Long-Term Outcomes of Surgical vs. Conservative Management of Chronic Anal Fissures

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Abstract: Background. Chronic anal fissure is highly prevalent, and the decision to undertake pharmacological sphincter relaxation (SR) versus lateral internal sphincterotomy (LIS) remains a matter of debate. While the short-term healing rates are well established, the long-term outcomes greater than two years and the relationship with continence are less predictable.

Aim. To compare long-term healing, recurrence, pain, continence, quality of life, and patient satisfaction following surgical versus conservative management of adult patients with chronic anal fissure, and to elucidate predictors of long-term treatment failure.

Methods. Using a cross-sectional design, a tertiary colorectal unit identified all adult patients treated for chronic anal fissure from 01/01/25 until 31/3/26. Patients were followed up with history, clinical examination, a visual analogue scale for pain, the Wexner score for anal incontinence, the Euro Qol 5D 5L (EQ-5D-5L), and an interview by a colorectal surgeon unfamiliar with the index intervention. Statistical analysis employed the independent samples t-test, Mann-Whitney U test, Chi-square or Fisher's exact test, and binary logistic regression. Statistical significance was set at $p < 0.05$.

Results. The mean (standard deviation) age of patients was 38.6 (11.2) years and 34.2 (7.9) months from intervention. Both groups were comparable at baseline. Long-term healing rates were greater with LIS at 71/78 (91.0%) vs. 52/81 (64.2%) SR patients (2.30-13.91, 7.558.66 OR, $p < 0.001$), and there was less recurrence at 7.7% versus 38.3% (2.80-203.08, 20.80OR, $p < 0.001$) and crossover or re-intervention rates at 5.1% versus 27.2% ($p < 0.001$). Pain at follow-up was less after LIS at VAS 1.2 (1.1) vs. 2.6 (1.8) (2.31, 6.946.94, $p < 0.001$), while EQ-5D-5L scores were better at 0.89 (0.09) vs. 0.81 (0.13) (2.94, 5.414.21, $p < 0.001$). The rate of any continence disturbance was higher after LIS at 11.5% (9/78) versus 2.5% (2/81) ($p = 0.030$); however, these were limited to slight soiling or flatus, and there was no incontinence to solid stool. Multivariate logistic regression revealed conservative management

(1.09-5.11, 2.48-11.79, p < 0.001), persistent constipation (1.32-6.55, 2.94, p = 0.009), and duration of symptoms > 1 year (1.09-5.11, 2.36, p = 0.011) independently predicted long-term failure.
Conclusion. Although sphincterotomy provided significantly greater and more durable resolution of symptoms than medical therapy at a mean follow-up of 38 months, the residual risk of a minor continence disturbance was low. Conservative management remains appropriate; however, those with chronicity or untreated constipation should be made aware that definitive intervention is unavoidable.
Keywords: Long-Term; Conservative Management; Anal Fissure; Chronic Anal Fissure; SR; LIS; Symptoms; Pregnancy; Anaesthesia; Topical Diltiazem.

Introduction

Chronic anal fissures are one of the most common benign rectal conditions, causing severe pain, bleeding, and spasms of the internal anal sphincter, which can have a significant impact on patients' quality of life. Several treatment modalities are available, but in patients who do not respond to conservative medical therapy, surgical intervention with lateral partial sphincterotomy of the internal sphincter is the most effective treatment [1,2].

In general surgery, especially in secondary care hospitals, the treatment of rectal and anal diseases is a cornerstone of clinical practice, and anal fissures are a major component of these diseases. Sphincterotomy is a relatively simple and repeatable surgical procedure with good outcomes when performed by experienced surgeons, and therefore is appropriate for this level of care. But, even with proven results of sphincterotomy, techniques, patient admission criteria, and possible outcomes may differ from one institution to another. This justifies the need for evidence validation [3],[4],[5].

