

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

INTERVENTIONAL PROCEDURES PROGRAMME

Interventional procedure overview of percutaneous endoscopic colostomy

Introduction

This overview has been prepared to assist members of the Interventional Procedures Advisory Committee (IPAC) in making recommendations about the safety and efficacy of an interventional procedure. It is based on a rapid review of the medical literature and specialist opinion. It should not be regarded as a definitive assessment of the procedure.

Date prepared

This overview was prepared in August 2005.

Procedure name

- Percutaneous endoscopic colostomy.
- Percutaneous endoscopic sigmoid colostomy

Specialty societies

- Association of Coloproctology of Great Britain and Ireland.
- British Society of Gastroenterology.

Description

Indications

Percutaneous endoscopic colostomy is indicated primarily for recurrent sigmoid volvulus and colonic pseudo-obstruction. It has also been suggested as being useful in the treatment of refractory constipation and faecal incontinence.

Sigmoid volvulus is more common in individuals over age 60, and in those with Hirschsprung's disease. It is also particularly common in cases of long-standing chronic constipation. Sigmoid volvulus can be life threatening and diagnosis must be prompt to avoid sigmoid colon ischaemia and associated morbidity or possible mortality.

Evacuation disorders are common in both adults and children but may pose particular problems in individuals with neurological conditions such as spinal cord injury and multiple sclerosis.

Current treatment and alternatives

Percutaneous endoscopic colostomy (PEC) offers an alternative treatment for patients who have tried conventional treatment options without success or who are unfit for surgery.

Existing surgical techniques as an alternative to PEC are major operations and include sigmoidopexy, sigmoidoplasty, and trephine stoma to resection with primary anastomosis. Additionally, these treatment options have varying success and open resection may be contraindicated for frail, elderly patients or the severely immunocompromised.

What the procedure involves

PEC is a technique that has evolved from the percutaneous endoscopic gastrostomy (PEG) technique.

Before the procedure, patients require a bowel preparation to clean the bowel and intravenously administered antibiotics. Under intravenous sedation and local anaesthetic a colonoscope is inserted into the left colon per rectum until transillumination is seen through the skin surface and finger pressure indents the colon. The PEG tube kit is passed through the scope with the snare. A small incision is then made in the skin and a hollow needle is passed through the abdominal wall into the bowel. The snare passes over the visualised needle to grasp it and is then withdrawn with the wire and colonoscope through the anal canal.

The PEC tube is then tied with wire, pulled retrogradely through the bowel and abdominal wall, and secured against the abdominal wall. The colonoscope is reinserted to check the final position of the tube. The PEC tube is then attached to a drainage bag, flushed twice a day and antibiotics are administered for around 5 days postoperatively.

Efficacy

There is limited published evidence on this procedure. The largest published series on this procedure reports on 15 children with refractory constipation¹. Fourteen children underwent the procedure and six were followed up for 12 months. All children evaluated at 12 months were socially clean, with two children able to have the device removed. In another case series 14 patients with recurrent sigmoid volvulus underwent percutaneous endoscopic colostomy². At a mean follow-up of 12.6 months, five patients whose tubes had been left in situ remained recurrence free.

The Specialist Advisors stated that patient selection was important, and noted that outcomes seemed to be better in patients with sigmoid volvulus rather than incontinence or constipation.

Safety

The most common complications reported in the published literature were granular formation and infection. Other reported complications included pain, colonic leakage and tube erosion. Unpublished data from a multicentre UK audit reported a 12% (13/105) infection rate following the procedure⁴. Two deaths were also reported in patients with recurrent sigmoid volvulus due to late tube dislodgement. There were seven other cases of reported tube dislodgement following the procedure as well as four cases of migration. However, care should be taken when referring to these

figures because the data is preliminary, collection is ongoing and results are potentially subject to change.

The Specialist Advisors listed potential complications as infection, perforation leading to peritonitis, bleeding, stomal retraction, stomal ischameia and stomal prolapse.

