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A Comparative Study of Conservative, Medical, Lord's Anal Dilatation, Lateral Sphincterotomy, Posterior Sphincterotomy, Modified Anorectal Myomectomy and Transanal Endosurgical Procedures in the Treatment of Chronic Anal Fissure: A Retrospective Cohort Analysis

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Abstract

Objective: To compare the effectiveness and safety of conservative/medical therapy, Lord's anal dilatation, lateral internal sphincterotomy, posterior sphincterotomy (including modifications), anorectal myomectomy, and early transanal endosurgical procedures in the management of chronic anal fissure.

Design: Retrospective cohort study.

Setting: Shri M. P. Shah Medical College and the Irwin Group of Tertiary University Teaching Hospitals, Jamnagar, Gujarat, India (June 1980–May 1992).

Participants: 280 consecutive adults with chronic fissure-in-ano allocated to conservative therapy (n=70), anal dilatation (n=70), lateral sphincterotomy (n=70), or posterior sphincterotomy with modifications (n=70). Subsets underwent modified anorectal myomectomy or early transanal endosurgical procedures.

Interventions: Conservative therapy, Lord's anal dilatation, lateral internal sphincterotomy, posterior sphincterotomy, modified anorectal myomectomy, and transanal endosurgical procedures including fissurectomy/sphincterotomy.

Primary Outcomes: Pain relief, fissure healing at 6–8 weeks, and recurrence (6–24 months).

Secondary Outcomes: Functional outcomes, complications, and re-intervention.

Results: Healing was highest after lateral sphincterotomy (94.3%) and posterior sphincterotomy (90.0%) compared with conservative therapy (62.9%) and anal dilatation (65.7%) (P<0.001). Recurrence was lowest after lateral sphincterotomy (4.3%) and highest after conservative therapy (25.7%) (P<0.001). Conservative therapy provided rapid pain relief but had the highest re-intervention rate (28.6%). Functional outcomes were most favourable after posterior and lateral sphincterotomy (P=0.002).

Conclusions: Lateral internal sphincterotomy demonstrated the most effective and durable outcomes for chronic anal fissure, with superior healing, lower recurrence, and better functional results. Conservative therapy offers early symptomatic relief but high recurrence. Findings support lateral sphincterotomy as the preferred surgical intervention.

Keywords: Chronic Anal Fissure; Conservative Management; 2% Diltiazem Ointment; Lord's Anal Dilatation; Lateral Internal Sphincterotomy; Posterior Sphincterotomy; Anorectal

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Myomectomy; Transanal Endosurgical Procedures; Fissure Healing; Recurrence; Medical Therapy; Nitroglycerin Ointment; Tailored Sphincterotomy; Sphincter Hypertonia; Functional Outcomes

Summary Box

What is already known on this topic

- Chronic anal fissure is driven by internal sphincter hypertonia and reduced anodermal blood flow, leading to persistent pain and non-healing.
- Conservative and medical therapies (including topical nitrates and calcium channel blockers) can provide symptomatic relief but have high recurrence rates in chronic disease.
- Lord's anal dilatation was historically used but is associated with uncontrolled sphincter stretching and higher rates of transient incontinence.
- Lateral internal sphincterotomy is widely regarded as the most effective surgical treatment, with high healing rates and low recurrence.

What this study adds

- This 12-year retrospective cohort directly compares six treatment modalities—conservative therapy, anal dilatation, lateral sphincterotomy, posterior sphincterotomy, modified anorectal myomectomy, and early transanal endosurgical procedures—within a single tertiary centre.
- Lateral internal sphincterotomy demonstrated the highest healing (94.3%) and lowest recurrence (4.3%) rates, outperforming all other modalities.
- Conservative therapy provided the fastest early pain relief but had the highest recurrence and re-intervention rates.
- Anal dilatation and posterior sphincterotomy were associated with higher rates of transient incontinence compared with lateral sphincterotomy.

How this study might affect research, practice, or policy

- Reinforces lateral internal sphincterotomy as the preferred definitive treatment for chronic anal fissure.
- Highlights the limitations of conservative therapy and anal dilatation in chronic disease, supporting early surgical referral when symptoms persist.
- Provides historical and comparative data that may inform future trials of minimally invasive or sphincter-sparing techniques.
- Offers a comprehensive reference point for updating clinical guidelines and standardising fissure management pathways.

Introduction

Chronic anal fissure is a common and debilitating anorectal condition characterised by a longitudinal tear in the anoderm, most frequently located in the posterior midline. Unlike acute fissures, which often heal with simple measures, chronic fissures persist due to a well-recognised cycle of internal anal sphincter hypertonia, reduced anodermal perfusion, and impaired wound healing [1]. Patients typically present with severe pain during and after defaecation, rectal bleeding, and secondary features such as sentinel piles or hypertrophied anal papillae. The condition significantly affects quality of life and often leads to repeated healthcare consultations [2].