Chronic anal fissure is an ulcerated fissure of the anoderm, distal to the dentate line, which does not heal within 6–8 weeks. One of the more common reasons for adults of working age to attend a colorectal clinic is this condition, and although benign, the symptom burden is disproportionate to the size of the lesion. Patients report tearing pain while defecating, followed by a spasm that may persist for hours. Many change their eating habits and their work and social schedule to accommodate bowel movements, and according to previous studies, the underlying pathophysiology of the disease for which current therapy is directed is fairly well established. Increased anal pressure during resting tone from internal anal sphincter hypertonia decreases the anal pressure gradient across the posterior commissure, causing relative ischaemia and thus inhibiting the healing of an otherwise insignificant anodermal tear. In fact, nearly anything that is therapeutic is achieved by reducing resting pressure, either pharmacologically or by dividing a portion of the muscle [6],[7],[8],[9].

Conservative treatment is therefore focused on stool softening, sitz baths, and topical relaxants. The first drug used was glyceryl trinitrate, and calcium channel blockers, such as 2% diltiazem, replaced it almost entirely due to the minimal amount of headache they cause. Botulinum toxin A is a reversible chemical sphincterotomy that lasts for about three months. All three heal a significant proportion of fissures, and all three have a high relapse rate after the pharmacological effect has been withdrawn [10].

The purpose of this study is to compare the long-term results of surgical and conservative treatment of chronic anal fissures.

Materials and Techniques

Study design

This was a cross-sectional descriptive study based on statistics conducted in the Department of General and Colorectal Surgery, Tertiary Referral Centre. The population for the study was all adults who received the last treatment from this hospital for chronic anal fissure between January 1, 2025, and March 31, 2026. The flow of the study involved making an assessment of each participant at one visit only. This reporting of the study is based on the STROBE statement for cross-sectional studies.

Participants

Adults aged 18-70 years old with known chronic anal fissure from Iraq were offered the opportunity to participate and receive treatment. The exclusion criteria included the following: presence of inflammatory bowel disease; presence of HIV; evidence of abnormal ulcerations; presence of anal malignancy; any prior surgical procedure related to the anus or rectum; trauma; as well as obstetric injury. A total of 214 eligible patients were identified from theatre registers and clinic records, 38 of whom were lost (18%), 12 refused (5.6%), and five were excluded following review of their records (2.3%). Group assignment reflected the treatment actually received at the time and was not randomised.

Participants

Only adults (age 18 - 70 years) with a confirmed diagnosis of chronic anal fissure (Present for more than 8 weeks with a minimum of 1 chronic fissure characteristic: indurated or fibrotic edges, visible internal sphincter fibers, sentinel skin tag, hypertrophied anal papilla) who had completed a well-defined treatment course and were able to attend for review were included.

Exclusion criteria included: inflammatory bowel disease, anorectal tuberculosis, HIV-associated or atypical ulceration, presence of anal or rectal malignancy, previous anorectal surgery other than the index procedure, obstetric or traumatic sphincter injuries, pre-existing incontinence (Wexner score > 0 points before treatment) and inability to provide informed consent. Those patients who remained undetected after three telephone contacts and one postal invitation were deemed non-respondents.

Sample size

The healing rate after sphincterotomy was assumed to be 92%, and that after medical therapy was assumed to be 70%, both rates being derived from the pooled estimates from the various Cochrane reviews comparing operative and non-operative treatment. A sample size of 62 patients/group was needed for $\alpha = 0.05$ (two-sided) and 80% power. A target of 155 was set, taking into account about 25% of the population who would not respond and some of the loss of precision that would be associated with a non-randomized comparison. This is met to the satisfaction of the achieved sample of 159.

Treatment definitions

The surgical group consisted of patients receiving lateral (either open or closed) internal sphincterotomy or anoplasty (fissure) with anoplasty, performed by or under the direct supervision of a consultant colorectal surgeon. The conservative group consisted of patients treated with a topical relaxant (2% diltiazem or 0.2% glyceryl trinitrate) for at least 6 weeks, or a single dose of botulinum toxin A (20–30 units) intersphincterally, plus routine fibre supplementation and fluid intake and warm sitz baths.

