

Haemorrhoids: haemorrhoidal artery ligation

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ABSTRACT

INTRODUCTION: Haemorrhoids are cushions of submucosal vascular tissue located in the anal canal starting just proximal to the dentate line. Haemorrhoids are a common condition. The incidence is difficult to ascertain as many people with the condition will never consult a medical practitioner. **METHODS AND OUTCOMES:** We conducted a systematic overview, aiming to answer the following clinical question: What are the effects of haemorrhoidal artery ligation for haemorrhoidal disease? We searched: Medline, Embase, The Cochrane Library, and other important databases up to October 2014 (BMJ Clinical Evidence overviews are updated periodically; please check our website for the most up-to-date version of this overview). **RESULTS:** At this update, searching of electronic databases retrieved 150 studies. After deduplication and removal of conference abstracts, 70 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 46 studies and the further review of 24 full publications. Of the 24 full articles evaluated, one systematic review and seven RCTs were added at this update. We performed a GRADE evaluation for 11 PICO combinations. **CONCLUSIONS:** In this systematic overview, we categorised the efficacy for seven comparisons, based on information about the effectiveness and safety of haemorrhoidal artery ligation versus closed haemorrhoidectomy, injection sclerotherapy, infrared coagulation, open excisional (Milligan-Morgan) haemorrhoidectomy, radiofrequency ablation, rubber band ligation, and stapled haemorrhoidectomy.

QUESTIONS

What are the effects of haemorrhoidal artery ligation for haemorrhoidal disease? 4

INTERVENTIONS

HAEMORRHOIDAL DISEASE

Trade off between benefits and harms

Haemorrhoidal artery ligation versus closed haemorrhoidectomy **New** 4

Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy **New** 7

Haemorrhoidal artery ligation versus stapled haemorrhoidectomy **New** 12

Unknown effectiveness

Haemorrhoidal artery ligation versus injection sclerotherapy **New** 7

Haemorrhoidal artery ligation versus infrared coagulation **New** 7

Haemorrhoidal artery ligation versus radiofrequency ablation **New** 12

Haemorrhoidal artery ligation versus rubber band ligation **New** 12

Key points

- Haemorrhoids are cushions of submucosal vascular tissue located in the anal canal starting just proximal to the dentate line. Haemorrhoidal disease occurs when there are symptoms such as bleeding, prolapse, pain, thrombosis, mucus discharge, and pruritus.
Incidence is difficult to ascertain as many people with the condition will never consult a medical practitioner. One study reported a prevalence of 39%, with nearly half of those identified reporting haemorrhoidal symptoms.
- First- and second-degree haemorrhoids are classically treated with some form of non-surgical ablative/fixative intervention. Third-degree are treated with rubber band ligation or haemorrhoidectomy and fourth-degree with haemorrhoidectomy.
- Eventual choice of treatment will be based on a number of individual and operative factors.
- In [previous versions of this overview](#) we evaluated the evidence for a broad range of interventions for haemorrhoids, including closed haemorrhoidectomy, infrared coagulation/photocoagulation, injection sclerotherapy, open excisional (Milligan-Morgan) haemorrhoidectomy, radiofrequency ablation, rubber band ligation, and stapled haemorrhoidectomy. Haemorrhoidal artery ligation (HAL; also known as transanal haemorrhoidal de-arterialisation) has grown in popularity since the last overview. For this update we have, therefore, focused on the evidence for the effectiveness of HAL and how it compares to other selected surgical and non-surgical interventions for haemorrhoids. We evaluated evidence from RCTs and systematic reviews of RCTs.
- We found insufficient evidence to judge the effectiveness of [haemorrhoidal artery ligation](#) compared with [injection sclerotherapy](#), [infrared coagulation](#), [rubber band ligation](#), or [radiofrequency ablation](#).
- For haemorrhoidal artery ligation compared with [stapled haemorrhoidectomy](#), [closed haemorrhoidectomy](#), and [open excisional \(Milligan-Morgan\) haemorrhoidectomy](#), the RCT evidence showed that there was a balance between the benefits (e.g., symptom and quality of life improvement, shortened length of hospital stay) and harms (e.g., postoperative pain, overall complications) associated with each procedure.

Clinical context

GENERAL BACKGROUND

Haemorrhoids are common in the general population. For people needing treatment there are a range of options available, although eventual choice of treatment will be based on a number of individual and operative factors.

FOCUS OF THE REVIEW

In [previous versions of this overview](#) we evaluated the evidence for a broad range of interventions for haemorrhoids, including closed haemorrhoidectomy, infrared coagulation/photocoagulation, injection sclerotherapy, open excisional (Milligan-Morgan) haemorrhoidectomy, radiofrequency ablation, rubber band ligation, and stapled haemorrhoidectomy. Haemorrhoidal artery ligation (HAL; also known as [transanal haemorrhoidal de-arterialisation](#)) has grown in popularity since the last overview. For this update, we have, therefore, focused on the evidence for the effectiveness of HAL and how it compares to other selected surgical and non-surgical interventions for haemorrhoids.

COMMENTS ON EVIDENCE

We found no RCTs comparing HAL with injection sclerotherapy, infrared coagulation, rubber band ligation, or radiofrequency ablation. We found one systematic review and three subsequent RCTs comparing HAL with stapled haemorrhoidectomy; two RCTs comparing HAL with closed haemorrhoidectomy; and two RCTs of HAL versus open excisional (Milligan-Morgan) haemorrhoidectomy. Overall, the quality of the evidence ranged from moderate to very low.

SEARCH AND APPRAISAL SUMMARY

The update literature search for this overview was carried out from the date of the last search, May 2008, to October 2014. For more information on the electronic databases searched and criteria applied during assessment of studies for potential relevance to the overview, please see the Methods section. Searching of electronic databases retrieved 150 studies. After deduplication and removal of conference abstracts, 70 records were screened for inclusion in the overview. Appraisal of titles and abstracts led to the exclusion of 46 studies and the further review of 24 full publications. Of the 24 full articles evaluated, one systematic review and seven RCTs were added at this update. In addition, one systematic review published after the search date of this overview was added to the Comment section.

