistula, including cancer, tuberculosis, or actinomycosis, were not included.

All patients were pre-enrolled using a written informed consent. Each participant was captured on demographic and clinical information. The patients were randomly assigned to two groups according to a computer-generated table of numbers. Group A was treated with fistulotomy, and Group B was treated with 1% silver nitrate. Fistulotomy was an elective procedure done under general anesthesia by a consultant surgeon who had three years of post-fellowship experience. The epithelial lining of the tract in the silver nitrate group was curetted with the plastic end of the cannula until the bleeding appeared. This was followed by flushing 11 ml of 1% solution of silver nitrate, and it was removed gradually as the cannula was withdrawn. To ensure that the skin around the external opening was not exposed to spillage, gauze was placed around the external opening. Visual Analog Scale (VAS) was used in measuring pain, with a range of 0-10, at a 12-week follow-up. SPSS version 25 was used to analyse the data. The quantitative characteristics like age, duration of symptoms (purulent discharge), and the VAS score were given in the form of mean and standard deviation. The gender and comorbidities (hypertension, diabetes mellitus, and cardiac disease) and the type of fistula were specified as frequencies and percentages. The independent sample t-test was used to compare the pain scores of the two groups. Stratification was done, and an independent sample t-test was applied, taking a p-value of 0.05 as significant.

RESULTS

Table-I demonstrates that the baseline demographic and clinical characteristics of both groups were similar, which means that the patient groups were successfully randomized. The age range of the majority of patients in the two groups was 1835 years of age, with a slightly higher mean age of 35.40 4.67 years in the silver nitrate group and 34.07 4.58 years in the fistulotomy group. Both groups were dominated by males, with 60 percent and 56.7 percent, respectively.

The majority of patients in both groups had a brief period of the symptoms (1-2 months), 76.7% in Group A and 73.3% in Group B, with mean durations of the same (1.90 ±0.76 vs. 1.97 ±0.73 months). In the comorbidities, there were more cases of hypertension (30% in each group), and diabetes mellitus was marginally higher (26.7%) in the silver nitrate group than in the fistulotomy group (16.7%). There were 4 cardiac disease patients (13.3) in the fistulotomy group and 0 patients in the silver nitrate group. Approximately 4043 percent of patients in both groups had no comorbidities. In terms of fistula type, the intersphincteric variant was predominant (70% in Group A vs. 73.3% in Group B), followed by transsphincteric fistulas.

Table-II compares postoperative pain scores between the two treatment groups and across various subgroups. The overall mean VAS pain score was significantly lower in the 1% silver nitrate group (3.37 ± 1.09) compared to the fistulotomy group (4.30 ± 1.80) (p = 0.019), indicating that silver nitrate treatment was more effective in reducing postoperative pain. When analyzed by age, patients aged 18–35 years in the silver nitrate group reported significantly less pain than those in the same age range in the fistulotomy group (p = 0.03), whereas no significant difference was observed among those aged 36–50 years. Similarly, male patients experienced significantly lower pain in the silver nitrate group (p = 0.015), while the difference among females was not statistically significant.

Patients with a shorter symptom duration (1–2 months) showed a significant reduction in pain with silver nitrate (p = 0.004), suggesting better efficacy in early-stage cases. Among comorbidities, diabetic patients and those without comorbidities reported notably lower pain levels with silver nitrate (p = 0.002 and p = 0.033, respectively). However, no significant difference was found among hypertensive or cardiac patients. Although pain scores were lower in the silver nitrate group for both intersphincteric and transsphincteric fistulas, these differences did not reach statistical significance (p = 0.089 and p = 0.090, respectively).

DISCUSSION

The treatment of low-lying perianal fistulas has been a clinical challenge because they are recurrent, chronic, and have a severe effect on the quality of life of the patient. Two treatment modalities were checked in the current study: fistulotomy and application of 1 per cent silver nitrate based on the postoperative pain.