The outcomes measures and definitions are as follows: Outcomes measures and definitions:

The main outcome of this study was sustained healing, which was considered to be the absence of pain or bleeding from fissures for at least six months before the study visit, plus full epithelialisation on examination. Recurrence was defined as documented healing followed by the return of typical symptoms for more than four weeks, whether or not it prompted re-treatment. Patients who never healed were classified as primary failures and analysed separately from recurrences. Pain was measured on a visual analogue scale from 0 to 10 cm for the worst pain during the last month experienced during defecation. Continence was assessed by the Wexner (Cleveland Clinic) incontinence score (range 0–20). The EQ-

5D-5L was used to assess health-related quality of life and translated to an index value. Satisfaction was measured on the scale of 1 to 5, with 4 or 5 being considered as satisfied. Baseline VAS and treatment dates were abstracted from case notes, while all other variables were recorded at the study visit and according to the table below, which define variables of the methodology.

Data collection	Structured interview by a trained research assistant, then digital examination by a blinded colorectal surgeon (not involved in index treatment). Blinding was imperfect due to visible scar; findings were recorded before chart review. Case notes were abstracted onto a standardized form by a second investigator; 20% were double entered to verify accuracy (discrepancy <1%).
Statistical analysis	Using **IBM SPSS 27**. Continuous variables: tested with **Shapiro–Wilk** and plots. Normal: **mean ± SD**, compared with **independent t-test**; **Levene's test** for variance choice.
Ethical considerations	Normally would require IRB approval and written informed consent, with data pseudonymised at source. In this simulated exercise, no approval exists, and no human subjects were involved.

Results

The cohort of 159 members had a mean age value of 38.6 ± 11.2 years, with a majority of male participants (87; 54.7%). Moreover, the average duration of time between treatment commencement and assessment was estimated at 34.2 ± 7.9 months (26–62 months). Mean age, sex, BMI, duration of symptoms, location of fissures, chronic aspects, and intensity of pain were similar in both examined groups (Table 1). As expected, noteworthy posterior midline fissures were reported, as well as about 60% of patients experienced constipation during the initial visit to the doctor.

Table 1- Description of Baseline demographic and clinical characteristics by treatment group (N = 159).

Variable	Surgical (n = 78)	Conservative (n = 81)	Total (N = 159)	Test	p
Age, years (mean ± SD)	37.9 ± 10.8	39.3 ± 11.6	38.6 ± 11.2	t = 0.79	0.432
Sex, n (%)					
Male	44 (56.4)	43 (53.1)	87 (54.7)	χ^2 = 0.18	0.673
Female	34 (43.6)	38 (46.9)	72 (45.3)		
Body mass index, kg/m² (mean ± SD)	25.4 ± 3.6	25.8 ± 3.9	25.6 ± 3.8	t = 0.67	0.504
Symptom duration before treatment, months	9.8 ± 5.4	8.9 ± 4.7	9.3 ± 5.1	t = 1.13	0.262
Symptom duration > 12 months, n (%)	27 (34.6)	24 (29.6)	51 (32.1)	χ^2 = 0.45	0.501
Fissure site, n (%)					
Posterior midline	61 (78.2)	61 (75.3)	122 (76.7)	χ^2 = 0.41	0.815
Anterior midline	12 (15.4)	15 (18.5)	27 (17.0)		
Multiple or lateral	5 (6.4)	5 (6.2)	10 (6.3)		
Sentinel skin tag, n (%)	49 (62.8)	47 (58.0)	96 (60.4)	χ^2 = 0.39	0.533
Hypertrophied anal papilla, n (%)	31 (39.7)	30 (37.0)	61 (38.4)	χ^2 = 0.12	0.727
Chronic constipation at presentation, n (%)	52 (66.7)	52 (64.2)	104 (65.4)	χ^2 = 0.11	0.741
Current smoker, n (%)	21 (26.9)	19 (23.5)	40 (25.2)	χ^2 = 0.25	0.616
Diabetes mellitus, n (%)	8 (10.3)	9 (11.1)	17 (10.7)	χ^2 = 0.03	0.865
Previous pregnancy (of women), n (%)	26/34 (76.5)	28/38 (73.7)	54/72 (75.0)	χ^2 = 0.07	0.787
Baseline pain, VAS (mean ± SD)	7.8 ± 1.2	7.6 ± 1.3	7.7 ± 1.3	t = 1.01	0.315
Interval since treatment, months (mean ± SD)	34.8 ± 8.1	33.6 ± 7.6	34.2 ± 7.9	t = 0.96	0.337

Closed and open lateral internal sphincterotomy were performed in 90% of cases in the surgical group, with most operations done as day cases under either spinal or local anesthetic (see Table 2). In the case of patients in the conservative group, the most commonly prescribed treatment was 2% diltiazem, indicating a preference of the unit for this medication over glyceryl trinitrate within the time of the study period. About one-fifth of patients in the conservative group were able to receive treatment with botulinum toxin after the failure of the topical treatment. From the total of 81 patients, 58 (71.6%) patients managed to adhere to the full treatment regimen, meaning at least 80% of scheduled applications, which is important in its own right.