Literature review

Rapid review of literature

The medical literature was searched to identify studies and reviews relevant to percutaneous endoscopic colostomy. Searches were conducted via the following databases, covering the period from their commencement to August 2005: MEDLINE, PREMEDLINE, EMBASE, Cochrane Library and Science Citation Index. Trial registries and the Internet were also searched. No language restriction was applied to the searches.

The following selection criteria (Table 1) were applied to the abstracts identified by the literature search. Where these criteria could not be determined from the abstracts the full paper was retrieved

Table 1 Inclusion criteria for identification of relevant studies

Characteristic	Criteria
Publication type	Clinical studies included. Emphasis was placed on identifying good quality studies. Abstracts were excluded where no clinical outcomes were reported, or where the paper was a review, editorial, laboratory or animal study. Conference abstracts were also excluded because of the difficulty of appraising methodology (but included in Appendix A).
Patient	Patients with disorders of the sigmoid colon.
Intervention/test	Percutaneous endoscopic colostomy.
Outcome	Articles were retrieved if the abstract contained information relevant to the safety and/or efficacy.
Language	Non-English-language articles were excluded unless they were thought to add substantively to the English-language evidence base.

List of studies included in the overview

This overview is based on three case series and an unpublished audit report.

Appendix A lists additional studies not included in the main data extraction table.

Existing reviews on this procedure

No reviews were identified on this procedure.

Table 2 Summary of key efficacy and safety findings on percutaneous endoscopic colostomy

Abbreviations used: PEC – percutaneous endoscopic colostomy; RSV – Recurrent sigmoid volvulus

Study details	Key efficacy findings	Key safety findings	Comments
<p>Rawat et al (2004)¹</p> <p>UK</p> <p>March 1999 – December 2002</p> <p>15 children with refractory constipation</p> <p>Median age: 5.5 years (range 2–10 years)</p> <p>Follow-up: 12.5 months (range 2–51 months)</p> <p>Patient characteristics: All children were faecally incontinent and had undergone a variety of conventional treatments. All had optimal medical therapy for a minimum of 1 year</p>	<p>Outcomes assessed: continence, time taken, hospital stay</p> <p>Continence 13 children were evaluated at 2 months, with 12 children having clean scores of 2 or more. One child with a score of 1 at 2 months developed problems with faecal impaction and required manual evacuation</p> <p>Six children followed for 12 months all remained socially clean (scores of 2 or above), with 2 children being able to have the device removed</p> <p>Time for the procedure: median 30 minutes (range 20–45 minutes)</p> <p>Hospital stay: median 4 days (range 2–27 days)</p> <p>Authors note that there was no report of significant impedence to daily activities following the procedure</p>	<p>Complications</p> <p>Major 1 child with Hirschsprung's disease was found to have enterocolitis at endoscopy. This was complicated by sepsis, necessitating removal of the PEC tube and performance of a colostomy.</p> <p>Minor 6 cases of granuloma formation 3 cases of local tract infection 1 case of abdominal pain associated with administration of enemas</p> <p>1 child was not able to have PEC inserted due to technical difficulties</p>	<p>Clinical progress was reviewed in a joint paediatric gastroenterology/surgery clinic at 2, 6 and 12 months, and biannually thereafter.</p> <p>'Clean score' was devised to assess the clinical response:</p> <ul style="list-style-type: none"> • 0 daily soiling (same as preprocedure) • 1 less soiling but still dirty • 2 mostly clean but occasion accidents • 3 no soiling between spontaneous or enema-induced evacuation <p>Text and graphs do not reconcile in respect of continence outcome.</p> <p>Not all figures are reported in the text.</p>

Abbreviations used: PEC – percutaneous endoscopic colostomy; RSV – Recurrent sigmoid volvulus