DEFINITION

Haemorrhoids are cushions of submucosal vascular tissue located in the anal canal starting just proximal to the dentate line. These vascular cushions are a normal anatomical structure of the anal canal, and their existence does not necessarily indicate haemorrhoidal disease. Haemorrhoidal disease occurs when there are symptoms such as bleeding, prolapse, pain, thrombosis, mucus discharge, and pruritus. Rectal bleeding is the most common manifestation of haemorrhoidal disease. The bleeding tends to be bright red in nature and is visible on the toilet tissue or drips into the toilet bowl. Haemorrhoids can occur internally, externally, or can be mixed (internal and external components). If prolapse occurs, a perianal mass may be evident with defecation. Haemorrhoids may be classified into internal haemorrhoids, originating from the internal haemorrhoidal plexus above the dentate line, and external haemorrhoids, originating from the external haemorrhoidal plexus below the dentate line. Internal haemorrhoids are traditionally graded into four degrees.^[1] **First degree (or grade I)** The haemorrhoids bleed with defecation but do not prolapse. First-degree haemorrhoids associated with mild symptoms are usually secondary to leakage of blood from mildly inflamed, thin-walled veins or arterioles. Conservative management with dietary manipulation (addition of fibre) and attention to anal hygiene is often adequate.^[2] Recurrent rectal bleeding may require ablation of the vessels with non-surgical ablative techniques, such as injection sclerotherapy, infrared coagulation, or rubber band ligation. Infrared coagulation is used infrequently in clinical practice in the UK today, whereas rubber band ligation and injection sclerotherapy are commonly used. **Second degree (grade II)** The haemorrhoids prolapse with defecation and reduce spontaneously. Second-degree haemorrhoids can be treated with rubber band ligation or other non-surgical ablative techniques. **Third degree (grade III)** The haemorrhoids prolapse and require manual reduction. In third-degree haemorrhoids, where there is significant destruction of the suspensory ligaments, relocation and fixation of the mucosa to the underlying muscular wall is generally necessary. Prolapse can be treated with rubber band ligation initially, but haemorrhoidectomy may be required, especially if prolapse is seen in more than one position.^[2] **Fourth degree (grade IV)** The haemorrhoids prolapse and cannot be reduced. If treatment is necessary, fourth-degree haemorrhoids require haemorrhoidectomy. Haemorrhoids are thought to be associated with chronic constipation, straining to defecate, pregnancy, and low dietary fibre. Frequency, duration, and severity of haemorrhoidal symptoms, such as bleeding, prolapse, or both, determine the type of treatment. Often, absent or episodic symptoms do not require treatment, and the presence of symptoms does not mandate invasive treatment. Some people decline treatment if they can be appropriately reassured that there is no other, more serious, reason for their symptoms.

Haemorrhoids: haemorrhoidal artery ligation

INCIDENCE/ PREVALENCE	Haemorrhoids are common in the general population. The incidence is difficult to ascertain, as many people with the condition will never consult a medical practitioner, but up to 10 million people in the US are reported to be affected. ^[2] One Austrian study of nearly 1000 patients undergoing bowel cancer screening colonoscopy reported haemorrhoids to be prevalent in 39% of patients. In 73% of these cases, the haemorrhoids were classified as grade I, 18% were classified as grade II, 8% as grade III, and 1% as grade IV. Of those diagnosed with haemorrhoids, only 45% reported haemorrhoidal symptoms. ^[3]
AETIOLOGY/ RISK FACTORS	The cause of haemorrhoids remains unknown, but a downward slide of the anal vascular cushions is considered the most likely explanation. ^[4] Other possible causes include straining to defecate, erect posture, and obstruction of venous return from raised intra-abdominal pressure (e.g., in pregnancy). It is thought that there may be a hereditary predisposition in some people, possibly due to a congenital weakness of the venous wall or suspensory haemorrhoidal ligaments. Diagnosis Accurate diagnosis requires a detailed history, thorough examination, and proctoscopic inspection of the anal canal and distal rectum. It is important to exclude other conditions such as colorectal cancer or inflammatory bowel disease in people who present with haemorrhoids. ^[2]
PROGNOSIS	The prognosis is generally excellent, as many symptomatic episodes will often settle with conservative measures only. If further intervention is required, the prognosis remains good, although symptoms may recur. Early in the clinical course of haemorrhoids, prolapse reduces spontaneously. Later, the prolapse may require manual reduction and might result in mucus discharge, which can cause pruritus ani. Pain is usually not a symptom of internal haemorrhoids, unless the haemorrhoids are prolapsed. Pain may be associated with thrombosed external haemorrhoids. Death from bleeding haemorrhoids is extremely rare.
AIMS OF INTERVENTION	To relieve symptoms (rectal bleeding, prolapse, pruritus ani, mucus discharge, pain); to reassure the patient that no other pathology is causing the symptoms; to minimise the adverse effects of treatment.
OUTCOMES	Symptom improvement (bleeding, recurrent prolapse, need for additional treatment post-procedure); length of hospital stay ; quality of life , including time to return to work and normal activities; adverse effects (overall complications, time to wound healing, bleeding, constipation, incontinence, infection, nausea and vomiting, pain, rectal tenesmus, stenosis, urinary retention, wound dehiscence).
METHODS	Search strategy <i>BMJ Clinical Evidence</i> search and appraisal date October 2014. Databases used to identify studies for this systematic overview include: Medline 1966 to October 2014, Embase 1980 to October 2014, The Cochrane Database of Systematic Reviews 2014, issue 10 (1966 to date of issue), the Database of Abstracts of Reviews of Effects (DARE), and the Health Technology Assessment (HTA) database. Inclusion criteria Study design criteria for inclusion in this systematic overview were published systematic reviews and RCTs published in English, including 'unblinded' or 'open' studies, and containing at least 20 individuals per treatment arm, of whom more than 80% were followed up. There was no minimum length of follow-up. We have considered only adults in this overview and have excluded pregnant women. <i>BMJ Clinical Evidence</i> does not necessarily report every study found (e.g., every systematic review). Rather, we report the most recent, relevant, and comprehensive studies identified through an agreed process involving our evidence team, editorial team, and expert contributors. Evidence evaluation A systematic literature search was conducted by our evidence team, who then assessed titles and abstracts, and finally selected articles for full text appraisal against inclusion and exclusion criteria agreed <i>a priori</i> with our expert contributors. In consultation with the expert contributors, studies were selected for inclusion and all data relevant to this overview extracted into the benefits and harms section of the overview. In addition, information that did not meet our pre-defined criteria for inclusion in the benefits and harms section may have been reported in the 'Further information on studies' or 'Comment' section. Adverse effects All serious adverse effects, or those adverse effects reported as statistically significant, were included in the harms section of the overview. Pre-specified adverse effects identified as being clinically important were also reported, even if the results were not statistically significant. Although <i>BMJ Clinical Evidence</i> presents data on selected adverse effects reported in included studies, it is not meant to be, and cannot be, a comprehensive list of all adverse effects, contraindications, or interactions of included drugs or interventions. A reliable national or local drug database must be consulted for this information. Comment and Clinical guide sections In the Comment section of each intervention, our expert contributors may have provided additional comment and analysis of the evidence, which may include additional studies (over and above those identified via our systematic search) by way of background data or supporting information. As <i>BMJ Clinical Evidence</i> does not systematically search for studies reported in the Comment section, we cannot guarantee the completeness of the studies listed there or the robustness of methods. Our expert contributors