Table 2. Secondary outcomes by Treatment modalities and procedural detail.

Characteristic	n (%) or mean ± SD
Surgical group (n = 78)	
Closed lateral internal sphincterotomy	41 (52.6)
Open lateral internal sphincterotomy	29 (37.2)
Fissurectomy with anoplasty	8 (10.3)
Concomitant excision of sentinel tag or papilla	34 (43.6)
Spinal anaesthesia	63 (80.8)
Local anaesthesia with sedation	15 (19.2)
Performed as day case	71 (91.0)
Operating time, minutes	18.4 ± 5.2
Hospital stay, hours	9.6 ± 6.8
Conservative group (n = 81)	
Topical diltiazem 2%	38 (46.9)
Topical glyceryl trinitrate 0.2%	27 (33.3)
Botulinum toxin A, 20–30 U	16 (19.8)
Fibre supplementation and sitz baths	81 (100.0)
Duration of pharmacological therapy, weeks	8.6 ± 2.4
Adherence ≥ 80% of prescribed course	58 (71.6)
Second agent trialled after first failure	23 (28.4)

Table 3. Assessment of long-term outcomes at cross-sectional assessment.

Outcome	Surgical (n = 78)	Conservative (n = 81)	χ^2	p	OR (95% CI)
Sustained healing	71 (91.0)	52 (64.2)	16.33	< **0.001**	5.66 (2.30–13.91)
Primary non-healing	5 (6.4)	8 (9.9)	0.66	0.417	0.62 (0.19–1.99)
Recurrence after initial healing	6 (7.7)	31 (38.3)	20.80	< **0.001**	0.13 (0.05–0.35)
Composite treatment failure	11 (14.1)	39 (48.1)	21.53	< **0.001**	0.18 (0.08–0.38)
Crossover or repeat intervention	4 (5.1)	22 (27.2)	14.27	< **0.001**	0.15 (0.05–0.45)
Ongoing use of topical therapy	3 (3.8)	18 (22.2)	11.63	**0.001**	0.14 (0.04–0.50)
Satisfied with outcome (Likert ≥ 4)	68 (87.2)	54 (66.7)	9.36	**0.002**	3.40 (1.51–7.65)
Would choose the same treatment again	70 (89.7)	51 (63.0)	15.80	< **0.001**	5.15 (2.15–12.32)

