

Anal fissure (chronic)

Search date January 2014

Richard L. Nelson

ABSTRACT

INTRODUCTION: Anal fissures are a common cause of anal pain during, and for 1 to 2 hours after, defecation. The cause is not fully understood, but low intake of dietary fibre may be a risk factor. **METHODS AND OUTCOMES:** We conducted a systematic review and aimed to answer the following clinical question: What are the effects of surgical treatments for chronic anal fissure? We searched: Medline, Embase, The Cochrane Library, and other important databases up to January 2014 (Clinical Evidence reviews are updated periodically; please check our website for the most up-to-date version of this review). We included harms alerts from relevant organisations such as the US Food and Drug Administration (FDA) and the UK Medicines and Healthcare products Regulatory Agency (MHRA). **RESULTS:** We found nine studies that met our inclusion criteria. We performed a GRADE evaluation of the quality of evidence for interventions. **CONCLUSIONS:** In this systematic review, we present information relating to the effectiveness and safety of the following interventions: anal advancement flap, anal stretch/dilation, and internal anal sphincterotomy.

QUESTIONS	
What are the effects of surgical treatments for chronic anal fissure?	3

INTERVENTIONS	
SURGICAL TREATMENTS	
<p>Beneficial</p> <p>Internal anal sphincterotomy (more effective than nitric oxide donors, botulinum A toxin-haemagglutinin complex, calcium channel blockers, or anal stretch)</p>	<p>Unknown effectiveness</p> <p>Anal advancement flap (limited evidence that as effective as internal anal sphincterotomy based on one small RCT)</p>
	<p>Unlikely to be beneficial</p> <p>Anal stretch (less effective than internal anal sphincterotomy)</p>

Key points

- Chronic anal fissures typically occur in the midline, with visible sphincter fibres at the fissure base, anal papillae, sentinel piles, and indurated margins.
 - Anal fissures are a common cause of anal pain during, and for 1 to 2 hours after, defecation. The cause is not fully understood, but low intake of dietary fibre may be a risk factor.
 - Chronic fissures typically have a cyclical history of intermittent healing and recurrence, but about 35% will eventually heal, at least temporarily, without intervention.
 - Atypical features, such as multiple, large, or irregular fissures, or those not in the midline, may indicate underlying malignancy, sexually transmitted infections, inflammatory bowel disease, or trauma.
- Internal anal sphincterotomy** is more effective than medical therapy for chronic anal fissure in adults. It improves fissure healing compared with treatment with nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate), **botulinum A toxin-haemagglutinin complex**, and calcium channel blockers (nifedipine, diltiazem).
 - Internal anal sphincterotomy also increases fissure healing compared with digital **anal stretch**, and anal stretch is more likely to cause flatus incontinence. One small RCT found limited evidence that controlled anal dilation may be equivalent to sphincterotomy in fissure healing, with negligible incontinence risk.
 - We don't know whether anal dilation is more effective than topical glyceryl trinitrate at reducing the proportion of people with anal fissure.
 - We don't know whether internal anal sphincterotomy is better or worse than **anal advancement flap** in improving fissure healing.
 - Open partial lateral internal anal sphincterotomy may be equivalent to closed partial internal anal sphincterotomy in fissure healing.
 - Longer internal anal sphincter division (to the dentate line, as opposed to the fissure apex only) may be more effective at reducing anal fissure.
- The risk of minor flatus or faecal incontinence is greater with internal anal sphincterotomy than with botulinum toxin. Topical glyceryl trinitrate increases the risk of headache compared with internal anal sphincterotomy.
- Post-surgical faecal incontinence may be confused with post-surgical leakage (a short-term adverse effect). Confirming post-surgical leakage requires long-term follow-up (at least 12 months).

Clinical context

DEFINITION	An anal fissure is an ulcer or tear in the squamous epithelium of the distal anal canal, usually in the posterior midline. People with an anal fissure usually experience pain during defecation and for 1 to 2 hours afterwards. Multiple fissures and large, irregular, or large and irregular fissures, or fissures off the midline are considered atypical. Atypical fissures may be caused by malignancy, chemotherapy, STIs, inflammatory bowel disease, or other traumas. Treatments for atypical fissures are not included in this review. It is not clear what the best treatment strategy is in people who present with a painless anal fissure and in whom an atypical aetiology has been ruled out. Acute anal fissures have sharply demarcated, fresh mucosal edges, often with granulation tissue at the base. Acute fissures are believed to often heal spontaneously. Chronic anal fissures Fissures persisting for longer than 4 weeks, or recurrent fissures, are generally defined as chronic. Chronic anal fissures have distinct anatomical features, such as visible sphincter fibres at the fissure base, anal papillae, sentinel piles, and indurated margins. ^[1] Most published studies only require the presence of one of these signs or symptoms of chronicity to classify a fissure as chronic. ^[2] This review deals only with chronic anal fissures.
INCIDENCE/ PREVALENCE	Anal fissures are a common cause of anal pain in all age groups, but we found no reliable evidence about precise incidence.
AETIOLOGY/ RISK FACTORS	The cause of anal fissure is not fully understood. Low intake of dietary fibre may be a risk factor for the development of acute anal fissure. ^[3] People with anal fissure often have raised resting anal canal pressures with anal spasm, which may give rise to ischaemia. ^{[1] [4] [5]}
PROGNOSIS	Chronic anal fissure typically has a cyclical pain history, with intermittent healing and then recurrence. One systematic review found healing rates of about 35% without intervention, depending on the length of study follow-up. ^[1]
AIMS OF INTERVENTION	To relieve symptoms (pain, bleeding, and irritation); to heal the fissure; to minimise adverse effects of treatment.
OUTCOMES	Fissure healing, persistence, or recurrence proportion of people with fissure healing, persistence, or fissure recurrence; Symptom improvement symptom score for intensity of symptoms of pain, bleeding, and irritation (typically a linear visual analogue scale that consists of an unmarked 100-mm horizontal line, the left end of which represents absence of symptoms, and the right end of which represents the worst symptoms imaginable; a vertical mark is made across this line by the person with the fissure); Adverse effects . Studies of treatments for anal fissure should have reasonable follow-up periods because late recurrence after treatment is very common (>50% in some studies). ^{[6] [7] [8] [9] [10]} Few published studies have sufficient follow-up to determine their efficacy in preventing recurrence of chronic anal fissure. Faecal incontinence requires long-term follow-up (at least 12 months); ascertainment is complicated by confusion of post-surgical leakage (short-term adverse effect) with faecal incontinence. Headache is a common adverse effect of nitric oxide donor treatment.
METHODS	<i>Clinical Evidence</i> search and appraisal January 2014. The following databases were used to identify studies for this systematic review: Medline 1966 to January 2014, Embase 1980 to January 2014, and The Cochrane Database of Systematic Reviews, issue 1, 2014 (1966 to date of issue). Additional searches were carried out in the Database of Abstracts of Reviews of Effects (DARE) and Health Technology Assessment (HTA) database. We also searched for retractions of studies included in the review. An information specialist identified titles and abstracts in an initial search, which an evidence scanner then assessed against predefined criteria. An evidence analyst then assessed full texts for potentially relevant studies against predefined criteria. An expert contributor was consulted on studies selected for inclusion. An evidence analyst then extracted all data relevant to the review. Study design criteria for inclusion in this review were: published RCTs and systematic reviews of RCTs in the English language, any level of blinding, containing at least 20 individuals (at least 10 in each arm), of whom at least 80% were followed up. There was no minimum length of follow-up but outcomes at 1 year were preferentially reported. We included RCTs and systematic reviews of RCTs where harms of an included intervention were assessed, applying the same study design criteria for inclusion as we did for benefits. In addition, we use a regular surveillance protocol to capture harms alerts from organisations such as the FDA and the MHRA, which are added to the reviews as required. To aid readability of the numerical data in our reviews, we round many percentages to the nearest whole number. Readers should be aware of this when relating percentages to summary statistics such as relative risks (RRs) and odds ratios (ORs). We have performed a GRADE evaluation of the quality of evidence for interventions included in this review (see table, p 17). The categorisation of the quality of the evidence (high, moderate, low, or very low) reflects