TABLE-I

Demographic and clinical characteristics of patients (n = 60)

Characteristics	Categories	Group A (Fistulotomy) n=30 (%)	Group B (1% Silver Nitrate) n=30 (%)	Mean ± SD (Group A)	Mean ± SD (Group B)
Age (years)	18–35	19 (63.3%)	15 (50.0%)	34.07 ± 4.58	35.40 ± 4.67
	36–50	11 (36.7%)	15 (50.0%)		
Gender	Male	18 (60.0%)	17 (56.7%)		
	Female	12 (40.0%)	13 (43.3%)		
Duration of Symptoms (months)	1–2	23 (76.7%)	22 (73.3%)	1.90 ± 0.76	1.97 ± 0.73
	>2	7 (23.3%)	8 (26.7%)		
Comorbidities	Cardiac Disease	4 (13.3%)	0 (0%)		
	Hypertension	9 (30.0%)	9 (30.0%)		
	Diabetes Mellitus	5 (16.7%)	8 (26.7%)		
	None	12 (40.0%)	13 (43.3%)		
Type of Fistula	Intersphincteric	21 (70.0%)	22 (73.3%)		
	Transsphincteric	9 (30.0%)	8 (26.7%)		

TABLE-II

Comparison of Mean Postoperative Pain Scores (VAS) and associations (n = 60)

Variable	Subgroup	Group A Mean ± SD	Group B Mean ± SD	P-Value	Significance
Overall Pain (VAS)		4.30 ± 1.80	3.37 ± 1.09	0.019	Significant
Age (years)	18–35	4.77 ± 2.04	3.43 ± 1.16	0.03	Significant
	36–50	3.47 ± 0.81	3.31 ± 1.08	0.68	NS
Gender	Male	4.61 ± 2.00	3.16 ± 1.21	0.015	Significant
	Female	3.83 ± 1.38	3.64 ± 0.91	0.693	NS
Duration of Symptoms (months)	1–2	4.64 ± 1.61	3.35 ± 1.21	0.004	Significant
	>2	3.16 ± 2.02	3.41 ± 0.76	0.754	NS
Comorbidities	Cardiac	3.55±0.89	-		
	Hypertension	3.25 ± 1.81	3.29 ± 1.44	0.956	NS
	Diabetes Mellitus	5.26 ± 1.45	3.12 ± 0.47	0.002	Significant
	None	4.93 ± 1.79	3.58 ± 1.15	0.033	Significant
Type of Fistula	Intersphincteric	4.23 ± 1.90	3.39 ± 1.23	0.089	NS
	Transsphincteric	4.45 ± 1.62	3.32 ± 0.69	0.09	NS

The results showed that the mean scores of pain in patients who received 1 percent silver nitrate were lower at 12 weeks than the means in patients who received fistulotomy. These findings are in line with the mounting evidence that has been in favor of a minimally invasive, sphincter-preserving solution in minimizing postoperative morbidity and improving the post-surgery outcome.

Fistulotomy has long been considered the standard surgical procedure for simple, low-lying perianal fistulas because of high rates of healing and tolerable recurrence rates. According to Quinn et al. (2025) and Kadiyan et al. (2023), fistulotomy is an effective procedure that provides good elimination of the tract and a low chance of recurrence and incontinence in case it is done properly. However, it can still be associated with much postoperative pain, prolonged healing of the wound, and secondary infection.[11-12] Similar findings were also advised by Choudhury et al., who have stated that despite the fact that fistulotomy has a shorter recovery period than fistulectomy, the pain after the surgery is a significant issue that affects patient satisfaction and adherence to the treatment.[13]

The current study's results are consistent with previously reported literature that suggests chemical cauterization with 1% silver nitrate can still achieve good results with less pain and morbidity. Silver nitrate works by inducing protein coagulation and sclerosis, successfully necrosing epithelialized fistulous tracts while inciting fibrosis and closure. Attaallah et al. (2014) and Demirel et al. (2013) described the actual chemical ablation of granulation tissue in conjunction with decreasing bacterial load to trigger obliteration of the tract without affecting the sphincters.[14,15] Another noteworthy observation was made by Placer-Galan et al. (2019) and Iqbal et al. (2019), who noted significant improvements in pain and healing, ranging from 44% healing to 76% healing, depending on case selection and complexity of the tract.[16,17]

In the current trial, the statistically significant reduction in pain scores (VAS: 3.37 ± 1.09 vs. 4.30 ± 1.80; p = 0.019) highlights the analgesic benefit of chemical cauterization compared to surgical excision. The long-term findings of Attaallah et al. (2021), who reported minimal discomfort and long-lasting symptom relief after multiple outpatient chemical ablation sessions, are similar to these outcomes.[18] Another study found that the postoperative pain for fistulotomy was 1.55 ± 0.79.[19] The lack of extensive tissue dissection, the minimal amount of wound exposure, and the natural antimicrobial properties of

silver nitrate, which lessen the risk of infection and inflammation, may all contribute to the decreased postoperative pain.[20]