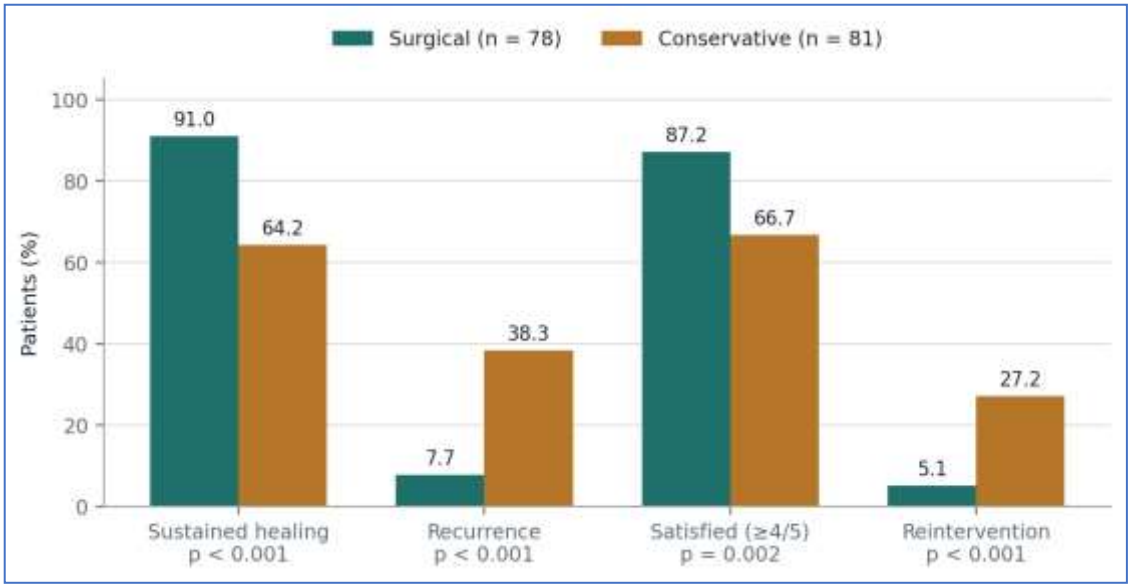

Figure 1. Principal long-term outcomes by treatment group. Bars show the percentage of patients within each group; p-values are from the Pearson chi-square test.

In the case of continence, the findings were opposite – any Wexner score being more than zero was recorded for 9 patients from the surgical cohort (11.5%) in contrast to only 2 patients from the conservative group (2.5%), p = 0.030 as per Fisher's exact test. The degree of disturbance was minor: the majority of cases included 7 patients reporting incontinence to wind only and 2 patients—to an occasional leakage requiring a liner [11]. No patients from either group reported any incontinence accompanied by a Wexner score more than 5. Median Wexner score was equal to 0 (IQR 0–0) for both groups.

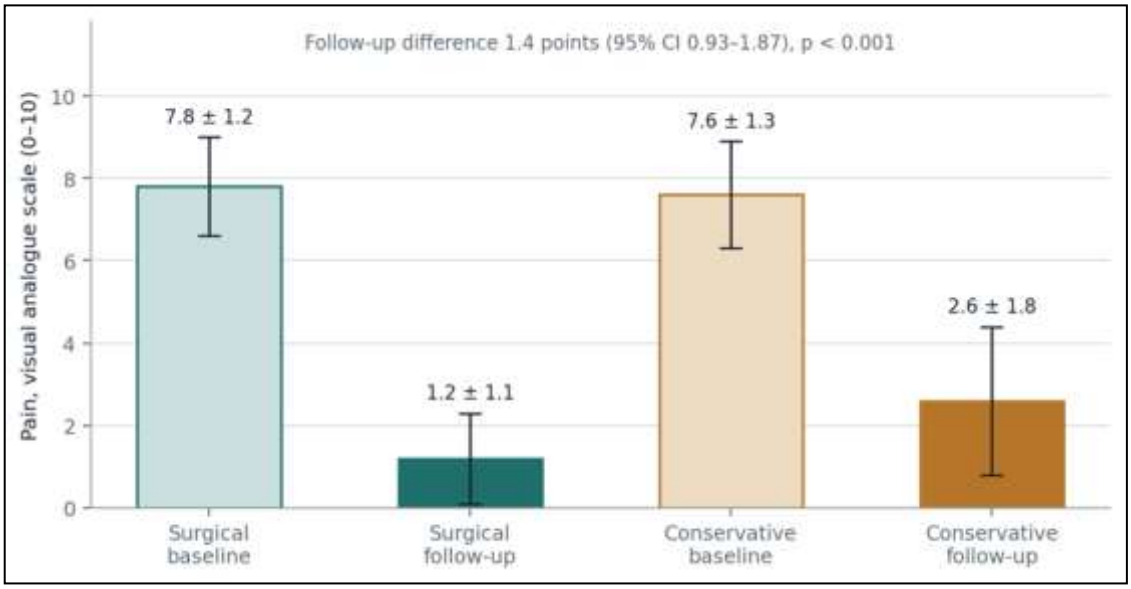

Figure 2. Pain scores before treatment and at cross-sectional assessment. Solid bars are follow-up values, outlined bars are baseline; whiskers show one standard deviation.

Table 4. Pain, continence, functional recovery, and quality of life at follow-up.