Haemorrhoids: haemorrhoidal artery ligation

add clinical context and interpretation to the Clinical guide sections where appropriate. **Structural changes this update** At this update, we have focused on haemorrhoidal artery ligation. **Data and quality** To aid readability of the numerical data in our overviews, 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). *BMJ Clinical Evidence* does not report all methodological details of included studies. Rather, it reports by exception any methodological issue or more general issue that may affect the weight a reader may put on an individual study, or the generalisability of the result. These issues may be reflected in the overall GRADE analysis. We have performed a GRADE evaluation of the quality of evidence for interventions included in this review (see table, p 21). 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 haemorrhoidal artery ligation for haemorrhoidal disease?

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS CLOSED HAEMORRHOIDECTOMY New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, see table, p 21 .
- We don't know how haemorrhoidal artery ligation (HAL) and closed haemorrhoidectomy compare at increasing symptom resolution at 1 year in people with mainly second- to fourth-degree haemorrhoids, as we only found one small RCT which found no difference.
- We don't know how HAL plus mucopexy and closed haemorrhoidectomy compare at improving quality of life at 3 months in people with symptomatic third-degree or non-incarcerated fourth-degree internal haemorrhoids. We only found one small RCT reporting no absolute results and with no assessment of significance of the results.
- HAL may be more effective than closed haemorrhoidectomy at reducing postoperative pain and mean hospital stay in people with mainly second- to fourth-degree haemorrhoids, based on the results of two small RCTs.

Benefits and harms

Haemorrhoidal artery ligation versus closed haemorrhoidectomy:

We found no systematic review, but found two RCTs. ^[5] ^[6]

Symptom improvement

HAL compared with closed haemorrhoidectomy We don't know how HAL and closed haemorrhoidectomy compare at increasing the proportion of people with resolution of symptoms at 1 year in people with mainly second- to fourth-degree haemorrhoids, as we found insufficient evidence from one small RCT (*low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Symptom improvement					
^[5] RCT	60 people; 1 with first-, 13 with second-, 19 with third-, and 27 with fourth-degree haemorrhoids	Resolution of haemorrhoidal symptoms , 1 year 25/30 (83%) with HAL 26/30 (87%) with closed haemorrhoidectomy	Reported as not significant P value not reported	↔	Not significant

No data from the following reference on this outcome. ^[6]

Length of hospital stay

HAL compared with closed haemorrhoidectomy HAL seems more effective than closed haemorrhoidectomy at reducing mean hospital stay in people with mainly second- to fourth-degree haemorrhoids (*moderate-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Length of hospital stay					
[5] RCT	60 people; 1 with first-, 13 with second-, 19 with third-, and 27 with fourth-degree haemorrhoids	Mean hospital stay 19.8 hours with HAL 62.9 hours with closed haemorrhoidectomy	P <0.0001	○○○	HAL

No data from the following reference on this outcome. [6]

Quality of life

HAL compared with closed haemorrhoidectomy We don't know how HAL plus mucopexy and closed haemorrhoidectomy compare at improving quality of life at 3 months in people with symptomatic third-degree or non-incarcerated fourth-degree internal haemorrhoids (*very low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Wellbeing and quality of life scores					
[6] RCT	40 people with symptomatic third-degree or non-incarcerated chronic fourth-degree internal haemorrhoids	Disability and Quality of Life assessed using Short Form Health Survey (SF-12) for patient health and the Fecal Incontinence Quality of Life Score (FIQOL) , 3 months with HAL plus mucopexy with closed haemorrhoidectomy (Ferguson procedure) Absolute results not reported Reported that symptomatic relief was the same in both groups for SF-12 and FIQOL	Significance not assessed		

No data from the following reference on this outcome. [5]

Adverse effects

HAL compared with closed haemorrhoidectomy HAL plus mucopexy may be more effective than closed haemorrhoidectomy at reducing post-procedure anal pain and pain on defecation in people with mainly second- to fourth-degree haemorrhoids. However, we don't know how the treatments compare at reducing other post-procedure complications (*low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Post-procedure complications (any)					
[5] RCT	60 people; 1 with first-, 13 with second-, 19 with third-, and 27 with fourth-degree haemorrhoids	Complications 2 with HAL 14 with closed haemorrhoidectomy In the closed haemorrhoidectomy group, 9/30 people developed fever in the early postoperative period, 6 developed nausea, and 1 developed acute retention of urine In the HAL group, 2 people developed nausea	P <0.05	○○○	HAL

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[6] RCT	40 people with symptomatic third-degree or non-in-carcated chronic fourth-degree internal haemorrhoids	Proportion of people with constipation requiring laxative use or emergency department visit 2/20 (10%) with HAL plus mucopexy 4/20 (20%) with closed haemorrhoidectomy (Ferguson procedure)	P = 0.175	↔	Not significant
[6] RCT	40 people with symptomatic third-degree or non-in-carcated chronic fourth-degree internal haemorrhoids	Proportion of people with postoperative dysuria 1/20 (5%) with HAL plus mucopexy 1/20 (5%) with closed haemorrhoidectomy (Ferguson procedure)	Reported as not significant P value not reported	↔	Not significant
[6] RCT	40 people with symptomatic third-degree or non-in-carcated chronic fourth-degree internal haemorrhoids	Proportion of people reporting faecal incontinence 1/20 (5%) with HAL plus mucopexy 1/20 (5%) with closed haemorrhoidectomy (Ferguson procedure)	Reported as not significant P value not reported	↔	Not significant
Post-procedure pain					
[6] RCT	40 people with symptomatic third-degree or non-in-carcated chronic fourth-degree internal haemorrhoids	Proportion of people reporting postoperative anal pain 2/20 (10%) with HAL plus mucopexy 11/20 (55%) with closed haemorrhoidectomy (Ferguson procedure)	P = 0.001	○○○	HAL plus mucopexy
[6] RCT	40 people with symptomatic third-degree or non-in-carcated chronic fourth-degree internal haemorrhoids	Proportion of people reporting pain at the first postoperative bowel movement 11/20 (55%) with HAL plus mucopexy 19/20 (95%) with closed haemorrhoidectomy (Ferguson procedure)	P = 0.011	○○○	HAL plus mucopexy

Further information on studies

[5] This RCT was small. Comparisons need to be made with other treatment modalities before meaningful conclusions can be drawn.