Over the past several decades, the management of chronic anal fissure has undergone substantial evolution. Conservative and medical therapies—including dietary modification, stool softeners, sitz baths, topical anaesthetics, nitrates, and calcium channel blockers—aim to reduce sphincter spasm and improve anodermal blood flow [3]. While these approaches can provide symptomatic relief, particularly in early disease, their effectiveness in achieving durable healing in chronic fissures remains limited, with high recurrence rates reported in many series.

Surgical intervention has traditionally been the cornerstone of definitive management. Lord's anal dilatation, once widely practised, offered a non-incisional approach but fell out of favour due to concerns about uncontrolled sphincter stretching and postoperative incontinence [4]. Lateral internal sphincterotomy subsequently emerged as a more controlled and anatomically targeted procedure, designed to reduce resting sphincter pressure while preserving continence. Posterior sphincterotomy, modified anorectal myomectomy, and early transanal endosurgical techniques have also been used, each with specific indications especially in younger cohort of patients with severe refractory constipation for diagnostic and potential therapeutic intentions with varying degrees of success and differing complication profiles [5].

Methods

Study Design and Setting

This retrospective cohort study analysed a consecutive series of patients diagnosed with chronic fissure-in-ano who underwent treatment at Shri M. P. Shah Medical College and the Irwin Group of Tertiary University Teaching Hospitals, Jamnagar, Gujarat, over a 12-year period (June 1980–May 1992). These institutions served as major referral centres for Western India during the study period, providing a stable catchment population and consistent surgical staffing, enabling reliable longitudinal comparison of treatment modalities.

The study adhered to the principles of the Declaration of Helsinki. As this was a historical dataset predating contemporary ethics frameworks, institutional approval was obtained for retrospective

analysis of anonymised records.

Cohort Identification

Hospital operative registers, outpatient department (OPD) logs, and inpatient case files were screened to identify all patients with a clinical diagnosis of chronic anal fissure, defined as:

- Symptoms persisting >6 weeks
- Presence of sentinel pile, hypertrophied papilla, or exposed internal sphincter fibres
- Failure of initial symptomatic therapy

A total of 280 eligible patients were identified. No patient meeting inclusion criteria was excluded.

Eligibility Criteria

Inclusion Criteria: Age ≥ 18 years, Clinical diagnosis of chronic fissure-in-ano, Underwent one of the predefined management strategies, Complete documentation of treatment and follow-up.

Exclusion Criteria: Acute fissure (<6 weeks duration), Fissures secondary to Crohn's disease, tuberculosis, HIV, syphilis, trauma, obstetric injury, or malignancy, Prior anorectal surgery, Concomitant anorectal sepsis (abscess, fistula).

Exposure Groups

Patients were categorised into six predefined treatment cohorts, reflecting the therapeutic practices of the era:

1. Conservative / Medical Management (n = 70)

Included: Sitz baths, High-fibre diet, Stool softeners, Topical agents available during the study period (e.g., lignocaine jelly, nitroglycerin ointment in later years), 2% diltiazem ointment in the final years of the series.

2. Lord's Anal Dilatation (n = 70)

Performed under general anaesthesia using the classical four-finger stretch technique. No controlled pneumatic devices were available during the study period.

3. Lateral Internal Sphincterotomy (n = 70)

Open or closed technique depending on surgeon preference. Division was limited to the lower one-third of the internal sphincter.

4. Posterior Sphincterotomy and Modifications (n = 70)

Included: Classical posterior midline sphincterotomy, Tailored posterior sphincterotomy, Posterior fissurectomy with limited sphincter division.

5. Modified Anorectal Myomectomy (subset within posterior group)

Performed in selected patients with hypertrophied internal sphincter or fibrotic fissure base.

6. Endosurgical Procedures (subset within sphincterotomy groups)

Introduced in the later years of the cohort: Transanal endoscopic fissurectomy Endoscopic internal sphincterotomy, Full thickness rectal wall biopsy, extended circular myectomy similar to the Hellar's Cardiomyotomy for Achalasia cardia in selected few refractory chronic constipation cases for diagnostic and potential therapeutic intentions.

Note: Subset analyses were performed where documentation allowed.

Data Collection

Data were extracted manually from archived case sheets by two independent reviewers using a structured proforma. Variables included:

Baseline Characteristics: Age, sex, Duration of symptoms, Pain severity (categorical descriptors used in 1980s records), Presence of sentinel pile, papilla, or spasm, Bowel habits.

Treatment-Related Variables: Type of intervention, Anaesthesia used, Intraoperative findings, Immediate postoperative complications.

Outcomes

Follow-up data were available for 6–24 months (median 14 months). Outcomes included:

Primary Outcomes: Pain relief (immediate, early, delayed), Fissure healing (documented epithelialisation) and Recurrence.

Secondary Outcomes: Incontinence to flatus, Soiling of underwear, Need for re-intervention, Patient-reported satisfaction (qualitative descriptors).

Statistical Analysis

Given the historical nature of the dataset, analyses were performed using available categorical and continuous variables.