Study details	Key efficacy findings	Key safety findings	Comments
<p>Daniels et al. (2000)²</p> <p>UK</p> <p>14 patients with recurrent sigmoid volvulus</p> <p>Mean age: 78 years (53–99 years)</p> <p>Patient characteristics: patients in whom conventional surgery considered unsafe or inappropriate</p> <p>Follow-up: mean 12.6 months (range 7–21 months)</p>	<p>Outcomes assessed: recurrent volvulus</p> <p>Tube removal: First 8 patients had removal of tubes at 6 weeks but 3/8 patients (37.5%) had recurrent volvulus</p> <p>5/8 (62.5%) tubes changed for flat Mic-Key tubes and left in situ indefinitely with no recurrence of volvulus in follow-up period</p>	<p>Complications</p> <p>1 patient (7%) with a cognitive impairment pulled out the tube at 24 hours and underwent sigmoid resection – outcome not described</p> <p>3 patients (21%) died from other causes at 6–24 months</p>	<p>Limited information available on outcomes.</p> <p>Outcome measures not defined. It appears that the outcome is whether this procedure has decompressed presenting volvulus and prevented further recurrent volvulus.</p> <p>Would appear that only the results of the first eight patients are reported.</p>

Abbreviations used: PEC – percutaneous endoscopic colostomy; RSV – Recurrent sigmoid volvulus

Study details	Key efficacy findings	Key safety findings	Comments
<p>Haddad et al (2002)³</p> <p>UK</p> <p>6 children with intractable constipation</p> <p>Median age: 5 years (range 4–15 years)</p> <p>Patient characteristics: All children were faecally incontinent and had undergone a variety of conventional treatments</p> <p>Follow-up: 4–22 months</p>	<p>Outcomes assessed: continence, time taken, hospital stay</p> <p>Continence 5/6 children had sustained improvement at their latest follow-up (4 children clean score 3, 1 child clean score 2)</p> <p>One child with a score of 1 at 2 months developed problems with faecal impaction and required manual evacuation</p> <p>Time for the procedure: Median 30 minutes (range 20–45 minutes)</p> <p>Hospital stay: 1–4 days</p>	<p>Complications</p> <p>4 cases of granuloma formation 5 cases of leakage 2 cases of infection around the surrounding skin 1 case of abdominal pain associated with administration of enemas</p> <p>In one case the PEC tube eroded but was easily replaced by a larger button device, although a general anesthetic was required for this procedure</p>	<p>Same study centre as (1) – unclear if the children in this study are included in the other paper (1). From the tables it would appear that these are different patients but the text seems to indicate some patients are the same.</p> <p>Same 'clean score' was used to assess continence as above (1).</p> <p>.</p>

Abbreviations used: PEC – percutaneous endoscopic colostomy; RSV – Recurrent sigmoid volvulus

Study details	Key efficacy findings	Key safety findings	Comments
<p>Simson (2005)⁴</p> <p>Preliminary audit results (unpublished)</p> <p>105 patients:</p> <ul style="list-style-type: none"> • 48 recurrent sigmoid volvulus Mean age 80 years (range 45-97 years) • 37 patients with bowel dysfunction due to neurological disease Mean age 50 years (range 7-86 years) • 6 patients with constipation Mean age 42 years (range 31-43 years) • 2 patients with obstructed defaecation Age 55,57 years) • 9 patients with chronic intestinal pseudo-obstruction Mean age 77 years (range 22-83 years) • 3 patients with acute intestinal pseudo-obstruction Mean age 78 years (range 70-80 years) 	<p>Outcomes assessed: continence</p> <p>Recurrent sigmoid volvulus No recurrences in those patients whose PEC tubes have remained in situ with 432 patient months of follow-up 4 patients who had tubes removed developed recurrent volvulus</p> <p>Bowel dysfunction due to neurological disease (37 patients). Antegrade irrigation of the left colon and rectum resulted in significant improvement and quality of life in 31 of the 37 patients.</p> <p>6 patients PEC failed</p> <p>Constipation and obstructed defaecation:. Author notes that the results in this group were not very satisfactory.</p> <p>Intestinal pseudo-obstruction: Author reports that the procedure was successful in this group of patients</p>	<p>Complications (n = 105)</p> <p>2 deaths due to late tube dislodgement (both recurrent sigmoid volvulus)</p> <p>4 cases of early dislodgement (three cases RSV, 1 acute intestinal pseudo-obstruction)</p> <p>5 cases of late dislodgement</p> <p>4 cases of bumper migration</p> <p>13 cases of sepsis</p>	<p>Preliminary data from multicentre audit of percutaneous endoscopic colostomy (PEC).</p> <p>Limited information on outcomes.</p>