the quality of evidence available for our chosen outcomes in our defined populations of interest. These categorisations are not necessarily a reflection of the overall methodological quality of any individual study, because the Clinical Evidence population and outcome of choice may represent only a small subset of the total outcomes reported, and population included, in any individual trial. For further details of how we perform the GRADE evaluation and the scoring system we use, please see our website (www.clinicalevidence.com).

QUESTION What are the effects of surgical treatments for chronic anal fissure?

OPTION ANAL ADVANCEMENT FLAP

- For GRADE evaluation of interventions for Anal fissure (chronic), see table, p 17 .
- We don't know how effective anal advancement flap and internal anal sphincterotomy are, compared with each other, at increasing the proportion of people with healed anal fissures at 3 months.

Benefits and harms

Anal advancement flap versus internal anal sphincterotomy:

See option on Internal anal sphincterotomy, p 4 .

Comment: Anal advancement flap is used to treat some atypical fissures such as those caused by herpes or HIV, wherein any degree of sphincterotomy is generally felt to be unwise. However, there are no RCTs comparing anal advancement flap with more conservative interventions in the setting of atypical chronic anal fissure.

OPTION ANAL STRETCH/DILATION

- For GRADE evaluation of interventions for Anal fissure (chronic), see table, p 17 .
- We don't know whether anal dilation/anal stretch is more effective than topical glyceryl trinitrate at reducing the proportion of people with anal fissure. Topical glyceryl trinitrate increases the risk of headache.
- Anal stretch may be less effective than internal anal sphincterotomy at reducing the proportion of people with anal fissure. However, the significance of the result depended on the analysis performed.
- The risk of flatus incontinence may be greater with anal stretch than with internal anal sphincterotomy.
- We don't know whether pneumatic balloon dilation or controlled-intermittent anal dilation is more effective than internal anal sphincterotomy in reducing the proportion of people with anal fissure.
- One small RCT found limited evidence that controlled-intermittent anal dilation may be equivalent to sphincterotomy in fissure healing, with negligible incontinence risk.

Benefits and harms

Anal stretch/dilation versus nitric oxide donors (topical glyceryl trinitrate):

We found one systematic review (search date 2010),^[11] which included one RCT that met our inclusion criteria.^[12]


Fissure healing, persistence, or recurrence

Anal stretch/dilation versus nitric oxide donors (topical glyceryl trinitrate) We don't know whether anal dilation is more effective than topical glyceryl trinitrate at reducing the persistence of anal fissure because outcomes were not reported beyond 30 days in this small RCT (very low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
^[11] Systematic review	36 people with chronic anal fissure Data from 1 RCT	Non-healing of anal fissure (persistence or recurrence) 1/18 (6%) with anal dilation	OR 0.04 95% CI 0.00 to 0.35	●●●	anal dilation

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		11/18 (61%) with topical glyceryl trinitrate	See Further information on studies		

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[11] Systematic review	36 people with chronic anal fissure Data from 1 RCT	Headache 0/18 (0%) with anal dilation 7/18 (39%) with topical glyceryl trinitrate	OR 24.13 95% CI 1.26 to 463.72 See Further information on studies		anal dilation

Anal stretch/dilation versus anal sphincterotomy:

See option on Internal anal sphincterotomy, p 4

Further information on studies

[12] A small RCT where the level of blinding was unclear, outcomes were not reported beyond 30 days, and method of randomisation and allocation concealment was unclear (randomisation by secretarial staff, further details not reported).

Comment: The key study, an RCT comparing the old digital stretch with balloon dilation, has not been conducted. Although there are no RCT data, there is a presumption that balloon dilation may be more effective because it gives rise to uniform application of pressure to the anal sphincter, and requires reduced anal opening. More importantly, balloon dilation has not been associated with incontinence.

OPTION INTERNAL ANAL SPHINCTEROTOMY

- For GRADE evaluation of interventions for Anal fissure (chronic), see table, p 17 .
- **Internal anal sphincterotomy** is more effective than medical therapy for chronic anal fissure in adults. It improves fissure healing compared with treatment with topical nitric oxide donors (**glyceryl trinitrate**, isosorbide dinitrate), **botulinum A toxin-haemagglutinin complex**, and calcium channel blockers (nifedipine, diltiazem).
- Internal anal sphincterotomy also increases fissure healing compared with **anal stretch**, and anal stretch is more likely to cause flatus incontinence. One small RCT found limited evidence that controlled anal dilation may be equivalent to sphincterotomy in fissure healing, with negligible incontinence risk.
- The risk of minor flatus or faecal incontinence is greater with internal anal sphincterotomy than with botulinum toxin. Topical glyceryl trinitrate increases the risk of headache compared with internal anal sphincterotomy.
- The risk of flatus incontinence may be greater with anal stretch than with internal anal sphincterotomy.
- We don't know whether internal anal sphincterotomy is better or worse than **anal advancement flap** in improving fissure healing.
- Longer internal anal sphincter division (to the dentate line as opposed to the fissure apex only) may be more effective at reducing the proportion of people with anal fissure.
- Open partial lateral internal anal sphincterotomy may be equivalent to closed partial internal anal sphincterotomy in fissure healing.



Benefits and harms

Internal anal sphincterotomy versus nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate):

We found one systematic review (search date 2010), ^[11] which included seven RCTs that met our inclusion criteria. ^{[13] [14] [15] [16] [17] [18] [19]} We found one further RCT, ^[20] and one subsequent RCT. ^[21]


Fissure healing, persistence, or recurrence

Internal anal sphincterotomy compared with nitric oxide donors Internal anal sphincterotomy seems to be more effective than nitric oxide donors (glyceryl trinitrate or isosorbide mononitrate) at reducing the proportion of people with anal fissure at 6 weeks to 2 years (**high-quality evidence**).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
^[11] Systematic review	407 people with chronic anal fissure 7 RCTs in this analysis	Non-healing of anal fissure (persistence or recurrence) , 4 weeks–2 years 25/204 (12%) with lateral internal sphincterotomy 92/203 (45%) with nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate)	OR 7.49 95% CI 4.29 to 13.07 P <0.00001		lateral internal sphincterotomy
^[20] RCT 4-armed trial	160 people with chronic anal fissure	Recurrence , up to 5 years 4/40 (10%) with open lateral internal sphincterotomy 23/40 (58%) with topical glyceryl trinitrate The remaining arms evaluated topical diltiazem and botulinum toxin	Not reported		
^[21] RCT	207 people with chronic anal fissure	Healing , 1 year 98/102 (96%) with lateral internal sphincterotomy 76/105 (72%) with topical isosorbide dinitrate	P <0.001		lateral internal sphincterotomy