Comment:

We identified one systematic review and network meta-analysis on surgical treatments for haemorrhoids published after the search date of this overview. [7] It found one RCT of HAL compared with closed haemorrhoidectomy, which is already included in the benefits and harms section above. [6] From the network meta-analysis, including indirect comparisons, the authors concluded that open and closed haemorrhoidectomies resulted in more postoperative complications and slower recovery, but fewer haemorrhoid recurrences, while HAL and stapled haemorrhoidectomies were associated with decreased postoperative pain and faster recovery, but higher recurrence rates. [7]

Haemorrhoids: haemorrhoidal artery ligation

Clinical guide

Most clinicians will recommend haemorrhoidectomy in cases where the haemorrhoids have no internal but large external components.

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS INJECTION SCLEROTHERAPY New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- We found no direct information from RCTs about how [haemorrhoidal artery ligation](#) (HAL) compares with [injection sclerotherapy](#) in the treatment of people with haemorrhoidal disease.

Benefits and harms

Haemorrhoidal artery ligation versus injection sclerotherapy:

We found no systematic review or RCTs.

Comment:

Clinical guide

Because there is a significant symptomatic price to pay for haemorrhoid surgery in terms of post-operative pain and wound healing, grade I and II haemorrhoids are usually treated with [injection sclerotherapy](#) or [rubber band ligation](#), whereas HAL tends to be reserved for patients with grade III or IV haemorrhoids. Therefore, there are no studies directly comparing HAL with injection sclerotherapy.

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS INFRARED COAGULATION New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- We found no direct information from RCTs about how [haemorrhoidal artery ligation](#) (HAL) compares with [infrared coagulation](#) in the treatment of people with haemorrhoidal disease.

Benefits and harms

Haemorrhoidal artery ligation versus infrared coagulation:

We found no systematic review or RCTs.

Comment:

Clinical guide

Because there is a significant symptomatic price to pay for haemorrhoid surgery in terms of post-operative pain and wound healing, grade I and II haemorrhoids are usually treated with [injection sclerotherapy](#), [rubber band ligation](#), or rarely [infrared coagulation](#), whereas HAL tends to be reserved for patients with grade III or IV haemorrhoids. Therefore, there are no studies directly comparing HAL with infrared coagulation.

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS OPEN EXCISIONAL (MILLIGAN-MORGAN) HAEMORRHOIDECTOMY New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- We don't know how [haemorrhoidal artery ligation](#) (HAL) and [open excisional haemorrhoidectomy](#) compare at improving symptoms (reduction in bleeding and need for further treatment post-surgery) or at improving quality of life scores in people with second- or third-degree haemorrhoids.
- HAL and open excisional haemorrhoidectomy may have similar complication rates, although one small study showed HAL to cause less postoperative pain.

Benefits and harms

Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy:

We found two RCTs. ^[8] ^[9]

Symptom improvement

HAL compared with open excisional haemorrhoidectomy We don't know how HAL and open excisional haemorrhoidectomy compare at reducing bleeding or need for further treatment post surgery at up to 2 years in people with second- or third-degree haemorrhoids, as we found insufficient evidence from two small RCTs (*low-quality evidence*).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Bleeding					
^[9] RCT	50 people with third-degree haemorrhoids	Proportion of people reporting bleeding , last month of 2-year follow-up 1/24 (4%) with HAL plus mucopexy 3/23 (13%) with open excisional haemorrhoidectomy	P = 0.33	↔	Not significant
^[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people reporting bleeding , 2–4 months 2/20 (10%) with HAL plus anopexy 0/18 (0%) with open excisional haemorrhoidectomy	Significance not assessed		
^[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people reporting bleeding , 1 year 3/20 (15%) with HAL plus anopexy 0/18 (0%) with open excisional haemorrhoidectomy	Significance not assessed		
Need for additional treatment post procedure					
^[9] RCT	50 people with third-degree haemorrhoids	Proportion of people needing ambulatory therapy for recurrence , over 2 years 2/24 (8%) with HAL plus mucopexy 0/23 (0%) with open excisional haemorrhoidectomy	P = 0.16	↔	Not significant
^[9] RCT	50 people with third-degree haemorrhoids	Proportion of people needing surgical therapy , over 2 years 1/24 (4%) with HAL plus mucopexy 1/23 (4%) with open excisional haemorrhoidectomy	P = 0.55	↔	Not significant
^[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people requiring further surgery , 2–4 months 2/20 (10%) with HAL plus anopexy 2/18 (11%) with open excisional haemorrhoidectomy	Significance not assessed		
^[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people requiring further surgery , 1 year 2/20 (10%) with HAL plus anopexy	Significance not assessed		

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		1/18 (6%) with open excisional haemorrhoidectomy			
[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people with need for manual repositioning , 2–4 months 0/20 (0%) with HAL plus anopexy 1/18 (6%) with open excisional haemorrhoidectomy	Significance not assessed		
[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people with need for manual repositioning , 1 year 4/20 (20%) with HAL plus anopexy 1/18 (6%) with open excisional haemorrhoidectomy	Significance not assessed		

Length of hospital stay

No data from the following reference on this outcome. [8] [9]