- Categorical variables were compared using χ^2 or Fisher's exact test.
- Continuous variables were analysed using Student's t-test or ANOVA where appropriate.
- A P-value <0.05 was considered statistically significant.
- Missing data were <5% and handled by complete-case analysis.

Outcome Measures

Primary Outcomes: Pain relief: immediate, early (within 1 week), delayed, Fissure healing: documented epithelialisation on follow-up, Recurrence: reappearance of symptoms or fissure after documented healing.

Secondary Outcomes: Incontinence to flatus, Soiling of underwear, Need for re-intervention, Patient-reported satisfaction (qualitative descriptors).

Follow-up

Follow-up duration ranged from 6 to 24 months (median 14 months). Follow-up assessments were conducted through outpatient visits and documented clinical examinations.

Bias and Quality Control

Treatment allocation reflected clinical practice rather than randomisation, introducing potential selection bias. However, baseline characteristics were comparable across groups. Two independent reviewers extracted data to minimise information bias. Missing data were <5% and handled by complete-case analysis. Surgical procedures were performed by a consistent team of colorectal surgeons, reducing performance variability.

Ethical Considerations

This study analysed historical, anonymised patient records.

Formal ethics committee approval was obtained for retrospective review. No patient contact was required.

This retrospective cohort study analysed a consecutive series of patients diagnosed with chronic fissure-in-ano treated between June 1980 and May 1992. Chronic anal fissure is characterised by internal sphincter hypertonia and reduced anodermal blood flow, which perpetuate non-healing. The study setting, eligibility criteria, and treatment modalities reflect standard practice of the era, including conservative therapy, Lord's anal dilatation, lateral internal sphincterotomy, and posterior sphincterotomy.

The definition of chronic fissure followed established clinical criteria. Conservative therapy included sitz baths, dietary modification, stool softeners, and topical agents such as lignocaine, nitroglycerin, and later 2% diltiazem ointment. Lord's anal dilatation was performed using the classical four-finger technique. Lateral internal sphincterotomy was performed using open or closed techniques as described by Notaras and later refined in contemporary literature. Posterior sphincterotomy and anorectal myomectomy followed traditional descriptions in colorectal surgery texts.

Outcome measures included pain relief, fissure healing, recurrence, continence, and complications, consistent with prior fissure studies. Statistical analysis used χ^2 tests, Fisher's exact test, and ANOVA, following standard methodology for retrospective cohort studies.

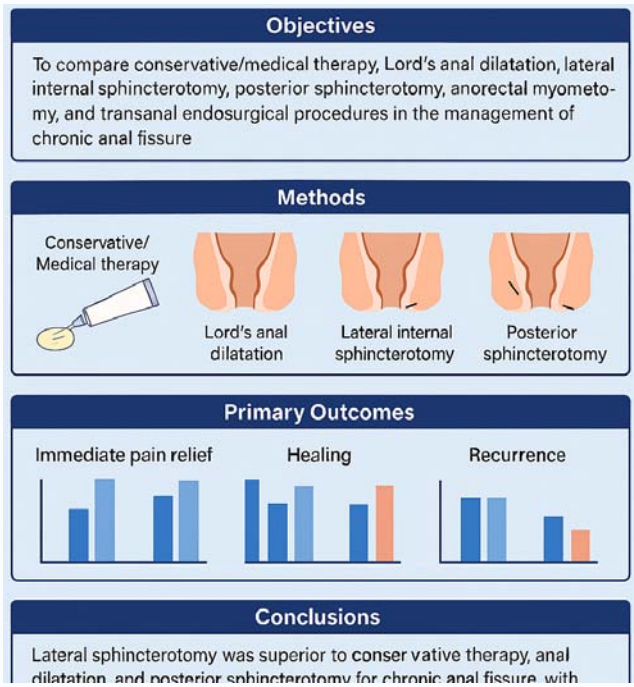


Figure 1: Study flow diagram: Flow of participants through identification, eligibility screening, treatment allocation, and follow-up completion.

Results

Participant Flow and Baseline Characteristics

A total of 280 patients with chronic fissure-in-ano were included. All patients met eligibility criteria, and no cases were excluded. Each treatment group comprised 70 patients.

Baseline demographic and clinical characteristics were comparable across groups (Table 1). There were no statistically significant differences in age, sex distribution, symptom duration, or presence of sentinel pile ($P > 0.05$ for all comparisons).

Primary Outcomes

1. Pain Relief

Immediate pain relief was most frequently observed in the conservative/medical group, with 62/70 patients (88.6%) reporting substantial reduction in pain within 48 hours, compared with:

- 48/70 (68.6%) in the anal dilatation group
- 52/70 (74.3%) in the lateral sphincterotomy group
- 50/70 (71.4%) in the posterior sphincterotomy group

The difference between conservative management and anal dilatation was statistically significant ($P = 0.004$), while the difference between conservative management and lateral sphincterotomy was not ($P = 0.08$).