Symptom improvement

Internal anal sphincterotomy compared with nitric oxide donors Internal anal sphincterotomy may be more effective at reducing time to complete pain relief than nitric oxide donors (topical glyceryl trinitrate) (**low-quality evidence**).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Symptom improvement					
^[20] RCT 4-armed trial	160 people with chronic anal fissure	Mean time to complete pain relief (pain assessed daily using visual analogue scale) 5.7 days (40 people) with open lateral internal sphincterotomy 15.6 days (40 people) with topical glyceryl trinitrate The remaining arms evaluated topical diltiazem and botulinum toxin	P <0.001		lateral internal sphincterotomy

No data from the following reference on this outcome. ^{[11] [21]}

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[11] Systematic review	384 people with chronic anal fissure 7 RCTs in this analysis	Minor flatus or faecal incontinence , 4 weeks–2 years 15/191 (8%) with lateral internal sphincterotomy 7/193 (4%) with nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate)	OR 0.51 95 % CI 0.22 to 1.16 P = 0.11	↔	Not significant
[11] Systematic review	381 people with chronic anal fissure	Headache , 4 weeks–2 years 2/191 (1%) with lateral internal sphincterotomy 66/190 (35%) with nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate) See Further information on studies	OR 29.06 95 % CI 10.30 to 82.04 P <0.00001	● ● ●	lateral internal sphincterotomy
[20] RCT 4-armed trial	160 people with chronic anal fissure	Flatus incontinence 2/40 (5%) with open lateral internal sphincterotomy 0/40 (0%) with topical glyceryl trinitrate The remaining arms evaluated topical diltiazem and botulinum toxin	Not reported		
[20] RCT 4-armed trial	160 people with chronic anal fissure	Headache 0/40 (0%) with open lateral internal sphincterotomy 6/40 (15%) with topical isosorbide dinitrate The remaining arms evaluated topical diltiazem and botulinum toxin	Not reported		
[21] RCT	207 people with chronic anal fissure	Moderate anal incontinence 6/102 (6%) with lateral internal sphincterotomy 0/105 (0%) with topical isosorbide dinitrate ointment	Not reported		
[21] RCT	207 people with chronic anal fissure	Headache , 1 year 0/102 (0%) with lateral internal sphincterotomy 7/105 (7%) with topical isosorbide dinitrate ointment	Not reported		

Internal anal sphincterotomy versus botulinum A toxin-haemagglutinin complex:

We found one systematic review (search date 2010), [11] which included five RCTs that met our inclusion criteria. [22] [23] [24] [25] [26] We found one further RCT, [20] and two subsequent RCTs. [27] [28]

Fissure healing, persistence, or recurrence

Internal anal sphincterotomy compared with botulinum A toxin-haemagglutinin complex Internal anal sphincterotomy is more effective than botulinum A toxin-haemagglutinin at reducing non-healing of anal fissure at 18 weeks to 3 years ([high-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
[11] Systematic review	365 people with chronic anal fissure 5 RCTs in this analysis	Non-healing of anal fissure , 18 weeks–3 years 19/177 (11%) with lateral internal sphincterotomy 77/188 (41%) with botulinum toxin	OR 7.20 95% CI 3.97 to 13.07 P <0.00001		lateral internal sphincterotomy
[20] RCT 4-armed trial	160 people with chronic anal fissure	Recurrence , up to 5 years 4/40 (10%) with open lateral internal sphincterotomy 21/40 (53%) with botulinum toxin The remaining arms evaluated topical diltiazem and topical glyceryl trinitrate	Not reported		
[27] RCT	40 people with chronic anal fissure	Persistence or recurrence , 3 years 0/20 (0%) with lateral internal sphincterotomy 7/20 (35%) with botulinum toxin See Further information on studies	P = 0.008		lateral internal sphincterotomy
[28] RCT	50 people with chronic anal fissure	Complete healing of fissure , 12 months 23/25 (92%) with lateral internal sphincterotomy 12/25 (48%) with botulinum toxin	P = 0.001		lateral internal sphincterotomy

Symptom improvement

Internal anal sphincterotomy versus botulinum A toxin-haemagglutinin complex We don't know how effective internal anal sphincterotomy and botulinum A toxin-haemagglutinin complex are, compared with each other, at reducing post-treatment pain ([very low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Symptom improvement					
[20] RCT 4-armed trial	160 people with chronic anal fissure	Mean time to complete pain relief 5.7 days (40 people) with open lateral internal sphincterotomy 2.7 days (40 people) with botulinum toxin Absolute results not reported The remaining arms evaluated topical diltiazem and topical glyceryl trinitrate	Reported as not significant P value not reported		Not significant
[27] RCT	40 people with chronic anal fissure	Pain score , day 7 with lateral internal sphincterotomy with botulinum toxin	P = 0.041		lateral internal sphincterotomy

No data from the following reference on this outcome. ^[11] ^[28]

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
^[11] Systematic review	321 people with chronic anal fissure 4 RCTs in this analysis	Minor flatus or faecal incontinence , 18 weeks–3 years 14/155 (9%) with lateral internal sphincterotomy 0/166 (0%) with botulinum toxin	OR 0.11 95% CI 0.02 to 0.46 P = 0.0028		botulinum toxin
^[20] RCT 4-armed trial	160 people with chronic anal fissure	Flatus incontinence 2/40 (5%) with open lateral internal sphincterotomy 0/40 (0%) with botulinum toxin The remaining arms evaluated topical diltiazem and topical glyceryl trinitrate See Further information on studies	Not reported		
^[27] RCT	40 people with chronic anal fissure	Incontinence 4/20 (20%) with lateral internal sphincterotomy 3/20 (15%) with botulinum toxin	P = 1.000		Not significant
^[28] RCT	50 people with chronic anal fissure	Incontinence , 12 months 1/25 (4%) with lateral internal sphincterotomy 0/25 (0%) with botulinum toxin	P >0.05		Not significant

Internal anal sphincterotomy versus calcium channel blockers:

We found one systematic review (search date 2010), ^[11] which included two RCTs that met our inclusion criteria. ^[29] ^[30] We found one further RCT, ^[20] and one subsequent RCT. ^[31]

Fissure healing, persistence, or recurrence

Internal anal sphincterotomy compared with calcium channel blockers Internal anal sphincterotomy may be more effective than calcium channel blockers (nifedipine, diltiazem) at reducing non-healing of anal fissure at 8 weeks to 4 months; however, we don't know how they compare long term (*low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
^[11] Systematic review	200 people with chronic anal fissure 2 RCTs in this analysis	Non-healing of anal fissure , 8 weeks–4 months 4/124 (3%) with lateral internal sphincterotomy 40/76 (53%) with calcium channel blocker (oral or topical nifedipine)	OR 59.77 95% CI 15.47 to 230.96 P <0.00001 I ² = 64%, P = 0.09 See Further information on studies		lateral internal sphincterotomy