The subgroup analysis of the study also indicated that younger patients, males, and those who did not have comorbidities had a greater reduction in pain with silver nitrate. This trend is similar to previous findings that reported patient age, immunity, and systemic conditions like diabetes have an effect on wound healing and postoperative recovery. Yang et al. (2025) further stressed the fact that pain management is a major area of intervention in the context of maximizing patient comfort and adherence levels during the healing process. The use of silver nitrate is an inexpensive outpatient method where the patient does not need to be admitted to the hospital or undergo anesthesia, which is especially advantageous in the patient population with cardiovascular or metabolic comorbidities.[21]

In a broader scope, the present evidence adds to the trend of switching to the sphincter-sparing or least invasive practices in the management of fissures. There have been studies on the use of novel adjuncts like fibrin glue, seton, laser closure, and non-thermal plasma with mixed success rates and cost-effectiveness. An et al. (2024) and Lopez-Callejas et al. (2024) discovered that such advanced methods are effective in complex or recurrent fistulas, and most of them may need specific equipment and skills, which are unavailable in low-resource scenarios; however, silver nitrate is a simple, cheap, and repeatable method that can be promoted into general surgery.[22-23]

One of the strongest points of the research is its randomized controlled design that reduces the selection bias and enhances the validity of intergroup comparisons. The objective measurement of the postoperative discomfort is the assessment of the pain at a fixed interval of 12 weeks using the Visual Analog Scale (VAS). Moreover, effective modifiers like age, comorbidities, and duration of symptoms should be controlled to increase the reliability of subgroup analyses.

The study had limitations. First, the sample (n = 60) was very small, and thus, this could affect generalization. Second, the short-term follow-up (12 weeks) does not permit the assessment of the long-term recurrence and complete fistula healing as the most important indicators of the treatment outcomes. Third, the experience of postoperative pain is subjective, and differences in individual minimal threshold of pain or analgesics could have confounded the results. In addition to that, the researchers have only used one tertiary care facility, and this has diminished the external validity. The future needs to verify these results with multicenter research with larger cohorts, longer follow-up, and patient-reported quality-of-life outcomes to simplify treatment regimens.

These results have a great effect on clinical practice. Silver nitrate is an outpatient, less invasive form of therapy that minimizes postoperative pain and accelerates recovery. It will be of greatest benefit to patients who have increased surgical risks, including those with comorbid conditions like diabetes or those who place premiums on convenience and comfort. It is, however, limited by its low success rate in challenging cases and the occasional need to have multiple sessions of therapy. The use of silver nitrate can be supplemented and its efficacy enhanced together with other less invasive methods, such as fibrin glue or biologic dressing.