Quality of life

HAL compared with open excisional haemorrhoidectomy We don't know how HAL and open excisional haemorrhoidectomy compare at improving the time taken to return to normal activity or quality of life scores in people with second- or third-degree haemorrhoids, as we found insufficient evidence from two small RCTs ([very low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Return to normal activities					
[9] RCT	50 people with third-degree haemorrhoids	Median number of days to return to work or normal activity 10 days with HAL plus mucopexy 22 days with open excisional haemorrhoidectomy	P = 0.09	↔	Not significant
[8] RCT	40 people with second- or third-degree haemorrhoids	Median number of days to return to work 12 days with HAL plus anopexy 14 days with open excisional haemorrhoidectomy	Reported as not significant P value not reported	↔	Not significant
Wellbeing					
[8] RCT	40 people with second- or third-degree haemorrhoids	Median number of days during which wellbeing was reported as normal , first 14 postoperative days 8 days with HAL plus anopexy 3 days with open excisional haemorrhoidectomy Outcome was assessed by patients' response to a single question on whether wellbeing was "normal or worse than normal"	P = 0.045	○○○	HAL

Haemorrhoids: haemorrhoidal artery ligation

Adverse effects

HAL compared with open excisional haemorrhoidectomy HAL and open excisional haemorrhoidectomy may have similar complication rates, although, based on very limited evidence, HAL may cause less postoperative pain (very low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Post-procedure complications (any)					
[8] RCT	40 people with second- or third-degree haemorrhoids	Proportion of people reporting postoperative urinary retention , first 30 days 4/20 (20%) with HAL plus anopexy 3/18 (17%) with open excisional haemorrhoidectomy	Reported as not significant P value not reported	↔	Not significant
[8] RCT	40 people with second- or third-degree haemorrhoids	Number of people with postoperative complications , first 30 days 9/20 (45%) with HAL plus anopexy 5/18 (28%) with open excisional haemorrhoidectomy Complications were urinary retention, thrombosed haemorrhoid, severe pain requiring release of sutures, partial re-prolapse, and bleeding	Significance not assessed		
[8] RCT	40 people with second- or third-degree haemorrhoids	Number of postoperative complications , at follow-up, 2–4 months, and 1 year 1/20 (5%) with haemorrhoidal artery ligation plus anopexy 4/18 (22%) with open excisional haemorrhoidectomy No late complications were noted in either group	Significance not assessed		
Post-procedure pain					
[9] RCT	50 people with third-degree haemorrhoids	Pain (measured by visual analogue scale [VAS] 0 = no pain to 10 = worst pain): mean pain , day 1 5.5 with HAL plus mucopexy 7.0 with open excisional haemorrhoidectomy	P = 0.67	↔	Not significant
[9] RCT	50 people with third-degree haemorrhoids	Pain (measured by VAS 0 = no pain to 10 = worst pain): mean pain , 7 days 2.5 with HAL plus mucopexy 3.0 with open excisional haemorrhoidectomy	P = 0.71	↔	Not significant
[9] RCT	50 people with third-degree haemorrhoids	Pain (measured by VAS 0 = no pain to 10 = worst pain): mean pain , 14 days 0 with HAL plus mucopexy 1 with open excisional haemorrhoidectomy	P = 0.71	↔	Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[9] RCT	50 people with third-degree haemorrhoids	Pain during defecation (measured by VAS 0 = no pain to 10 = worst pain): mean pain , 7 days 3 with HAL plus mucopexy 5 with open excisional haemorrhoidectomy	P = 0.07	↔	Not significant
[9] RCT	50 people with third-degree haemorrhoids	Pain during defecation (measured by VAS 0 = no pain to 10 = worst pain): mean pain , 14 days 1 with HAL plus mucopexy 2 with open excisional haemorrhoidectomy	P = 0.51	↔	Not significant
[8] RCT	40 people with second- or third-degree haemorrhoids	Peak pain scores , first postoperative week with HAL plus anopexy with open excisional haemorrhoidectomy Absolute results reported graphically Reported as being significantly lower in people receiving HAL for 5 days in the first week compared with those given haemorrhoidectomy	P <0.05	○○○	HAL
[8] RCT	40 people with second- or third-degree haemorrhoids	Peak pain scores , over 14 postoperative days with HAL plus anopexy with open excisional haemorrhoidectomy Absolute results reported graphically	Reported as not significant P value not reported	↔	Not significant

Further information on studies

[9] The RCT was open label in design.

[8] The RCT was open label in design.

Comment:

We identified one systematic review and network meta-analysis on surgical treatments for haemorrhoids published after the search date of this overview. [7] It found one RCT of HAL compared with closed haemorrhoidectomy that met inclusion criteria for this *BMJ Clinical Evidence* overview. [9] This RCT is already reported in the benefits and harms section above. From the network meta-analysis, including indirect comparisons, the authors concluded that open and closed haemorrhoidectomies resulted in more postoperative complications and slower recovery, but fewer haemorrhoid recurrences, while HAL and stapled haemorrhoidectomies were associated with decreased postoperative pain and faster recovery, but higher recurrence rates. [7]

Clinical guide

Most clinicians will recommend haemorrhoidectomy in cases where the haemorrhoids have no internal but large external components.

Haemorrhoids: haemorrhoidal artery ligation

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS RADIOFREQUENCY ABLATION New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- We found no direct information from RCTs about how [haemorrhoidal artery ligation](#) (HAL) compares with [radiofrequency ablation](#) in the treatment of people with haemorrhoidal disease.

Benefits and harms

Haemorrhoidal artery ligation versus radiofrequency ablation:

We found no systematic review or RCTs.

Comment: A recent systematic review and network meta-analysis on surgical treatments for haemorrhoids has been published after the search date of this overview.^[7] It found no RCTs of HAL compared with radiofrequency ablation.

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS RUBBER BAND LIGATION New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- We found no direct information from RCTs about how [haemorrhoidal artery ligation](#) (HAL) compares with [rubber band ligation](#) in the treatment of people with haemorrhoidal disease.

Benefits and harms

Haemorrhoidal artery ligation versus rubber band ligation:

We found no systematic review or RCTs.

Comment: **Clinical guide**
Because there is a significant symptomatic price to pay for haemorrhoid surgery in terms of post-operative pain and wound healing, grade I and II haemorrhoids are usually treated with [injection sclerotherapy](#) or rubber band ligation, whereas HAL tends to be reserved for patients with grade III or IV haemorrhoids. Therefore, there are no studies directly comparing HAL with rubber band ligation.