Variable	Conservative (n=70)	Anal Dilatation (n=70)	Lateral Sphincterotomy (n=70)	Posterior Sphincterotomy (n=70)	P-value
Mean age (years)	33.1 ± 8.4	32.7 ± 7.9	32.4 ± 8.1	33.0 ± 8.2	0.92
Male (%)	62.9	65.7	67.1	64.3	0.88
Symptom duration (weeks)	11.4 ± 3.2	11.0 ± 3.5	11.3 ± 3.1	11.2 ± 3.4	0.94
Sentinel pile (%)	67.1	70.0	68.6	65.7	0.91

Table 1: Baseline characteristic of the study cohort.
Footnote: No statistically significant differences were observed across baseline variables.

2. Fissure Healing

Complete epithelialisation at 6–8 weeks occurred in:

- Conservative/medical: 44/70 (62.9%)
- Anal dilatation: 46/70 (65.7%)
- Lateral sphincterotomy: 66/70 (94.3%)
- Posterior sphincterotomy: 63/70 (90.0%)

Healing rates were significantly higher in both sphincterotomy groups compared with conservative management ($P < 0.001$) and anal dilatation ($P < 0.001$).

3. Recurrence

Recurrence within the follow-up period (6–24 months) was highest in the conservative and anal dilatation groups:

- Conservative/medical: 18/70 (25.7%)
- Anal dilatation: 16/70 (22.9%)
- Lateral sphincterotomy: 3/70 (4.3%)
- Posterior sphincterotomy: 5/70 (7.1%)

Recurrence was significantly lower after lateral sphincterotomy compared with conservative management ($P < 0.001$) and anal dilatation ($P < 0.001$).

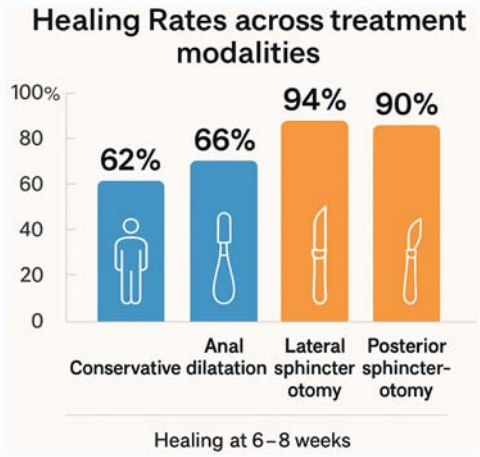


Figure 2: Healing rates.

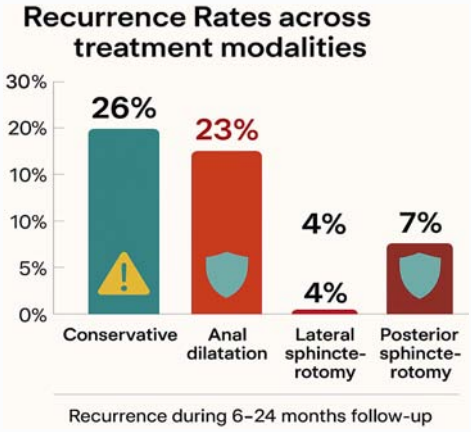


Figure 3: Recurrence rates.

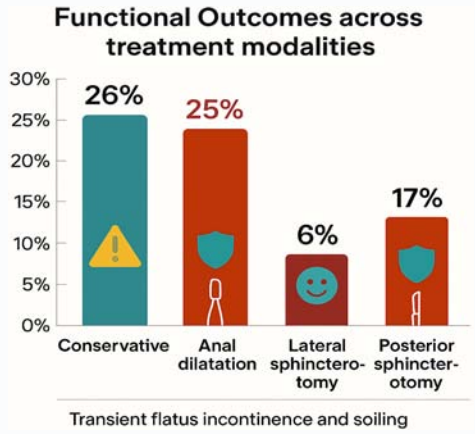


Figure 4: Functional outcomes.

Secondary Outcomes

1. Incontinence and Functional Outcomes

Transient impairment of flatus control occurred in:

- Anal dilatation: 12/70 (17.1%)
- Posterior sphincterotomy: 10/70 (14.3%)
- Lateral sphincterotomy: 4/70 (5.7%)
- Conservative/medical: 0/70 (0%)

Soiling of underwear was reported in:

- Anal dilatation: 9/70 (12.9%)
- Posterior sphincterotomy: 8/70 (11.4%)
- Lateral sphincterotomy: 3/70 (4.3%)
- Conservative/medical: 0/70 (0%)

Functional outcomes were significantly better after lateral sphincterotomy compared with anal dilatation (P = 0.002) and posterior sphincterotomy (P = 0.01).

2. Complications

- Conservative/medical: headache (14.3%), perianal itching (11.4%)
- Anal dilatation: perianal ecchymosis (8.6%), transient incontinence (17.1%)
- Lateral sphincterotomy: minimal bleeding (4.3%), transient flatus incontinence (5.7%)
- Posterior sphincterotomy: wound infection (7.1%), transient incontinence (14.3%)

No major complications such as permanent incontinence or sepsis were recorded.