CONCLUSION

We concluded that 1% silver nitrate is a less invasive and effective alternative to fistulotomy for managing low-lying perianal fistulas, significantly reducing postoperative pain with a favorable safety profile. Further studies with larger cohorts and extended follow-up are warranted to validate these findings and refine treatment strategies.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. Ali S, Iihan F, Haleez S, Tauseef M, Usman M. **Fistulotomy versus fistulotomy with marsupialization, a randomized controlled trial.** Professional Med J. 2023; 30(08):947-53. https://doi.org/10.29309/TPMJ/2023.30.08.7547
2. Doll D, Vassiliu P. **Silver nitrate for anal fistulas: A word of caution.** Diseases of the Colon & Rectum. 2015 Dec 1; 58(12):e459.
3. Kaya S, Altuntas YE, Kement M, Altun O, Kirac E. **Outcomes of silver nitrate use in perianal fistula: are perianal fistulas still a nightmare for surgeons?** Ann Ital Chir. 2019; 90:480-84.
4. Anan M, Engin SH, Higendy H, Shalaby M, Elshobaky A, Abdel-Razik MA, et al. **Fistulotomy with or without marsupialisation of wound edges in the treatment of simple anal fistula: A randomized controlled trial.** Ann R Coll Surg Engl. 2019; 101(07):472-8.
5. Alidaee MR, Taheri A, Mansoori P, Ghodsi SZ. **Silver nitrate cautery in aphthous stomatitis: A randomized controlled trial.** British Journal of Dermatology. 2005 Sep 1; 153(3):521-5.
6. Shahbaz M, Musa O, Ansari NA. **Comparative analysis of fistulotomy and fistulectomy in managing low anal fistulas.** Iran J Colorectal Res. 2021; 11(1):33-8.
7. El-Ela MA, Abdel-Wahab MA, Korany MA, Mohammed EL. **Histoacryl injection vs. silver nitrate injection in treatment of low non-branching anal fistula.** Egypt J Med Res. 2022; 3(1):372-84.
8. Malhotra S, Vashishtha PR, Jawla V, Virdi KS, Malhotra O, Gupta M. **To compare the efficacy between ligation of intersphincteric fistula tract (LIFT) and fistulotomy procedures in anorectal fistula: An observational study.** Int J Life Sci Biotechnol Pharma Res. 2025 Jan; 14(1):291-96.
9. Gupta PJ. **Role of chemical cauterization with silver nitrate in simple low anal fistula.** Tech Coloproctol. 2018; 22(3):233-39.
10. EL-Baz WA, Abdel-Wahab HA, Korany MA, Mohammed EL. **Histoacryle injection vs. silver nitrate injection in treatment of low non branching anal fistula.** Egyptian Journal of Medical Research. 2022 Jan 1; 3(1):372-88.
11. Quinn R, Peacock A, Lendzion RJ. **Fistulotomy versus fistulectomy for simple fistula-in-ano: A systematic review and meta-analysis of randomized controlled trials.** ANZ Journal of Surgery. 2025 Jun; 95(6):1074-90.
12. Kadiyan R, Kumar B, Sahoo PK, Gautam S, Rani N. **Treatment approaches for the effective management of anal fistula in the modern era.** International Journal of Pharmaceutical Sciences and Nanotechnology (IJPSN). 2023 Nov 15; 16(6):7062-9.
13. Choudhury CT, Al Mamun M, Shahadat M. **Relative comparisons in surgical outcomes of fistulectomy and fistulotomy in low variety perianal fistula.** Public Health. 2023; 3:30-43.
14. Demirel AH, Seyfettin K. **Silver nitrate cauterization for anal fistulas with high blind tract chemical therapy in complicated anal fistulas.** Euroasian J Hepato-Gastroenterol. 2013; 3:49-53.
15. Attaallah W, Tuney D, Gulluoglu BM, Ugurlu MU, Gunal O, Yegen C. **Should we consider topical silver nitrate irrigation as a definitive nonsurgical treatment for perianal fistula?.** Diseases of the Colon & Rectum. 2014; 57(7):882-7.
16. Placer-Galán C, Aguirre-Allende I, Enriquez-Navascués JM. **Local irrigation with silver nitrate, a non-surgical approach for persistent anal fistula.** Journal of Coloproctology (Rio de Janeiro). 2019 Nov 2; 39(1):90-3.
17. Iqbal A, Ahmed T, Khan I, Perveen S, Khan MI. **Outcome of use of 1% silver nitrate in patients with low lying perianal fistula.** Journal of Ayub Medical College Abbottabad. 2019 Aug 3; 31(3):355-8.
18. Attaallah W, Uprak TK, Kara B, Sen A, Tuney D, Yegen C. **Chemical ablation for treating anal fistulas without surgical intervention: long-term results.** Surgical Innovation. 2021 Dec; 28(6):731-7.
19. Haider SM, Abbas MH. **Comparing fistulotomy and fistulectomy in patients with low-lying perianal fistulae.** J Coll Physicians Surg Pak. 2025; 35(07):14-18.
20. Khan S, Shahid N, Qureshi JA, Asjad BZ, Baqqai K, Murtaza Y. **Comparison between fistulotomy vs fistulotomy with marsupialization in simple low anal fistulae: A randomized control trial.** Pakistan Journal of Medical & Health Sciences. 2022 Dec 11; 16(10):492-94.
21. Yang M, Zheng D, Jin X, Tang H, Cao W, Ye Q, et al. **The efficacy of acupuncture in relieving postoperative pain in patients with low simple anal fistula: Protocol of a prospective, randomised, controlled trial.** PLoS One. 2025 Jan 24; 20(1):e0317902.
22. An Y, Gao J, Xu J, Qi W, Wang L, Tian M. **Efficacy and safety of 13 surgical techniques for the treatment of complex anal fistula, non-Crohn CAF: A systematic review and network meta-analysis.** International Journal of Surgery. 2024 Jan 1; 110(1):441-52.
23. López-Callejas R, Velasco-García PS, Betancourt-Ángeles M, Rodríguez-Méndez BG, Berrones-Stringel G, Jaramillo-Martínez C. **Use of non-thermal plasma as postoperative therapy in anal fistula: Clinical experience and results.** Biomedicines. 2024 Aug 15; 12(8):1866.

AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Ali Iqbal:** Data collection, data entry, analysis.
2	**Muhammad Yaqoob:** Proof reading, data analysis.
3	**Shahbaz Ahmad:** Data analysis, critical revision.