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[20] RCT 4-armed trial	160 people with chronic anal fissure	Recurrence , up to 5 years 4/40 (10%) with open lateral internal sphincterotomy 26/40 (65%) with topical diltiazem The remaining arms evaluated topical glyceryl trinitrate and botulinum toxin	Not reported		
[31] RCT	188 people with chronic anal fissure	Recurrence , 1 year 0/89 (0%) with lateral internal sphincterotomy 26/40 (65%) with topical diltiazem	Not reported		

Symptom improvement

Internal anal sphincterotomy compared with calcium channel blockers Internal anal sphincterotomy may be more effective at reducing time to complete pain relief than calcium channel blockers (topical diltiazem) (low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Symptom improvement					
[20] RCT 4-armed trial	160 people with chronic anal fissure	Mean time to complete pain relief 5.7 days (40 people) with open lateral internal sphincterotomy 15.7 days (40 people) with topical diltiazem The remaining arms evaluated topical glyceryl trinitrate and botulinum toxin	P <0.001	○○○	open lateral internal sphincterotomy

No data from the following reference on this outcome. [11] [31]

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[11] Systematic review	64 people with chronic anal fissure Data from 1 RCT	Incontinence , 8 weeks 4/32 (13%) with lateral internal sphincterotomy 0/32 (0%) with calcium channel blocker (topical nifedipine)	OR 0.10 95% CI 0.01 to 1.89 P = 0.12	↔	Not significant
[11] Systematic review	64 people with chronic anal fissure Data from 1 RCT	Headache , 8 weeks 0/32 (0%) with lateral internal sphincterotomy 5/32 (16%) with calcium channel blocker (topical nifedipine)	OR 13.00 95% CI 0.69 to 245.72 P = 0.087	↔	Not significant
[20] RCT 4-armed trial	160 people with chronic anal fissure	Flatus incontinence 2/40 (5%) with open lateral internal sphincterotomy 0/40 (0%) with topical diltiazem	Not reported		

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		The remaining arms evaluated topical glyceryl trinitrate and botulinum toxin			
[20] RCT 4-armed trial	120 people with chronic anal fissure	Headache 0/40 (0%) with open lateral internal sphincterotomy 2/40 (5%) with topical diltiazem The remaining arms evaluated topical glyceryl trinitrate and botulinum toxin	Not reported		
[31] RCT	188 people with chronic anal fissure	Headache , 6 weeks 0/97 (0%) with lateral internal sphincterotomy 5/91 (5%) with topical diltiazem	P <0.0001		lateral internal sphincterotomy
[31] RCT	188 people with chronic anal fissure	Faecal incontinence , 1 year 0/97 (0%) with lateral internal sphincterotomy 0/91 (0%) with topical diltiazem	No events, effect size not estimable		

Internal anal sphincterotomy versus anal stretch/dilation:

We found one systematic review (search date March 2011), [1] which included nine RCTs (6 RCTs anal stretch, 385 people; 1 RCT anal dilation, 108 people, all manual; 1 RCT pneumatic balloon dilation, 49 people; 1 RCT controlled intermittent anal dilation, 40 people) that met our inclusion criteria. [32] [33] [34] [35] [36] [37] [38] [39] [40]

Fissure healing, persistence, or recurrence

Internal anal sphincterotomy compared with anal stretch/dilation Internal anal sphincterotomy may be more effective than anal stretch at reducing the proportion of people with anal fissure. However, the significance of the result depended upon the analysis performed. We don't know whether internal anal sphincterotomy is more effective than pneumatic balloon dilation or controlled-intermittent anal dilation at reducing the proportion of people with anal fissure ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
[1] Systematic review	493 people with chronic anal fissure 7 RCTs in this analysis	Persistence of anal fissure 18/229 (8%) with internal anal sphincterotomy 29/264 (11%) with anal stretch	OR 1.55 95% CI 0.85 to 2.86 P = 0.16 I ² = 58%, P = 0.03 See Further information on studies		Not significant
[1] Systematic review	328 people with chronic anal fissure 5 RCTs in this analysis Sensitivity analysis excluding two low quality RCTs	Persistence of anal fissure 6/164 (4%) with internal anal sphincterotomy 23/164 (14%) with anal stretch	OR 4.42 95% CI 1.75 to 11.18 P = 0.0017 See Further information on studies		internal anal sphincterotomy
[1] Systematic review	49 people with chronic anal fissure Data from 1 RCT	Treatment failure 3/25 (12%) with lateral internal sphincterotomy	OR 1.47 95% CI 0.29 to 7.37 P = 0.64		Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		4/24 (17%) with pneumatic balloon dilation			
[1] Systematic review	40 people with chronic anal fissure Data from 1 RCT	Treatment failure 3/20 (15%) with lateral internal sphincterotomy 2/20 (10%) with controlled-intermittent anal dilation	OR 0.63 95% CI 0.09 to 4.24 P = 0.63	↔	Not significant

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[1] Systematic review	493 people with chronic anal fissure 7 RCTs in this analysis	Minor flatus incontinence 6/229 (3%) with internal anal sphincterotomy 32/264 (12%) with anal stretch	OR 4.03 95% CI 2.04 to 7.96 P = 0.000062	●●○	internal anal sphincterotomy
[1] Systematic review	49 people with chronic anal fissure Data from 1 RCT	Persistent anal incontinence 4/25 (16%) with lateral internal sphincterotomy 0/24 (0%) with pneumatic balloon dilation	OR 0.10 95% CI 0.00 to 1.92 P = 0.13	↔	Not significant
[1] Systematic review	40 people with chronic anal fissure Data from 1 RCT	Incontinence 0/20 (0%) with lateral internal sphincterotomy 0/20 (0%) with controlled-intermittent anal dilation	No events, effect size not estimable		

Open versus closed internal anal sphincterotomy:

We found one systematic review (search date 2011), [1] which included five RCTs that met our inclusion criteria. [41] [42] [43] [44] [45]

Fissure healing, persistence, or recurrence

Open compared with closed internal anal sphincterotomy We don't know how effective open partial lateral internal anal sphincterotomy and closed partial lateral sphincterotomy are, compared with each other, at reducing the proportion of people with anal fissure (low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
[1] Systematic review	336 people with chronic anal fissure 5 RCTs in this analysis	Persistence of anal fissure 10/168 (6%) with open lateral internal sphincterotomy 10/168 (6%) with closed partial lateral internal sphincterotomy	OR 1.00 95% CI 0.40 to 2.48 P = 1.00	↔	Not significant

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[1] Systematic review	336 people with chronic anal fissure 5 RCTs in this analysis	Minor flatus incontinence 15/168 (9%) with open lateral internal sphincterotomy 17/168 (10%) with closed partial lateral internal sphincterotomy	OR 0.87 95% CI 0.41 to 1.83 P = 0.71	↔	Not significant

Different lengths of internal anal sphincterotomy division versus each other:

We found one systematic review (search date 2011), [1] which examined variation of sphincter division from the length of the fissure to the level of the dentate line. The review included three RCTs that met our inclusion criteria. [46] [47] [48]

Fissure healing, persistence, or recurrence

Different lengths of internal anal sphincter division compared with each other Longer sphincterotomy (to the dentate line as opposed to the fissure apex only) may be more effective at reducing the proportion of people with anal fissure (low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
[1] Systematic review	228 people with chronic anal fissure 3 RCTs in this analysis	Treatment failure 1/114 (1%) with dentate line 11/114 (10%) with fissure apex	OR 0.15 95% CI 0.03 to 0.69 P = 0.015	●●●	dentate line

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[1] Systematic review	138 people with chronic anal fissure 3 RCTs in this analysis	Mean anal incontinence score with dentate line with fissure apex Absolute results not reported	Mean difference -0.10 95% CI -0.34 to +0.14 P = 0.42	↔	Not significant

Internal anal sphincterotomy versus anal advancement flap:

We found one systematic review (search date 2011), [1] which included one RCT that compared internal anal sphincterotomy with anal advancement flap. [49] We have reported results directly from the RCT.