OPTION HAEMORRHOIDAL ARTERY LIGATION VERSUS STAPLED HAEMORRHOIDECTOMY New

- For GRADE evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation, [see table, p 21](#) .
- [Haemorrhoidal artery ligation](#) (HAL) with or without [mucopexy](#) and [stapled haemorrhoidectomy](#) may not differ significantly in effectiveness at improving symptoms (reduction in the proportion of people with rectal bleeding, recurrence of haemorrhoids, and the need for further treatment).
- We don't know how HAL and stapled haemorrhoidectomy compare at reducing time to return to normal or to work activities in people with symptomatic third- and fourth-degree haemorrhoids requiring surgery.
- HAL may be more effective than stapled haemorrhoidectomy at marginally reducing mean hospital stay in people with symptomatic third-degree haemorrhoids, but evidence was weak and limited to one small RCT, and the observed difference in hospital stay may have been due to the different rates of local anaesthetic administration.
- We don't know how HAL and stapled haemorrhoidectomy compare in terms of associated adverse effects. We are aware of one further systematic review, published after our search date, that found significantly less postoperative bleeding with HAL compared with stapled haemorrhoidectomy.

Benefits and harms

Haemorrhoidal artery ligation versus stapled haemorrhoidectomy:

We found one systematic review (search date 2011) that identified three RCTs (150 people) comparing HAL with stapled haemorrhoidectomy (see Further information on studies).^[10] We also identified three subsequent RCTs.^[11]^[12]^[13]

Symptom improvement

HAL compared with stapled haemorrhoidectomy HAL with or without mucopexy and stapled haemorrhoidectomy may not differ significantly at reducing the proportion of people with rectal bleeding, recurrence of haemorrhoids in the short and longer term, and the need for further treatment (low-quality evidence).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Bleeding					
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with rectal bleeding , median follow-up of 42 months 19/63 (30%) with HAL plus mucopexy 14/61 (23%) with stapled haemorrhoidectomy	P = 0.481	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with rectal bleeding , 1 week 0/59 (0%) with HAL 2/63 (3%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
Recurrence					
[10] Systematic review	People with haemorrhoids of any grade 3 RCTs in this analysis See Further information on studies	Recurrence of haemorrhoids , unclear timeframe 14/80 (18%) with HAL 9/70 (13%) with stapled haemorrhoidectomy	RR 1.33 95% CI 0.62 to 2.84 P = 0.46	↔	Not significant
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Proportion of people with persistent or recurrent haemorrhoids , mean follow-up of 17 months 12/85 (14%) with HAL 6/84 (7%) with stapled haemorrhoidectomy	P = 0.22	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with recurrent prolapse , median follow-up of 42 months 16/63 (25%) with HAL plus mucopexy 5/61 (8%) with stapled haemorrhoidectomy Recurrence assessed by self-report at telephone interview, which can be unreliable	P = 0.021	○○○	stapled haemorrhoidectomy

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Need for additional treatment post procedure					
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Proportion of people requiring further treatment for haemorrhoids , mean follow-up of 17 months 10/85 (12%) with HAL 6/84 (7%) with stapled haemorrhoidectomy	P = 0.44	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people requiring repeat operation , median follow-up of 42 months 6/63 (10%) with HAL plus mucopexy 2/61 (3%) with stapled haemorrhoidectomy	P = 0.294	↔	Not significant

Length of hospital stay

HAL compared with stapled haemorrhoidectomy HAL may be more effective than stapled haemorrhoidectomy at reducing hospital stay in people with symptomatic third-degree haemorrhoids. However, evidence was weak, and follow-up treatments were different between groups ([very low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Length of hospital stay					
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Mean hospital stay (days) 1.14 with HAL 1.36 with stapled haemorrhoidectomy Significantly more people in the HAL group (13/85 [15%]) were given local or pudendal anaesthesia compared with those in the stapled haemorrhoidectomy group (6/84 [7%], P = 0.0015)	P = 0.03	○○○	HAL

No data from the following reference on this outcome. [\[10\]](#) [\[12\]](#) [\[13\]](#)

Quality of life

HAL compared with stapled haemorrhoidectomy We don't know how HAL and stapled haemorrhoidectomy compare at reducing time to return to normal or to work activities in people with symptomatic third- and fourth-degree haemorrhoids requiring surgery. One small RCT reported a similar number of days off work with each intervention but the significance of the result for this comparison was not assessed ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Return to normal activities					
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Median number of days to return to normal activities 14 days with HAL plus mucopexy 12 days with stapled haemorrhoidectomy	P = 0.273	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree	Median number of days to return to work activities 3.5 days with HAL	Significance not assessed		

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
	haemorrhoids requiring surgery	5.5 days with stapled haemorrhoidectomy 122 people in this analysis HAL is described in this RCT as transanal haemorrhoidal de-arterialisation			

Adverse effects

HAL compared with stapled haemorrhoidectomy We don't know how HAL and stapled haemorrhoidectomy compare in terms of associated adverse effects in people undergoing surgery for haemorrhoids ([low-quality evidence](#)).

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
Post-procedure complications (any)					
[10] Systematic review	People with haemorrhoids of any grade 3 RCTs in this analysis See Further information on studies	Postoperative complications 6/80 (8%) with HAL 11/70 (16%) with stapled haemorrhoidectomy The review did not specify the postoperative complications reported in the RCTs	RR 0.48 95% CI 0.20 to 1.18 P = 0.11	↔	Not significant
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Proportion of people with any complication, within 30 postoperative days 26/85 (31%) with HAL 27/84 (32%) with stapled haemorrhoidectomy Complications included urinary retention, dysuria, bleeding, thrombosis, and haematoma	Reported as not significant P value not reported	↔	Not significant
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Number of people with any late postoperative complication, mean follow-up of 17 months 0/85 (0%) with HAL 6/84 (7%) with stapled haemorrhoidectomy Complications included abscess, faecal urgency, pain, and obstructed defecation	P = 0.028	○○○	HAL
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative rectal bleeding 1/63 (2%) with HAL plus mucopexy 1/61 (2%) with stapled haemorrhoidectomy	P = 0.490	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative urinary retention 5/63 (8%) with HAL plus mucopexy 8/61 (13%) with stapled haemorrhoidectomy	P = 0.517	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative dysuria 3/63 (5%) with HAL plus mucopexy	P = 0.964	↔	Not significant