Validity and generalisability of the studies

- There is limited published evidence on this procedure, with most data on this procedure being unpublished.
- The literature reports on small number of patients with varying indications.
- The studies that are published are in general of poor methodological quality. Few safety data are reported and quality of life has not been assessed systematically in any of the published series.
- A number of case reports have been published on this procedure. However case reports are by their nature a biased sample because they report on patients of particular interest rather than those typically selected to undergo the procedure.
- Although the unpublished data capture most of the UK experience, the results are still preliminary and little information has been reported on efficacy outcomes.
- It is possible that the some of the patients reported in the published literature are also included in the unpublished audit data.

Specialist Advisors' opinions

Specialist advice was sought from consultants who have been nominated or ratified by their Specialist Society or Royal College.

Mr Azad Najimaldin, Dr Graeme Duthie, Dr Hugh Gallagher, Dr Kenneth Hosie, Dr Robin Teague, Mr Jay Simson

- Most Specialist Advisors felt the procedure was established or no longer new.
- Fewer than 10 percent of doctors are thought to perform the procedure in district general hospitals.
- A major issue is appropriate patient selection. For elderly patients or patients with significant comorbidity the procedure is very beneficial.
- The efficacy of use in recurrent sigmoid volvulus is established, but for constipation and incontinence further assessment may be required.

Issues for consideration by IPAC

A registry is maintained on this procedure (preliminary data are included in the overview 4).

There is currently a study underway at the specialist constipation clinic at the University Hospital of North Durham. The study is evaluating the efficacy of percutaneous endoscopic colostomy in patients with severe neurological constipation.

References

- 1 Rawat DJ, Haddad M, Geoghegan N, et al. (2004) Percutaneous endoscopic colostomy of the left colon: a new technique for management of intractable constipation in children. *Gastrointestinal Endoscopy* 60(1):39–43.
- 2 Daniels IR, Lamparelli MJ, Chave H, et al. (2000) Recurrent sigmoid volvulus treated by percutaneous endoscopic colostomy. *British Journal of Surgery* 87(10):1419.
- 3 Haddad M, Clarke S, Fell JM. (2002) Percutaneous endoscopic colostomy of the left colon: A new technique for the management of intractable chronic constipation. *Pediatric Endosurgery & Innovative Techniques* 6(3):207–10.
- 4 Simson JN (2005) Preliminary data from multi-centre audit of percutaneous endoscopic colostomy (PEC). Unpublished
- 5 Simson JN, Rice-oxley M, Eltringham MT, et al. (2004) Percutaneous Endoscopic Colostomy (PEC) in faecal incontinence in central neurological disease. *Colorectal Disease* 6[Suppl], 24.
- 6 Eltringham MT, Watson C, Bain IM, et al. (2004) Percutaneous endoscopic colostomy (PEC) - Role in recurrent sigmoid volvulus and chronic constipation. *Gut* 53:71.
- 7 Thompson AR, Pearson T, Ellul J, et al. (2004) Percutaneous endoscopic colostomy in patients with chronic intestinal pseudo-obstruction. *Gastrointestinal Endoscopy* 59(1):113–5.
- 8 Gauderer MW, Decou JM, Boyle JT. (2002) Sigmoid irrigation tube for the management of chronic evacuation disorders.[see comment]. *Journal of Pediatric Surgery* 37(3):348–51.
- 9 Heriot AG, Tilney, HS and Simson JNL. (2002) The application of percutaneous endoscopic colostomy to the management of obstructed defecation. *Diseases of the Colon and Rectum* 45(5):700-702.
- 10 Gomez HH, Paul DL, Pinto P, et al. (2001) Placement of a colonic stent by percutaneous colostomy in a case of malignant stenosis. *Cardiovascular & Interventional Radiology* 24(1):67–9.
- 11 Brown SR, Holloway B, Hosie KB. (2000) Percutaneous endoscopic colostomy; an alternative treatment of acute colonic pseudo-obstruction. *Colorectal Disease* 2(6):367–8.