Fissure healing, persistence, or recurrence

Internal anal sphincterotomy compared with anal advancement flap We don't know how effective internal anal sphincterotomy and anal advancement flap are, compared with each other, at increasing the proportion of people with healed anal fissures at 3 months (low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Fissure healing, persistence, or recurrence					
[49] RCT	40 people with chronic anal fissure In review [1]	Anal fissure healing, 3 months 20/20 (100%) with internal anal sphincterotomy 17/20 (85%) with anal advancement flap	P = 0.12	↔	Not significant

Adverse effects

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Adverse effects					
[49] RCT	40 people with chronic anal fissure In review [1]	Incontinence, 3 months 0/20 (0%) with internal anal sphincterotomy 0/20 (0%) with anal advancement flap	Not reported		

Further information on studies

- [1] *Internal anal sphincterotomy versus anal stretch/dilation* There was significant heterogeneity among the RCTs that contributed to the persistence of anal fissure analysis ($I^2 = 58\%$, $P = 0.03$). Sensitivity analysis found that the heterogeneity disappeared ($I^2 = 0\%$, $P = 0.71$) when two of the lower quality RCTs were omitted from the analysis. [34] [38] In one RCT, anal dilation was performed using a pneumatic balloon rather than manually. The level of blinding was not clear; 4/49 (8%) people withdrew from the study. [39] Another RCT reported controlled-intermittent anal dilation performed under general anaesthesia using a repeated dilation-relaxation sequence. [40] *Open versus closed internal anal sphincterotomy* In two of the included RCTs, randomisation was by pulling classification cards once surgery had been determined to be necessary, and in most RCTs the level of blinding was unclear. *Different lengths of internal anal sphincterotomy division versus each other* One RCT (92 people) used an inadequate randomisation method (by hospital number), [46] and the level of allocation concealment and blinding in all three RCTs was not clear.
- [11] *Internal anal sphincterotomy compared with nitric oxide donors* One of the references included in adverse effects (headache, 4 weeks–2 years) compared hydropneumatic anal dilation with topical glyceryl trinitrate. [12] *Internal anal sphincterotomy compared with botulinum A toxin-haemagglutinin complex* One RCT reported that there were no significant differences between treatments in haemorrhage or haematoma (haemorrhage: 1/40 [3%] with sphincterotomy v 1/40 [3%] with botulinum A; $P > 0.05$; haematoma: 1/40 [3%] with sphincterotomy v 1/40 [3%] with botulinum A; P value not reported). [23] Another RCT reported that internal anal sphincterotomy significantly delayed return to daily activities compared with botulinum A toxin-haemagglutinin complex (14.8 days with sphincterotomy v 1.0 day with botulinum A toxin-haemagglutinin complex; $P < 0.0001$). [24] *Internal anal sphincterotomy compared with calcium channel blockers* Substantial heterogeneity ($I^2 = 64\%$) was reported in the meta-analysis for non-healing of anal fissure (8 weeks–4 months). The review raised concerns about quality issues, with one RCT [30] considered to be at high risk of bias due to lack of blinding, high reported cure rates (100% for surgery and >90% for topical nifedipine), with a follow-up period of only 8 weeks. There were substantial problems with compliance in the nifedipine group (17 of 41 patients, 41% dropout rate) of the other RCT [29] related to side-effects, continued anal pain, and slow healing. Also, one RCT reported that more people had adverse effects with nifedipine than with lateral anal sphincterotomy (16/32 [50%] v 6/32 [19%]; significance not reported). Flushing was reported in 5/32 (16%) patients taking nifedipine compared with 0/32 (0%) who underwent surgery. Rates of anal irritation were as follows: 6/32 (19%) with nifedipine versus 2/32 (6%) with lateral internal sphincterotomy. [30]
- [20] *Internal anal sphincterotomy compared with nitric oxide donors* Mean squeeze anal pressure differed significantly between treatment groups at baseline ($P < 0.001$). Patients randomised to open lateral internal sphincterotomy had a mean time to healing of 4.5 weeks compared with 5 weeks for glyceryl trinitrate ointment. Time to healing did not differ significantly between the four treatment groups in the study ($P = 0.067$). The authors report that

both individuals who experienced flatus incontinence became completely continent within 12 weeks. *Internal anal sphincterotomy compared with botulinum A toxin-haemagglutinin complex* Mean squeeze anal pressure differed significantly between treatment groups at baseline ($P < 0.001$). Patients randomised to open lateral internal sphincterotomy had a mean time to healing of 4.5 weeks compared with 5.1 weeks for botulinum toxin. Time to healing did not differ significantly between the four treatment groups in the study ($P = 0.067$). The authors report that both individuals who experienced flatus incontinence became completely continent within 12 weeks. *Internal anal sphincterotomy compared with calcium channel blockers* Mean squeeze anal pressure differed significantly between treatment groups at baseline ($P < 0.001$). Patients randomised to open lateral internal sphincterotomy had a mean time to healing of 4.5 weeks compared with 5.1 weeks with 2% diltiazem ointment. Time to healing did not differ significantly between the four treatment groups in the study ($P = 0.067$). The authors report that both individuals who experienced flatus incontinence became completely continent within 12 weeks.

- [21] The isosorbide dinitrate content of the ointment could be increased from 0.25% to 0.5% if anal fissure had not healed at 4 weeks. Lateral internal sphincterotomy significantly increased the proportion of patients who experienced healing of anal fissure at 4 weeks, 8 weeks, and 6 months compared with isosorbide dinitrate ointment 0.25% ($P < 0.001$). The proportion of patients with recurring anal fissure did not differ significantly between treatment groups at 1 year (1/102 [1%] with lateral internal sphincterotomy v 5/105 [5%] with isosorbide dinitrate ointment; $P = 0.105$). The authors state that all patients who experienced anal incontinence had improved incontinence symptom scores at 6 months.
- [27] Patients randomised to lateral internal sphincterotomy were more likely to experience complete healing of fissure at 12 weeks than those randomised to treatment with botulinum toxin (20/20 [100%] v 15/20 [75%]; $P = 0.047$). Persistence or recurrence was less likely among surgical patients at both 1-year and 2-year follow-up than patients treated with botulinum toxin ($P = 0.047$ and $P = 0.008$, respectively). Incontinence was described as transient.
- [28] At 6 months, persistence or recurrence of fissure was more common among patients treated with botulinum toxin than those who underwent lateral internal sphincterotomy (11/25 [44%] v 3/25 [12%]; $P = 0.005$). Surgical patients were more likely to experience complete healing of fissure at 2 months ($P = 0.001$) and at 6 months ($P = 0.005$), but not at 3 months ($P > 0.05$). Patients who underwent sphincterotomy were more likely to experience anal incontinence at 2 months ($P = 0.005$), 3 months ($P < 0.05$) and 6 months ($P < 0.05$).
- [31] This study reported complete fissure healing rates at 6 weeks of 96% (93/97) with sphincterotomy and 69% (63/91) with topical diltiazem.
- [49] This small trial found no significant difference in patient satisfaction at 3 months (people reporting themselves 'dissatisfied': 3/20 [15%] with internal anal sphincterotomy v 3/20 [15%] with anal advancement flap; people 'satisfied' or reporting the result as 'excellent': 17/20 [85%] with internal anal sphincterotomy v 17/20 [85%] with anal advancement flap; P value not reported).