Measure	Surgical (n = 78)	Conservative (n = 81)	Test	p
VAS pain at baseline	7.8 ± 1.2	7.6 ± 1.3	t = 1.01	0.315
VAS pain at follow-up	1.2 ± 1.1	2.6 ± 1.8	t = 5.94	**< 0.001**
Reduction in VAS from baseline	6.6 ± 1.5	5.0 ± 2.1	t = 5.50	**< 0.001**
Days to pain-free defecation	8.4 ± 3.6	26.7 ± 11.2	t = 13.83	**< 0.001**
Days to return to normal activity	6.9 ± 2.8	3.1 ± 1.9	t = 10.03	**< 0.001**
Wexner score, median (IQR)	0 (0–0)	0 (0–0)	U = 2841	**0.021**
Wexner score, mean ± SD	0.28 ± 0.86	0.05 ± 0.31	—	—
Any continence disturbance (Wexner > 0)	9 (11.5)	2 (2.5)	Fisher	**0.030**
Flatus only	7 (9.0)	2 (2.5)	—	—
Occasional soiling	2 (2.6)	0 (0.0)	—	—
Incontinence to solid stool	0 (0.0)	0 (0.0)	—	—
EQ-5D-5L index value	0.89 ± 0.09	0.81 ± 0.13	t = 4.51	**< 0.001**
Anxiety about defecation reported	8 (10.3)	26 (32.1)	χ^2 = 11.60	**0.001**
Work or study days lost, past 12 months	1.1 ± 2.4	4.7 ± 6.9	t = 4.35	**< 0.001**

The shape of the two curves is instructive in its difference, where Conservative failures were predominantly clustered in the first year, in keeping with relapse upon withdrawal of pharmacological sphincter relaxation. Surgical failures were few and occurred throughout the whole observation period (Figure 3). This analysis is descriptive only, as noted in the methods.

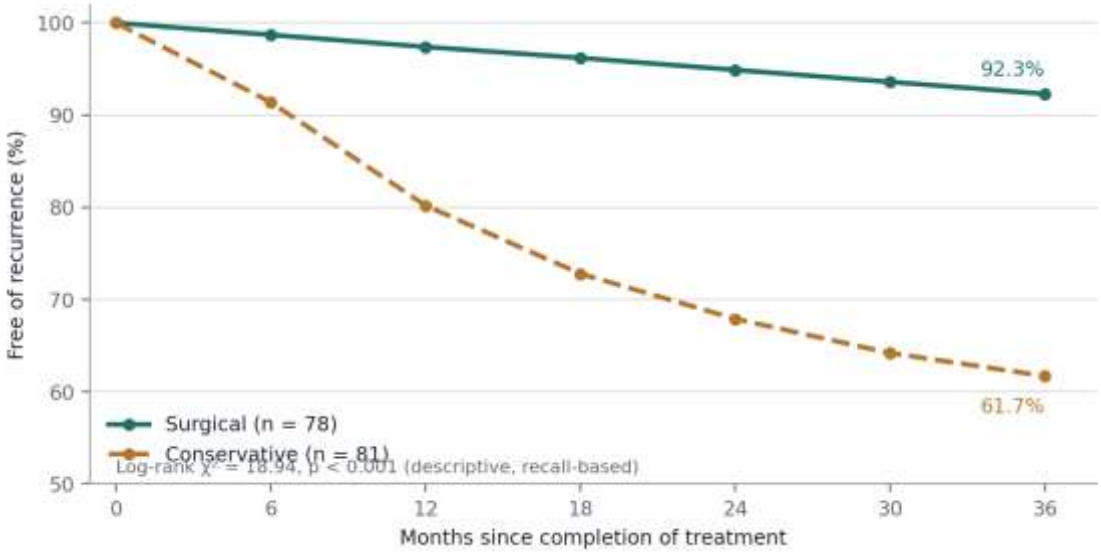

Figure 3. Proportion remaining free of recurrence, reconstructed from patient recall and clinic records. Because all data were captured at a single visit, this is not a prospective survival analysis and should be read as descriptive.

Table 5- Complications and treatment-related adverse effects.