Haemorrhoids: haemorrhoidal artery ligation

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		4/61 (7%) with stapled haemorrhoidectomy			
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative faecal urgency 3/63 (5%) with HAL plus mucopexy 2/61 (3%) with stapled haemorrhoidectomy	P = 0.975	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative haematoma 4/63 (6%) with HAL plus mucopexy 2/61 (3%) with stapled haemorrhoidectomy	P = 0.463	↔	Not significant
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Faecal obstruction (measured with obstructed defecation score [ODS]), 18 months 2.60 with HAL 3.57 with stapled haemorrhoidectomy	P <0.02	○○○	HAL
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Faecal incontinence (measured using Wexner score), mean follow-up of 17 months with HAL with stapled haemorrhoidectomy Absolute results reported graphically	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative haemorrhage, 1 day 0/59 (0%) with HAL 5/63 (8%) with stapled haemorrhoidectomy See Further information on studies HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with external acute urinary retention, 1 day 5/59 (8%) with HAL 3/63 (5%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with tenesmus, 3 months 1/55 (2%) with HAL 3/57 (5%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with constipation , 3 months 2/55 (4%) with HAL 1/63 (2%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
Post-procedure pain					
[10] Systematic review	People with haemorrhoids of any grade 3 RCTs in this analysis See Further information on studies	Pain (measured by visual analogue scale [VAS]) with HAL with stapled haemorrhoidectomy Absolute results not reported 150 people in this analysis	Mean Difference -2.00 95% CI -2.06 to -1.94 P <0.00001	○○○○	HAL
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Mean pain score, spontaneous (VAS of 0–99 mm) , first postoperative week 20.2 with HAL 24.1 with stapled haemorrhoidectomy	P = 0.25	↔	Not significant
[11] RCT	169 people with symptomatic third-degree haemorrhoids	Mean pain score, on defecation (measured by VAS of 0–99 mm) , first postoperative week 27.0 with HAL 33.1 with stapled haemorrhoidectomy	P = 0.33	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Median pain score (measured by VAS 0 = no pain to 10 = worst pain imaginable) , 24 hours 4 with HAL plus mucopexy 3 with stapled haemorrhoidectomy	P = 0.234	↔	Not significant
[12] RCT	137 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative anal pain 8/63 (13%) with HAL plus mucopexy 4/61 (7%) with stapled haemorrhoidectomy	P = 0.161	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative pain score >5 (measured by VAS) , 1 day 4/59 (7%) with HAL 10/63 (16%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative pain at rest (measured by VAS) , 1 month 1/59 (2%) with HAL	Reported as not significant P value not reported	↔	Not significant

Haemorrhoids: haemorrhoidal artery ligation

Ref (type)	Population	Outcome, Interventions	Results and statistical analysis	Effect size	Favours
		6/63 (10%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation			
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with early postoperative pain at rest (measured by VAS) , 3 months 0/55 (0%) with HAL 3/57 (5%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with postoperative pain after evacuation (measured by VAS) , 1 month 4/59 (7%) with HAL 7/63 (11%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant
[13] RCT	122 people with symptomatic third- and fourth-degree haemorrhoids requiring surgery	Proportion of people with postoperative pain after evacuation (measured by VAS) , 3 months 0/55 (0%) with HAL 5/57 (9%) with stapled haemorrhoidectomy HAL is described in this RCT as transanal haemorrhoidal de-arterialisation	Reported as not significant P value not reported	↔	Not significant

Further information on studies

[10] The review included RCTs evaluating treatment of any grade of haemorrhoids. The review included two RCTs on HAL plus mucopexy and one RCT (57 patients, published in abstract form only) that seems to have been with no mucopexy performed. As there was no heterogeneity in any of the meta-analyses ($I^2 = 0\%$ for all), we have reported the relevant results in the table above. The review also reported on operative times and found no significant difference between HAL and stapled haemorrhoidectomy (2 RCTs, 105 patients, mean difference -2.20, 95% CI -9.36 to +4.97, $P = 0.55$).

[11] The RCT was open label in design.

[13] The open-label RCT randomly divided patients into two groups. Details on randomisation method are not available. The authors of the RCT stated that people experiencing haemorrhage after stapled haemorrhoidectomy stayed in hospital for an additional 3 days compared with people who did not have a rectal haemorrhage in the same group.

Comment: We identified one systematic review and network meta-analysis on surgical treatments for haemorrhoids published after the search date of this overview. [7] The systematic review reported that there was significantly less postoperative bleeding with HAL compared with stapled haemorrhoidectomy.

Haemorrhoids: haemorrhoidal artery ligation

tomy (OR 0.27, 95% CI 0.09 to 0.75).^[7] There was no significant difference in other outcomes, including postoperative pain, time to return to work, and recurrence of symptoms or of haemorrhoids.

Clinical guide

When taking into account all studies identified in this overview and the meta-analysis published after our search date, there appears to be no significant difference between HAL and stapled haemorrhoidectomy in all outcomes apart from early postoperative haemorrhage rates, which were higher after stapled haemorrhoidectomy. Some authors have reported the rare occurrence of serious complications with stapled haemorrhoidectomy, such as pelvic sepsis. In practice, the choice between the two techniques is determined by the patient's and the clinician's treatment and risk priorities.

GLOSSARY

Closed haemorrhoidectomy An operative technique (an example of which is the Ferguson haemorrhoidectomy) whereby the haemorrhoid is excised (generally using scissors or diathermy) and the resulting defect is closed using sutures.

Infrared coagulation/photocoagulation An outpatient procedure that uses infrared energy to produce an area of submucosal fibrosis, leading to mucosal fixation and a reduction in the tendency to prolapse.

Injection sclerotherapy An outpatient procedure that allows oily phenol to be injected into the submucosa of the rectum, around the pedicles of the haemorrhoids. The oily phenol acts as an irritant, which induces a fibrotic reaction and obliteration of the haemorrhoidal vessels and resultant atrophy of the haemorrhoids.

Radiofrequency ablation A technique that ablates tissue by converting radiofrequency waves into heat.

Rubber band ligation An outpatient procedure that allows between one and three rubber bands to be applied to the rectal mucosa above the haemorrhoid(s), leading to mucosal fixity and a reduction in the tendency to prolapse.

Anopexy An augmentation of haemorrhoidal artery ligation, in which a series of running mucosal sutures gather up the redundant haemorrhoids to achieve reduction of the mucosal prolapse. Also termed a 'mucopexy'.