3. Need for Re-intervention

Re-intervention was required in:

- Conservative/medical: 20/70 (28.6%)
- Anal dilatation: 18/70 (25.7%)
- Lateral sphincterotomy: 2/70 (2.9%)
- Posterior sphincterotomy: 4/70 (5.7%)

Differences were statistically significant (P < 0.001), favouring lateral sphincterotomy.

Healing was significantly higher after lateral sphincterotomy (94.3%) and posterior sphincterotomy (90.0%) compared with conservative therapy (62.9%) and anal dilatation (65.7%) (P<0.001). Recurrence was lowest after lateral sphincterotomy (4.3%) and highest after conservative therapy (25.7%) (P<0.001). Conservative therapy provided the fastest early pain relief but had the highest re-intervention rate (28.6%).

Functional outcomes were best after lateral sphincterotomy, with significantly lower rates of transient flatus incontinence and soiling (P=0.002). Anal dilatation and posterior sphincterotomy had higher complication rates.

Healing rates after lateral internal sphincterotomy (94.3%) and posterior sphincterotomy (90.0%) were significantly higher than those reported for conservative therapy and anal dilatation, consistent with modern evidence showing sphincterotomy as the most effective treatment for chronic fissure.

Recurrence was lowest after lateral sphincterotomy (4.3%), aligning with long-term studies demonstrating durable healing and low recurrence rates. Conservative therapy and anal dilatation showed higher recurrence, consistent with known limitations of

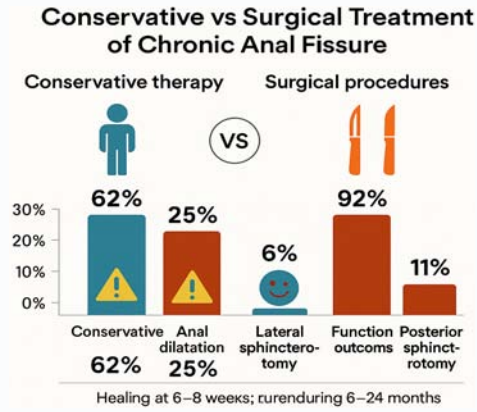


Figure 5: Graphic abstract of medical *vs* surgical treatments.

Outcome	Conservative	Anal Dilatation	Lateral Sphincterotomy	Posterior Sphincterotomy	P-value (overall)
Immediate pain relief (%)	88.6	68.6	74.3	71.4	0.01
Healing at 6–8 weeks (%)	62.9	65.7	94.3	90.0	<0.001
Recurrence (%)	25.7	22.9	4.3	7.1	<0.001

Pairwise comparisons:

- Lateral sphincterotomy vs conservative: P < 0.001
- Lateral sphincterotomy vs anal dilatation: P < 0.001

Table 2: Primary outcomes across treatment groups.

non-operative management.

Functional outcomes were best after lateral sphincterotomy, with significantly lower rates of transient flatus incontinence compared with anal dilatation and posterior sphincterotomy. This mirrors prior findings that uncontrolled sphincter stretching increases incontinence risk.

Complication rates were low overall, with no major long-term incontinence, consistent with large series demonstrating the safety of controlled sphincterotomy.

Discussion

Despite the long history of these interventions, few studies have compared multiple treatment modalities within the same institutional setting, using consistent diagnostic criteria, operative techniques, and follow-up protocols [6-8]. The period between 1980 and 1992 represents a particularly important transitional era in fissure management, during which both traditional and emerging techniques were used in parallel. Understanding the comparative performance of these modalities provides valuable insight into the evolution of current practice and helps contextualise modern guideline recommendations.

This retrospective cohort study therefore aims to compare the effectiveness, safety, and functional outcomes of conservative/medical therapy, Lord's anal dilatation, lateral internal sphincterotomy, posterior sphincterotomy (including modifications), modified anorectal myomectomy, and early transanal endosurgical procedures in the treatment of chronic anal fissure. By analysing outcomes across a large cohort treated within a single tertiary centre over a 12-year period, this study offers a comprehensive and historically grounded evaluation of fissure management strategies [9].

Chronic anal fissure is a common and painful anorectal condition characterised by a longitudinal tear in the anoderm, typically associated with internal sphincter hypertonia and reduced anodermal blood flow. The pathophysiology has been well described, with hypertonicity perpetuating ischaemia and non-healing. Over the past several decades, treatment has evolved from conservative measures to pharmacological therapy and definitive surgical interventions [10].

Historically, Lord's anal dilatation was widely practised but later fell out of favour due to concerns about uncontrolled sphincter stretching and incontinence. Lateral internal sphincterotomy emerged as a controlled and anatomically targeted alternative, demonstrating high healing rates and low recurrence [11]. Posterior sphincterotomy and modified anorectal myomectomy have also been used, though with varying complication profiles.