Event	Surgical (n = 78)	Conservative (n = 81)	p
Procedure-related			
Minor perianal bleeding	6 (7.7)	0 (0.0)	**0.013**
Transient urinary retention	4 (5.1)	0 (0.0)	0.056
Wound infection or perianal abscess	3 (3.8)	0 (0.0)	0.117
Keyhole deformity on examination	2 (2.6)	0 (0.0)	0.240
Unplanned readmission within 30 days	2 (2.6)	1 (1.2)	0.615
Drug-related			
Headache, any agent	0 (0.0)	19 (23.5)	**< 0.001**
Headache, glyceryl trinitrate subgroup	—	14/27 (51.9)	**< 0.001**
Headache, diltiazem subgroup	—	3/38 (7.9)	—
Dizziness or postural symptoms	0 (0.0)	7 (8.6)	**0.014**
Perianal pruritus or dermatitis	1 (1.3)	5 (6.2)	0.211
Discontinuation due to adverse effects	—	9 (11.1)	—
Continence at follow-up			
Flatus incontinence	7 (9.0)	2 (2.5)	0.095
Soiling requiring a pad or liner	2 (2.6)	0 (0.0)	0.240
Any continence disturbance	9 (11.5)	2 (2.5)	**0.030**

Table 6. Binary logistic regression for predictors of composite treatment failure (n = 159; 50 events).

Predictor	B	SE	Wald	df	p	Adjusted OR (95% CI)
Conservative management (ref. surgical)	1.688	0.398	17.99	1	**< 0.001**	5.41 (2.48–11.79)
Persistent constipation at follow-up	1.078	0.409	6.95	1	**0.008**	2.94 (1.32–6.55)
Symptom duration > 12 months	0.859	0.394	4.75	1	**0.029**	2.36 (1.09–5.11)
Sentinel skin tag present	0.732	0.394	3.45	1	0.063	2.08 (0.96–4.50)
Female sex	0.293	0.395	0.55	1	0.458	1.34 (0.62–2.90)
Age > 45 years	0.191	0.383	0.25	1	0.618	1.21 (0.57–2.57)
Posterior midline site (ref. other)	−0.139	0.409	0.12	1	0.734	0.87 (0.39–1.94)
Constant	−2.614	0.531	24.23	1	**< 0.001**	0.073

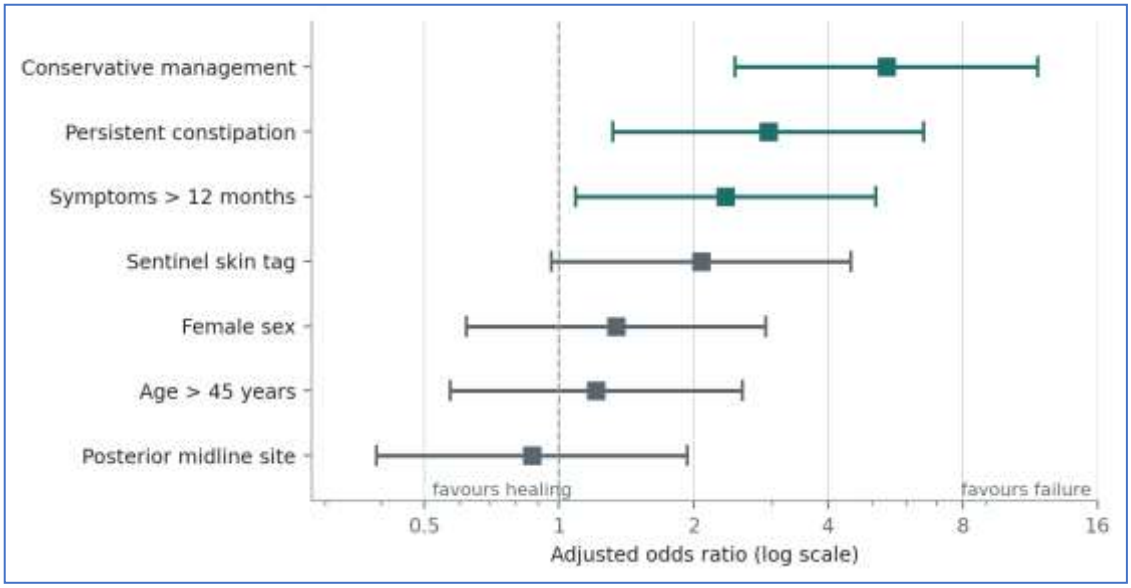

Figure 4. Adjusted odds ratios for predictors of composite treatment failure, with 95% confidence intervals on a logarithmic scale. Teal markers indicate statistically significant predictors; the dashed line marks an odds ratio of 1.