Comment: Two major outcomes were considered by the review: persistence of the fissure and flatus/faecal incontinence. [1] [11] Post-surgical faecal incontinence may, however, be confused with post-surgical leakage (a short-term adverse effect) and requires substantial follow-up (at least 12 months) to be confirmed. Other outcomes (e.g., complications related to wound healing) are likely to be relevant. The two RCTs removed in the sensitivity analysis of internal anal sphincterotomy compared with anal stretch/dilation had a greater loss to follow-up than the other studies, and length of follow-up varied widely between participants. [34] [38] [40] In one RCT, general anaesthesia was used in the anal stretch/dilation group, whereas internal anal sphincterotomy was performed under local anaesthetic. [1] More evidence is needed to establish effects on fissure healing of anal advancement flap compared with internal anal sphincterotomy. Partial lateral sphincterotomy, open or closed, provides the most reliable long-term cure of anal fissure: it is more effective than any alternative drug treatment. The fear of incontinence has been the cause of increasing use of drug treatment. However, we found no publications on the treatment of internal sphincterotomy-related incontinence, or any publications describing such people seeking treatment. Studies included in the review suggest that sphincterotomy and controlled balloon dilation to at least 30 mm can cure fissure without incontinence risk. Quality-of-life studies suggest a high level of patient satisfaction with sphincterotomy. [50] [51] [52] Sphincterotomy may be offered as a first-line treatment for chronic anal fissure, with the assurance of a 90% chance of permanent cure, or it may be offered as a back-up treatment for those who fail drug treatment.

GLOSSARY

Botulinum A toxin-haemagglutinin complex (botulinum A toxin-hc) A formulation of botulinum A toxin and haemagglutinin for injection. Different preparations are used at different doses for the same indication, and the strength (in units) of one preparation may not be equivalent to that of another preparation labelled as containing the same number of units.

Anal advancement flap A procedure in which the edges of an anal fissure are excised and healthy anal skin is mobilised to cover the defect. This procedure is commonly used for anal ulcers: for example, in people who are HIV-positive.

Anal dilation/anal stretch Stretching as opposed to cutting of the internal anal sphincter. Traditionally, this has been done by insertion of fingers into the anus, but more recently dilators have been used, which may be less traumatic.

High-quality evidence Further research is very unlikely to change our confidence in the estimate of effect.

Internal anal sphincterotomy Incision in the internal anal sphincter, either posteriorly or laterally, but more commonly laterally, and usually "tailored" to the length of the fissure.

Low-quality evidence Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Topical glyceryl trinitrate A formulation usually of 0.2% to 0.4% ointment, applied lightly around the anal opening.

Very low-quality evidence Any estimate of effect is very uncertain.

SUBSTANTIVE CHANGES

Anal advancement flap One systematic review updated. ^[1] No new data added. Categorisation unchanged (unknown effectiveness).

Anal stretch/dilation One systematic review updated. ^[11] No new data added. Categorisation unchanged (unlikely to be beneficial).

Internal anal sphincterotomy One systematic review updated (search date 2010), ^[11] and five subsequent RCTs added. ^{[21] [20] [27] [28] [31]} Categorisation unchanged (beneficial).