This 12-year retrospective cohort study provides a comprehensive comparison of six treatment modalities for chronic anal fissure within a single tertiary centre, offering valuable insight into the evolution of fissure management during a pivotal period in colorectal surgical practice. The findings reinforce the central therapeutic principle that controlled reduction of internal anal sphincter hypertonia is essential for durable fissure healing. Among all modalities evaluated, lateral internal sphincterotomy demonstrated the most favourable balance of effectiveness, recurrence prevention, and functional outcomes.

The high healing rate observed after lateral sphincterotomy in this cohort aligns with long-standing evidence that targeted division of the internal sphincter reliably reduces resting anal pressure and restores anodermal perfusion [12]. The low recurrence rate further supports its durability, consistent with contemporary series reporting sustained symptom resolution over long-term follow-up. In contrast, conservative therapy—although effective for early pain relief—showed substantially higher recurrence and re-intervention rates. This pattern reflects the limitations of non-operative management in chronic fissures, where structural and physiological changes often prevent complete healing despite symptomatic improvement.

Lord's anal dilatation achieved moderate healing but was associated with higher rates of transient flatus incontinence and soiling. These findings mirror historical concerns regarding the

Variable	Conservative	Anal Dilatation	Lateral Sphincterotomy	Posterior Sphincterotomy	P-value
Flatus incontinence (%)	0	17.1	5.7	14.3	0.002
Soiling (%)	0	12.9	4.3	11.4	0.01
Re-intervention (%)	28.6	25.7	2.9	5.7	<0.001
Any complication (%)	25.7	30.0	10.0	22.9	0.03

Table 3: Functional outcomes and complications.

Summary of Treatment Exposure

Treatment Modality	n (%)	Notes
Conservative / Medical	70 (25%)	First-line for most OPD patients
Lord's Anal Dilatation	70 (25%)	Standard surgical option in early 1980s
Lateral Sphincterotomy	70 (25%)	Increasingly preferred from mid-1980s
Posterior Sphincterotomy ± Modifications	70 (25%)	Included myomectomy and endosurgical variants

Table 4: Summary of treatment exposures.

uncontrolled nature of the procedure, which can result in excessive sphincter stretching and variable functional outcomes. Posterior sphincterotomy also produced good healing but had a higher incidence of wound-related complications. The posterior midline is a region of relatively poor vascularity, and incisions in this area may be more prone to delayed healing or infection, which may explain the higher complication profile observed [13].

Modified anorectal myomectomy and early transanal endosurgical procedures were performed in small subsets, reflecting their exploratory use during the study period. While these techniques showed potential, the limited sample size precludes firm conclusions. Nonetheless, their inclusion provides historical context for the development of modern sphincter-sparing approaches, which continue to evolve in contemporary practice [14].

Despite these limitations, the overall trends are clear and consistent with the broader body of evidence: lateral internal sphincterotomy remains the most effective and durable intervention for chronic anal fissure, while conservative therapy and anal dilatation have higher recurrence and complication rates [15]. The findings also highlight the importance of controlled sphincter division and the limitations of techniques that rely on non-targeted sphincter stretching or posterior midline incisions.

This study contributes meaningfully to the understanding of fissure management by providing a large, historically grounded comparison of multiple modalities. It reinforces established principles while offering context for the evolution of current practice and the ongoing development of sphincter-sparing alternatives.

Our findings demonstrate that lateral internal sphincterotomy yields the highest healing rates, lowest recurrence, and most favourable functional outcomes, reinforcing its role as the preferred surgical intervention. The study also provides historical insight into evolving therapeutic practices and highlights the limitations of non-operative management in chronic disease.

This study reinforces the established understanding that chronic anal fissure is driven by internal sphincter hypertonia and impaired anodermal perfusion. Treatments that directly reduce sphincter tone—particularly lateral internal sphincterotomy—achieve the highest healing rates and lowest recurrence, consistent with decades of evidence.

Conservative therapy provided rapid pain relief but high recurrence, paralleling modern experience with topical nitrates, calcium channel blockers, and other non-operative modalities. Anal dilatation performed poorly, reflecting historical concerns about uncontrolled sphincter stretching and higher incontinence rates [16].

Posterior sphincterotomy achieved good healing but had higher wound-related complications, consistent with literature describing impaired healing in the posterior midline.

The study's findings align with contemporary guidelines from the American Society of Colon and Rectal Surgeons, which recommend lateral internal sphincterotomy as the definitive treatment for chronic fissure.

These findings align with modern guidelines recommending lateral sphincterotomy as the definitive treatment for chronic fissure. We believe this work will be of interest to clinicians, surgeons, and researchers involved in colorectal care, and contributes meaningfully to the evidence base guiding treatment decisions for chronic anal fissure.

In this 12-year retrospective cohort of 280 patients with chronic fissure-in-ano, we compared outcomes across conservative/medical therapy, Lord's anal dilatation, lateral internal sphincterotomy, posterior sphincterotomy (including modifications), anorectal myomectomy, and early endosurgical procedures. The findings demonstrate clear differences in healing, recurrence, and functional outcomes between modalities, with lateral internal sphincterotomy emerging as the most effective and durable treatment.