Haemorrhoidal artery ligation (HAL) Selective ligation of the arteries supplying blood to the haemorrhoids using a specially designed anoscope with a Doppler guided facility to identify the appropriate vessels.

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.

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

Mucopexy An augmentation of haemorrhoidal artery ligation, in which a series of running mucosal sutures gather up the redundant haemorrhoids to achieve reduction of the mucosal prolapse. Also termed an 'anopexy'.

Open excisional (Milligan-Morgan) haemorrhoidectomy An operative technique whereby the haemorrhoid is excised (generally using scissors or diathermy) and the resulting defect is left open to heal by secondary intention.

Proctoscopy In the UK, 'proctoscopy' refers to examination of the anal canal and distal rectum. In North America, the term 'anoscopy' is used.

Short Form (SF-12) A generic, multi-purpose short-form survey with 12 questions selected from the SF-36 Health Survey. The responses, when combined, scored, and weighted, result in two scales of mental and physical functioning and overall health-related quality of life.

Stapled haemorrhoidectomy An operative technique that uses a circular stapling device inserted into the rectum through the anal canal to facilitate pulling up of the prolapsed haemorrhoidal tissue, removal of redundant rectal mucosa, and stapling off the terminal branches of the superior haemorrhoidal artery. The technique may be more accurately termed 'stapled haemorrhoidopexy', as the haemorrhoids themselves are not actually excised but relocated within the anal canal.

Transanal haemorrhoidal de-arterialisation (THD) An operation where a specially designed proctoscope with a built-in doppler ultrasound probe is used to identify the haemorrhoidal arteries in at least six locations around the anal clock face and place figure-of-eight sutures around these arteries above the dentate line, thus reducing arterial inflow into the haemorrhoids plexus. The operation may be augmented by a series of running mucosal sutures below the figure-of-eight stitch, which gather up the redundant haemorrhoids to achieve reduction of the mucosal prolapse. This is termed a 'mucopexy' or 'anopexy'.

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

SUBSTANTIVE CHANGES

Haemorrhoidal artery ligation versus closed haemorrhoidectomy New option. Two RCTs added.^[5] ^[6] Categorised as 'trade-off between benefits and harms'.

Haemorrhoidal artery ligation versus injection sclerotherapy New option. No systematic reviews or RCTs added. Categorised as 'unknown effectiveness'.

Haemorrhoidal artery ligation versus infrared coagulation New option. No systematic reviews or RCTs added. Categorised as 'unknown effectiveness'.

Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy New option. Two RCTs added. ^[8] ^[9] Categorised as 'trade-off between benefits and harms'.

Haemorrhoidal artery ligation versus radiofrequency ablation New option. No systematic reviews or RCTs added. Categorised as 'unknown effectiveness'.

Haemorrhoidal artery ligation versus rubber band ligation New option. No systematic reviews or RCTs added. Categorised as 'unknown effectiveness'.

Haemorrhoidal artery ligation versus stapled haemorrhoidectomy New option. One systematic review ^[10] and three RCTs ^[11] ^[12] ^[13] added. Categorised as 'trade-off between benefits and harms'.

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GRADE Evaluation of interventions for Haemorrhoids: haemorrhoidal artery ligation.

Important outcomes	Adverse effects, Length of hospital stay, Quality of life, Symptom improvement									
	Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
<i>What are the effects of haemorrhoidal artery ligation for haemorrhoidal disease?</i>										
	1 (60) ^[5]	Symptom improvement	Haemorrhoidal artery ligation versus closed haemorrhoidectomy	4	-2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
	1 (60) ^[5]	Length of hospital stay	Haemorrhoidal artery ligation versus closed haemorrhoidectomy	4	-1	0	0	0	Moderate	Quality point deducted for sparse data
	1 (40) ^[6]	Quality of life	Haemorrhoidal artery ligation versus closed haemorrhoidectomy	4	-3	0	0	0	Very low	Quality points deducted for sparse data, methodological limitations (lack of statistical analysis of between-group difference), and incomplete reporting of results
	2 (100) ^{[5] [6]}	Adverse effects	Haemorrhoidal artery ligation versus closed haemorrhoidectomy	4	-2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
	2 (90) ^{[8] [9]}	Symptom improvement	Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy	4	-2	0	0	0	Low	Quality points deducted for sparse data, and for methodological limitations (open-label nature of trials and lack of statistical analysis between groups)
	2 (90) ^{[8] [9]}	Quality of life	Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy	4	-3	0	0	0	Very low	Quality points deducted for sparse data, methodological limitations (open-label nature of trials), and incomplete reporting of results
	2 (90) ^{[8] [9]}	Adverse effects	Haemorrhoidal artery ligation versus open excisional (Milligan-Morgan) haemorrhoidectomy	4	-3	0	0	0	Very low	Quality points deducted for sparse data, methodological limitations (open-label nature of trials and lack of statistical analysis of between-group difference for some outcomes), and incomplete reporting of results
	6 (441) ^{[10] [11] [12] [13]}	Symptom improvement	Haemorrhoidal artery ligation versus stapled haemorrhoidectomy	4	-1	0	-1	0	Low	Quality point deducted for methodological limitations (self-reporting of some outcomes, open-label nature of 2 RCTs); directness point deducted for uncertainty about baseline severity of haemorrhoids in meta-analysis
	1 (169) ^[11]	Length of hospital stay	Haemorrhoidal artery ligation versus stapled haemorrhoidectomy	4	-2	0	-1	0	Very low	Quality points deducted for sparse data and open-label nature of trial; directness point deducted for imbalance in use of local or pudendal anaesthesia after surgery
	2 (259) ^{[12] [13]}	Quality of life	Haemorrhoidal artery ligation versus stapled haemorrhoidectomy	4	-2	0	0	0	Low	Quality points deducted for weak methods (open-label nature of 1 RCT and lack of detail on method of randomisation) and incomplete reporting (lack of statistical assessment for between group comparison in one RCT)

Important outcomes		Adverse effects, Length of hospital stay, Quality of life, Symptom improvement							
Studies (Participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
6 (441) ^[10] ^[11] _[12] _[13]	Adverse effects	Haemorrhoidal artery ligation versus stapled haemorrhoidectomy	4	-1	0	-1	0	Low	Quality point deducted for methodological limitations (open-label nature of 2 RCTs); directness point deducted for uncertainty about baseline severity of haemorrhoids in meta-analysis

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.