REFERENCES

- Nelson RL, Chattopadhyay A, Brooks W, et al. Operative procedures for fissure in ano. In: The Cochrane Library, Issue 1, 2014. Chichester, UK: John Wiley & Sons, Ltd. Search date 2011. [PubMed]
- Goligher JC. Surgery of the anus, rectum and colon. 3rd ed. London: Balliere & Tindall, 1975.
- Jensen SL. Diet and other risk factors for fissure-in-ano. Prospective case control study. *Dis Colon Rectum* 1988;31:770–773. [PubMed]
- Gibbons CP, Read NW. Anal hypertonia in fissures: cause or effect? *Br J Surg* 1986;73:443–445. [PubMed]
- Lund JN, Scholefield JH. Internal sphincter spasm in anal fissure. *Br J Surg* 1997;84:1723–1724. [PubMed]
- Rotholtz NA, Bun M, Mauri MV, et al. Long term assessment of fecal incontinence after lateral internal sphincterotomy. *Tech Coloproctol* 2005;9:115–118. [PubMed]
- Demirbag S, Tander B, Atabek C, et al. Long-term results of topical glyceryl trinitrate ointment in children with anal fissure. *Ann Trop Paediatr* 2005;25:135–137. [PubMed]
- Minguez M, Herreros B, Espi A, et al. Long-term follow-up (42 months) of chronic anal fissure after healing with botulinum toxin. *Gastroenterology* 2002;123:112–117. [PubMed]
- Jonas M, Lund JN, Scholefield JH. Topical 0.2% glyceryl trinitrate ointment for anal fissures: long-term efficacy in routine clinical practice. *Colorectal Dis* 2002;4:317–320. [PubMed]
- Graziano A, Svidler Lopez L, Lencinas S, et al. Long-term results of topical nitroglycerin in the treatment of chronic anal fissures are disappointing. *Tech Coloproctol* 2001;5:143–147. [PubMed]
- Nelson RL, Thomas K, Morgan J, et al. Non surgical therapy for anal fissure. In: The Cochrane Library, Issue 1, 2014. Chichester, UK: John Wiley & Sons, Ltd. Search date 2010. [PubMed]
- Boschetto S, Giovannone M, Tosoni M, et al. Hydropneumatic anal dilation in conservative treatment of chronic anal fissure: clinical outcomes and randomized comparison with topical nitroglycerin. *Tech Coloproctol* 2004;8:89–92. [PubMed]
- Evans J, Luck A, Hewett P. Glyceryl trinitrate vs lateral sphincterotomy for chronic anal fissure: prospective, randomized trial. *Dis Colon Rectum* 2001;44:93–97. [PubMed]
- Libertiny G, Knight JS, Farouk R. Randomised trial of topical 0.2% glyceryl trinitrate and lateral internal sphincterotomy for the treatment of patients with chronic anal fissure: long-term follow-up. *Eur J Surg* 2002;168:418–421. [PubMed]
- Mishra R, Thomas S, Maan MS, et al. Topical nitroglycerin versus lateral internal sphincterotomy for chronic anal fissure: prospective, randomized trial. *ANZ J Surg* 2005;75:1032–1035. [PubMed]
- Oettlé GJ. Glyceryl trinitrate vs. sphincterotomy for treatment of chronic fissure-in-ano: a randomized, controlled trial. *Dis Colon Rectum* 1997;40:1318–1320. [PubMed]
- Parellada C. Randomized, prospective trial comparing 0.2 percent isosorbide dinitrate ointment with sphincterotomy in treatment of chronic anal fissure: a two-year follow-up. *Dis Colon Rectum* 2004;47:437–443. [PubMed]
- Richard CS, Gregoire R, Plewes EA, et al. Internal sphincterotomy is superior to topical nitroglycerin in the treatment of chronic anal fissure: results of a randomized, controlled trial by the Canadian Colorectal Surgical Trials Group. *Dis Colon Rectum* 2000;43:1048–1057. [PubMed]
- Siddique MI, Murshed KM, Majid MA. Comparative study of lateral internal sphincterotomy versus local 0.2% glyceryl trinitrate ointment for the treatment of chronic anal fissure. *Bangladesh Med Res Counc Bull* 2008;34:12–15. [PubMed]
- Abd Elhady HM, Othman IH, Hablus MA, et al. Long-term prospective randomised clinical and manometric comparison between surgical and chemical sphincterotomy for treatment of chronic anal fissure. *S Afr J Surg* 2009;47:112–114. [PubMed]
- Arslian K, Ereno lu B, Do ru O, et al. Lateral internal sphincterotomy versus 0.25% isosorbide dinitrate ointment for chronic anal fissures: a prospective randomized controlled trial. *Surg Today* 2013;43:500–505. [PubMed]
- Arroyo A, Perez F, Serrano P, et al. Surgical versus chemical (botulinum toxin) sphincterotomy for chronic anal fissure: long term results of a prospective randomized clinical and manometric study. *Am J Surg* 2005;189:429–434. [PubMed]
- Iswariah H, Stephens J, Rieger N, et al. Randomized prospective controlled trial of lateral internal sphincterotomy versus injection of botulinum toxin for the treatment of idiopathic fissure in ano. *ANZ J Surg* 2005;75:553–555. [PubMed]
- Mentes BB, Irkorucu O, Akin M, et al. Comparison of botulinum toxin injection and lateral internal sphincterotomy for the treatment of chronic anal fissure. *Dis Colon Rectum* 2003;46:232–237. [PubMed]
- Nasr M, Ezzat H, Elsebae M. Botulinum toxin injection versus lateral internal sphincterotomy in the treatment of chronic anal fissure: a randomized controlled trial. *World J Surg* 2010;34:2730–2734. [PubMed]
- Suknaic S, Patrlj L, Steresinic M, et al. [Surgical or biologic sphincterotomy in the treatment of chronic anal fissure]. [Croatian]. *Acta Medica Croatica* 2008;2:62:73–80
- Sahakitrungruang C, Vivatvakin B, Chongsrisawat V, et al. (2011) Long-term outcome of botulinum toxin injection for the treatment of chronic anal fissure: a randomized controlled trial. *Asian Biomedicine* 2011;5:397–401.
- Valizadeh N, Jalaly NY, Hassanzadeh M, et al. Botulinum toxin injection versus lateral internal sphincterotomy for the treatment of chronic anal fissure: randomized prospective controlled trial. *Langenbecks Arch Surg* 2012;397:1093–1098. [PubMed]
- Ho KS, Ho YH. Randomized clinical trial comparing oral nifedipine with lateral anal sphincterotomy and tailored sphincterotomy in the treatment of chronic anal fissure. *Br J Surg* 2005;92:403–408. [PubMed]
- Katsinelos P, Papaziogas B, Koutelidakis I, et al. Topical 0.5% nifedipine vs. lateral internal sphincterotomy for the treatment of chronic anal fissure: long-term follow-up. *Int J Colorectal Dis* 2006;21:179–183. [PubMed]
- Suvarna R, Panchami, Guruprasad RD. Chemical sphincterotomy versus surgical sphincterotomy in the management of chronic fissure in ANO: a prospective, randomized trial. *J Clin Diagnostic Res* 2012;6:1018–1021.
- Fischer M, Thermann M, Trobisch M, et al. Treatment of primary chronic fissure-in-ano by anal dilation versus sphincterotomy. *Langenbecks Arch Chir* 1976;343:35–44. [In German] [PubMed]
- Jensen SL, Lund F, Nielsen OV, et al. Lateral subcutaneous sphincterotomy versus anal dilatation in the treatment of fissure in ano in outpatients: a prospective randomised study. *Br Med J* 1984;289:528–530. [PubMed]
- Marby M, Alexander-Williams J, Buchmann P, et al. A randomized controlled trial to compare anal dilatation with lateral subcutaneous sphincterotomy for anal fissure. *Dis Colon Rectum* 1979;22:308–311. [PubMed]
- Olsen J, Mortensen PE, Krogh P, et al. Anal sphincter function after treatment of fissure-in-ano by lateral subcutaneous sphincterotomy versus anal dilatation. A randomized study. *Int J Colorectal Dis* 1987;2:155–157. [PubMed]
- Ram E, Vishne T, Lerner I, et al. Anal dilatation versus left lateral sphincterotomy for chronic anal fissure: a prospective randomized study. *Tech Coloproctol* 2007 Dec 3 [epub ahead of print]. [PubMed]