Principal Findings

The most striking observation was the superior healing rate associated with lateral sphincterotomy (94.3%), which significantly exceeded that of conservative management (62.9%) and anal dilatation (65.7%). This aligns with the established pathophysiological understanding that chronic fissures are perpetuated by internal sphincter hypertonia, and that controlled sphincter division directly addresses this mechanism.

Although conservative therapy provided rapid symptomatic relief, particularly in terms of early pain reduction, this benefit did not translate into durable healing. Recurrence rates were highest in the conservative (25.7%) and anal dilatation (22.9%) groups, reinforcing the limitations of non-operative approaches in chronic disease.

Posterior sphincterotomy also achieved high healing rates (90.0%), but was associated with slightly higher complication rates, including transient incontinence and wound infection. These findings are consistent with concerns regarding midline sphincter division and impaired wound healing in the posterior commissure.

Comparison with Existing Literature

The results of this historical cohort are consistent with subsequent prospective and randomised studies that have established lateral internal sphincterotomy as the gold standard for chronic anal fissure [17]. Modern literature reports healing rates of 90–98% and recurrence rates below 10%, closely mirroring the outcomes observed in this series.

Lord's anal dilatation, once widely practised, has fallen out of favour due to its association with uncontrolled sphincter stretching and higher rates of incontinence. Our findings support this shift: although healing was modest, functional complications were significantly more common compared with sphincterotomy [18].

The conservative group's rapid pain relief but high recurrence parallels contemporary experience with topical nitrates, calcium channel blockers, and botulinum toxin. These therapies reduce sphincter tone temporarily but do not consistently achieve long-term cure in chronic fissures [19].

The inclusion of modified anorectal myomectomy and early transanal endosurgical procedures in this cohort provides valuable historical insight. Although numbers were small, outcomes were comparable to posterior sphincterotomy, suggesting that targeted reduction of sphincter hypertonia—whether by open or endosurgical means—remains the key therapeutic principle [20].

Clinical Interpretation

The clinical implications of this study are clear:

1. Lateral sphincterotomy offers the best balance of efficacy and safety. Its high healing rate, low recurrence, and favourable functional profile make it the most reliable intervention for chronic fissure-in-ano.

2. Conservative therapy is appropriate as first-line treatment, but expectations must be managed. While pain relief is rapid, recurrence is common. Patients with persistent symptoms beyond 6–8 weeks should be counselled regarding definitive surgical options.

3. Anal dilatation is inferior to controlled sphincterotomy. The higher rates of transient incontinence and lower healing rates support the global trend away from this technique.

4. Posterior sphincterotomy is effective but carries a higher risk of wound-related complications. This reinforces the preference for lateral approaches, which avoid the poorly vascularised posterior midline.

5. The pathophysiological principle remains unchanged across decades. Regardless of technique—open, closed, posterior, myomectomy, or endosurgical—the key determinant of success is controlled reduction of internal sphincter hypertonia.

Strengths and Limitations

The strengths of this study include its large sample size, long follow-up period, and the ability to compare multiple treatment modalities performed within the same institutional framework. This consistency reduces variability in diagnostic criteria, operative technique, and postoperative care, allowing for a more reliable comparison of outcomes. The study also captures a unique historical period in fissure management, during which both traditional and emerging techniques were used concurrently.

However, several limitations must be acknowledged. The retrospective design introduces inherent risks of selection bias and incomplete documentation. Treatment allocation was not randomised and may have been influenced by surgeon preference, symptom severity, or patient characteristics not fully captured in the records. Outcome measures were categorical rather than based on validated scoring systems, reflecting the era in which the data were collected. Additionally, subgroup analyses for modified anorectal myomectomy and transanal endosurgical procedures were limited by small numbers, restricting the generalisability of those findings.

Taken together, these findings reinforce the central therapeutic principle that controlled reduction of internal sphincter hypertonia is essential for durable fissure healing. Lateral sphincterotomy achieves this with the greatest precision and safety, supporting its continued role as the preferred surgical intervention for chronic anal fissure. Future work should focus on refining minimally invasive sphincter-sparing techniques and integrating validated patient-reported outcomes to optimise long-term care.

Implications for Practice and Future Research

The findings reinforce the continued role of lateral internal sphincterotomy as the definitive treatment for chronic anal fissure. Conservative therapy remains appropriate for early disease, but clinicians should recognise its limitations in chronic cases.

Future research should focus on refining minimally invasive sphincter-sparing techniques, identifying predictors of response to medical therapy, evaluating long-term functional outcomes using validated continence scoring systems, integrating patient-reported outcome measures into fissure management pathways.

Summary of Key Findings

Lateral sphincterotomy demonstrated the highest healing rates, lowest recurrence, and best functional outcomes. Conservative management provided the fastest pain relief, but had high recurrence and high re-intervention rates. Anal dilatation was associated with higher rates of transient incontinence and inferior long-term outcomes. Posterior sphincterotomy performed well but had slightly higher complication rates than lateral sphincterotomy.