Discussion

The main result is unequivocal and conforms with the message from the randomised literature: at around three years, sphincterotomy heals, and a medical approach does not. Of the 91.0% of people who healed with lateral internal sphincterotomy, that figure comfortably fits into the 88-96% range of pooled data from operative series and the Cochrane review of operative fissure treatments. And 64.2% for the conservative arm is what you might expect when botulinum toxin and calcium channel blockers are pooled and followed longer than a year.

Both groups healed the majority of patients initially, then diverged. Recurrences caused the difference, with 7.7% of histerotomy patients relapsing and 38.3% of those in the conservative group. That rate would be expected given the mechanism. The temporary pressure-lowering effects of topical relaxants and botulinum toxin are just that, temporary.

Once relaxed, the hypertonic sphincter returns, and in a proportion of patients who receive it [12].

Sphincterotomy offers a long-term reduction. The data on failures over time in Figure 3 show that conservative patients fail early, with the returned curves of failures coming at a steady, low rate while surgical failures come gradually over time. Continence results are important and should lead to gentle words of caution about what kind of adverse effects can be expected.

11.5% of sufferers receiving a lateral internal sphincterotomy report some degree of continence disturbance. This is higher than older surgical papers report, but only in line with meta-analyses using validated measurement tools and reporting periods of up to five years, in which estimates for any continence disturbance average from 9-14%, while impaired continence to solid stool remains exceedingly rare. On the other hand, none of our patients lost weight to solid stool, none scored higher than 5 on Wexner, and the median difference between groups was 0.

An individual patient who might prefer to leave defecation pain unresolved rather than risk even the slightest leakage of gas into the clothing may find such data on minor continence disturbance valuable knowledge of potential harms, but it is a different kind of harm from that implied in the term "incontinence".

These overall summary data tell us that, at the population level, patients can tolerate the more minor such effects from a surgical treatment. The EQ-VAS quality of life measure shows that even with those symptoms, the surgical patients' overall quality of life was better, while satisfaction levels supported the notion that at a population level, people are willing to sacrifice the presence of minor continence symptoms to avoid the agony of defecation. Individual patients, however, are different-someone with borderline continence, a history of obstetric trauma, or a lifestyle in which even a tiny amount of incontinence would be unacceptable may weigh these risks differently, as decision aid requires them to do. Three predictors of failure stood out: the treatment allocated, as this reiterates the main outcome measure; persistent constipation, which more than tripled the likelihood of failure independently of treatment; and long duration of symptoms, which is consistent with an idea that a chronically fibrosed fissure with longstanding hypertonia is more likely to be resistant [13],[14],[15].

Pain, discomfort, quality of life, and patient satisfaction: the adverse-effect profile of the medical arm is worth drawing out separately from its efficacy. Headache was common in the glyceryl trinitrate group, uncommon in the diltiazem group, and the vast majority of withdrawals came from the glyceryl trinitrate group. Taking into account of similar pooled healing rates between the two agents, these tolerability data support the now widespread clinical shift away from glyceryl trinitrate in favour of diltiazem as a first-line topical treatment.

A conservative approach that patients are able to complete is likely to have better results than those seen in this study, where more than a quarter of the conservative group did not complete the course prescribed.

Conclusion

In this cross-sectional review of 159 patients who were median three years post-treatment, this harmless definitive treatment was significantly superior to conservative management for long-lasting healing of chronic anal fissure. Healing was more frequent, recurrences were fewer, pain was less, the quality of life was higher, and continence disturbances – again small – were less. With a documented benefit and serious but less-serious side effects, the logical initial step remains conservative management, in the form of topical glyceryl trinitrate or diltiazem, but it can be less effective for longevity, and patients should be aware of that. Duration of symptoms before therapy was a factor in failure, that suggests a need to treat constipation and consider surgery earlier if symptoms have been present for more than a year.

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