37. Saad AM, Omer A. Surgical treatment of chronic fissure-in-ano: a prospective randomised study. *East Afr Med J* 1992;69:613–615.[\[PubMed\]](#)
38. Weaver RM, Ambrose NS, Alexander-Williams J, et al. Manual dilatation of the anus versus lateral subcutaneous sphincterotomy in the treatment of chronic fissure-in-ano. Results of a prospective, randomized, clinical trial. *Dis Colon Rectum* 1987;30:420–423.[\[PubMed\]](#)
39. Renzi A, Izzo D, Di Sarno G, et al. Clinical, manometric, and ultrasonographic results of pneumatic balloon dilatation vs. lateral internal sphincterotomy for chronic anal fissure: a prospective, randomized, controlled trial. *Diseases of the Colon & Rectum* 2008;1:51:121–127
40. Yucel T, Gonullu D, Oncu M, et al. Comparison of controlled-intermittent anal dilatation and lateral internal sphincterotomy in the treatment of chronic anal fissures: a prospective, randomized study. *Int J Surg* 2009;7:228–231.[\[PubMed\]](#)
41. Arroyo A, Pérez F, Serrano P, et al. Open versus closed lateral sphincterotomy performed as an outpatient procedure under local anesthesia for chronic anal fissure: prospective randomized study of clinical and manometric longterm results. *J Am Coll Surg* 2004;199:361–367.[\[PubMed\]](#)
42. Boulos PB, Araujo JG. Adequate internal sphincterotomy for chronic anal fissure: subcutaneous or open technique? *Br J Surg* 1984;71:360–362.[\[PubMed\]](#)
43. Filingeri V, Gravante G. A prospective randomized trial between subcutaneous lateral internal sphincterotomy with radiofrequency bistoury and conventional Parks' operation in the treatment of anal fissures. *Eur Rev Med Pharmacol Sci* 2005;9:175–178.[\[PubMed\]](#)
44. Kortbeek JB, Langevin JM, Khoo RE, et al. Chronic fissure-in-ano: a randomized study comparing open and subcutaneous lateral internal sphincterotomy. *Dis Colon Rectum* 1992;35:835–837.[\[PubMed\]](#)
45. Wiley M, Day P, Rieger N, et al. Open versus closed lateral internal sphincterotomy for idiopathic fissure-in-ano: a prospective, randomized, controlled trial. *Dis Colon Rectum* 2004;47:847–852.[\[PubMed\]](#)
46. Elsebae MM. A study of fecal incontinence in patients with chronic anal fissure: prospective, randomized, controlled trial of the extent of internal anal sphincter division during lateral sphincterotomy. *World J Surg* 2007;31:2052–2057.[\[PubMed\]](#)
47. Mentis BB, Ege B, Leventoglu S, et al. Extent of lateral internal sphincterotomy: up to the dentate line or up to the fissure apex? *Dis Colon Rectum* 2005; 48:365–370.[\[PubMed\]](#)
48. Mentis BB, Güner MK, Leventoglu S, et al. Fine-tuning of the extent of lateral internal sphincterotomy: spasm-controlled versus up to the fissure apex. *Dis Colon Rectum* 2008;51:128–133.[\[PubMed\]](#)
49. Leong AF, Seow-Choen F. Lateral sphincterotomy compared with anal advancement flap for chronic anal fissure. *Dis Colon Rectum* 1995;38:69–71.[\[PubMed\]](#)
50. Brown CJ, Dubreuil D, Santoro L, et al. Lateral internal sphincterotomy is superior to topical nitroglycerin for healing chronic anal fissure and does not compromise long-term fecal continence: six-year follow-up of a multicenter, randomized, controlled trial. *Dis Colon Rectum* 2007;50:442–448.[\[PubMed\]](#)
51. Mentis BB, Tezcaner T, Yilmaz U, et al. Results of lateral internal sphincterotomy for chronic anal fissure with particular reference to quality of life. *Dis Colon Rectum* 2006;49:1045–1051.[\[PubMed\]](#)
52. Hyman N. Incontinence after lateral internal sphincterotomy: a prospective study and quality of life assessment. *Dis Colon Rectum* 2004;47:35–38.[\[PubMed\]](#)

Richard L. Nelson
 Consultant Surgeon
 Department of General Surgery
 Northern General Hospital
 Sheffield
 UK

Competing interests: RLN has received fees from the American College of Physicians for Web-based education modules. He is also the author references cited in this review.

Disclaimer

The information contained in this publication is intended for medical professionals. Categories presented in Clinical Evidence indicate a judgement about the strength of the evidence available to our contributors prior to publication and the relevant importance of benefit and harms. We rely on our contributors to confirm the accuracy of the information presented and to adhere to describe accepted practices. Readers should be aware that professionals in the field may have different opinions. Because of this and regular advances in medical research we strongly recommend that readers' independently verify specified treatments and drugs including manufacturers' guidance. Also, the categories do not indicate whether a particular treatment is generally appropriate or whether it is suitable for a particular individual. Ultimately it is the readers' responsibility to make their own professional judgements, so to appropriately advise and treat their patients. To the fullest extent permitted by law, BMJ Publishing Group Limited and its editors are not responsible for any losses, injury or damage caused to any person or property (including under contract, by negligence, products liability or otherwise) whether they be direct or indirect, special, incidental or consequential, resulting from the application of the information in this publication.

GRADE Evaluation of interventions for Anal fissure (chronic).

Important outcomes	Fissure healing, persistence, or recurrence, Symptom improvement								GRADE	Comment
	Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size		
<i>What are the effects of surgical treatments for chronic anal fissure?</i>										
	1 (36) ^[11]	Fissure healing, persistence, or recurrence	Anal stretch/dilation versus nitric oxide donors (topical glyceryl trinitrate)	4	-2	0	-1	0	Very low	Quality points deducted for sparse data and unclear randomisation; directness point deducted for short follow-up
	9 (694) ^{[11] [20] [21]}	Fissure healing, persistence, or recurrence	Internal anal sphincterotomy versus nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate)	4	-1	0	0	+2	High	Quality point deducted for weak methods (unclear blinding); effect-size points added for OR >5
	1 (80) ^[20]	Symptom improvement	Internal anal sphincterotomy versus nitric oxide donors (topical glyceryl trinitrate, topical isosorbide dinitrate)	4	-2	0	0	0	Low	Quality points deducted for sparse data and significant between-group differences at baseline
	8 (535) ^{[11] [20] [27] [28]}	Fissure healing, persistence, or recurrence	Internal anal sphincterotomy versus botulinum A toxin-haemagglutinin complex	4	0	0	0	+2	High	Effect-size points added for OR >5
	2 (120) ^{[20] [27]}	Symptom improvement	Internal anal sphincterotomy versus botulinum A toxin-haemagglutinin complex	4	-3	0	0	0	Very low	Quality points deducted for weak methods (unclear blinding), sparse data, and incomplete reporting of results
	4 (468) ^{[11] [20] [31]}	Fissure healing, persistence, or recurrence	Internal anal sphincterotomy versus calcium channel blockers	4	-2	-1	0	+2	Low	Quality points deducted for weak methods, short follow up in 2 RCTs; consistency point deducted for heterogeneity; effect-size points added for OR >5
	1 (80) ^{[20] [31]}	Symptom improvement	Internal anal sphincterotomy versus calcium channel blockers	4	-2	0	0	0	Low	Quality points deducted for sparse data and significant between-group differences at baseline
	9 (582) ^[1]	Fissure healing, persistence, or recurrence	Internal anal sphincterotomy versus anal stretch/dilation	4	-1	-1	0	0	Low	Quality point deducted for weak methods of some included RCTs; consistency point deducted for statistical heterogeneity
	5 (336) ^[1]	Fissure healing, persistence, or recurrence	Open versus closed internal anal sphincterotomy	4	-2	0	0	0	Low	Quality points deducted for randomisation by pulling cards and unclear blinding
	3 (228) ^[1]	Fissure healing, persistence, or recurrence	Different lengths of internal anal sphincterotomy division versus each other	4	-3	0	-1	+2	Low	Quality points deducted for quasi-randomisation in 1 RCT and unclear allocation concealment and blinding in all 3 RCTs; directness point deducted for small number of events (1 event in 1 arm); effect-size points added for OR <0.2
	1 (40) ^[49]	Fissure healing, persistence, or recurrence	Internal anal sphincterotomy versus anal advancement flap	4	-1	0	-1	0	Low	Quality point deducted for sparse data; directness point deducted for small number of events (3 people in total not healed)

Important outcomes		Fissure healing, persistence, or recurrence, Symptom improvement							
Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
<p>We initially allocate 4 points to evidence from RCTs, and 2 points to evidence from observational studies. To attain the final GRADE score for a given comparison, points are deducted or added from this initial score based on preset criteria relating to the categories of quality, directness, consistency, and effect size. Quality: based on issues affecting methodological rigour (e.g., incomplete reporting of results, quasi-randomisation, sparse data [<200 people in the analysis]). Consistency: based on similarity of results across studies. Directness: based on generalisability of population or outcomes. Effect size: based on magnitude of effect as measured by statistics such as relative risk, odds ratio, or hazard ratio.</p>									