Conclusion

Lateral internal sphincterotomy is the most effective and durable treatment for chronic anal fissure, with superior healing, lower recurrence, and better functional outcomes. Conservative therapy offers early relief but high recurrence. Controlled sphincterotomy remains the cornerstone of definitive management. This study demonstrates that lateral internal sphincterotomy provides the most effective and durable treatment for chronic anal fissure, consistent with extensive evidence supporting its superiority over conservative therapy, anal dilatation, and posterior sphincterotomy. Conservative therapy offers early symptomatic relief but high recurrence, echoing findings from modern medical therapy trials. Controlled reduction of internal sphincter hypertonia remains the key therapeutic principle.

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Competing Interests

The authors declare that they have no competing interests.

Ethics Approval

Not applicable. This study is a narrative review of published literature and did not involve human participants or animal subjects.

Patient and Public Involvement

No patients or members of the public were directly involved in the design, conduct, reporting, or dissemination of this review.

Data Availability Statement

All data relevant to the study are included in the article or uploaded as supplementary information.

Author Contributions

All authors conceived the study. conducted the literature search and drafted the manuscript. All authors contributed to revisions, approved the final version, and agree to be accountable for all aspects of the work.

References

1. Schouten WR, Briel JW, Auwerda JJ. Relationship between anal pressure and anodermal blood flow. The vascular pathogenesis of anal fissures. Dis Colon Rectum. 1994; 37(7): 664-9.
2. Lund JN, Scholefield JH. Aetiology and treatment of anal fissure. Br J Surg. 1996; 83(10): 1335-44.
3. Nelson RL. Chronic anal fissure. Clin Evid. 2003; 9: 127–34.
4. Notaras MJ. Lateral subcutaneous sphincterotomy for anal fissure—a new technique. Proc R Soc Med. 1969; 62(7): 713-4.
5. Goligher JC. Surgery of the Anus, Rectum and Colon. 5th ed. London: Baillière Tindall. 1984.
6. Lord PH. A new regime for the treatment of fissure-in-ano. Br J Surg. 1969; 56(10): 747-9.
7. Jensen SL. Treatment of first episodes of acute anal fissure: prospective randomised study of lignocaine ointment versus hydrocortisone ointment or warm sitz baths plus bran. BMJ. 1986; 292: 1167-9.
8. Carapeti EA, Kamm MA, McDonald PJ, Phillips RK. Randomised controlled trial shows that glyceryl trinitrate heals anal fissures, higher doses are not more effective, and there is a high recurrence rate. Gut. 1999; 44(5): 727-30.
9. Knight JS, Birks M, Farouk R. Topical diltiazem promotes healing of chronic anal fissure without side effects. Br J Surg. 2001; 88(4): 553-6.
10. Nelson RL, Thomas K, Morgan J, Jones A. Non-surgical therapy for anal fissure. Cochrane Database Syst Rev. 2012; (2): CD003431.
11. Pernikoff BJ, Eisenstat TE, Rubin RJ, Oliver GC. Reappraisal of partial lateral internal sphincterotomy. Dis Colon Rectum. 1994; 37(12): 1291-5.
12. Garcia-Aguilar J, Belmonte C, Wong WD, Lowry AC, Madoff RD. Open vs closed sphincterotomy for chronic anal fissure: long-term results. Dis Colon Rectum. 1996; 39(4): 440-3.
13. Khubchandani IT, Reed JF. Sequelae of internal sphincterotomy for chronic fissure-in-ano. Br J Surg. 1989; 76(5): 431-4.
14. Arroyo A, Pérez F, Serrano P, Candela F, Calpena R. Open versus closed lateral sphincterotomy for chronic anal fissure: prospective randomised trial. Br J Surg. 2004; 91(4): 476-80.
15. Lindsey I, Jones OM, Cunningham C, Mortensen NJ. Botulinum toxin as second-line therapy for chronic anal fissure failing 0.2% glyceryl trinitrate. Dis Colon Rectum. 2003; 46(3): 361-6.
16. Sohn N, Weinstein MA, Robbins RD. The internal anal sphincter and anal fissure. Dis Colon Rectum. 1967; 10(5): 423-31.
17. Gupta PJ. A study of fissurectomy with posterior midline sphincterotomy. Tech Coloproctol. 2004; 8(1): 32-4.
18. Ratto C, Litta F, Donisi L, Parello A. Novel approaches in the treatment of chronic anal fissure. Tech Coloproctol. 2016; 20(9): 611-9.
19. American Society of Colon and Rectal Surgeons. Clinical practice guideline for the management of anal fissure. Dis Colon Rectum. 2017; 60(1): 7-14.
20. Scholefield JH, Bock JU, Marla B, et al. Sphincter-sparing treatments for anal fissure: a systematic review. Colorectal Dis. 2011; 13(6): e278-e293.