Appendix A: Additional papers on percutaneous endoscopic colostomy not included in the summary tables

The following table outlines the studies that are considered potentially relevant to the overview but were not included in the main data extraction table. It is by no means an exhaustive list of potentially relevant studies or abstracts presented at conferences.

Study Details	Key efficacy findings	Key safety findings	Comments/ Reasons for non-inclusion
<p>Simson et al (2004)⁵ UK</p> <p>26 patients</p> <ul style="list-style-type: none"> • 9 multiple sclerosis • 7 spina bifida • 4 tetraparesis • 3 Parkinsons • 1 Alzheimer's • 1 motor neurone • dystonia syndrome <p>Age 7–86 years</p>	<p>Twenty-two (85%) patients had good outcomes with PEC.</p> <ul style="list-style-type: none"> • 2 patients need laxatives to achieve successful evacuation • 2 patients converted to ACE or a stoma 	<p>4 patients had minor local sepsis and two tubes were replaced because of buried bumper</p>	<p>Abstract – limited information.</p> <p>Few outcomes were measured.</p> <p>Follow-up unclear.</p>
<p>Eltringham MT et al (2004)⁶ UK</p> <p>19 patients</p> <ul style="list-style-type: none"> • 13 patients chronic constipation • 8 patients recurrent sigmoid volvulus <p>Median follow-up: 8 months (range 1–26 months)</p>	<p>Authors state that there were functional improvements in symptoms and transit study results in the CC group.</p>	<p>Authors note that 8 tubes have been removed due to site infection</p> <ul style="list-style-type: none"> • 7 tubes in the constipation group • 1 tube in the recurrent sigmoid volvulus group 	<p>Abstract – limited information on outcomes.</p> <p>Patients symptoms were assessed pre and post procedure using the SF-36 and the GIQLI systems.</p>
<p>Thompson et al (2004)⁷ UK</p> <p>3 patients with chronic intestinal pseudo-obstruction whose symptoms were not controlled by conservative measures</p>	<p>Authors note that all 3 patients noted improvements in symptoms</p>	<p>Authors note that there were no PEC procedure related complications</p>	<p>Limited information on outcomes.</p> <p>Unclear how outcomes were assessed.</p>

Study Details	Key efficacy findings	Key safety findings	Comments/ Reasons for non-inclusion
<p>Gauderer et al (2002) ⁸ USA</p> <p>4 patients with evacuation disorders that had non responded to conservative treatment</p> <p>Age 4–18 years</p> <p>Follow up: range 3–27 months</p>	<p>Authors state that all patients achieved prompt evacuation</p>	<p>Authors note that there were no operative complications</p> <p>One case of cellulitis but resolved with antibiotics</p>	<p>Limited information on outcomes.</p> <p>Unclear how outcomes were assessed.</p>
<p>Heriot et al. (2002) ⁹ UK</p> <p>Case report:</p> <p>52 year old woman presenting with a 17-year history of severe difficulty of bowel evacuation</p>	<p>Patient able to evacuate within 10 minutes</p> <p>Abdominal pain ceased, All analgesia ceased</p> <p>No skin problems around site</p> <p>Asymptomatic at 6 months</p> <p>Improved quality of life</p>	<p>Developed small amount of faecal ooze around PEC tube which was replaced at 6 weeks with a flat Mic-Key tube; all leakage stopped</p> <p>No other safety data have been reported</p>	<p>Limited information on outcomes.</p> <p>Invited comment section ' There have been no complications of the tube at six months follow-up'.</p>
<p>Gomez et al. (2001) ¹⁰ Spain</p> <p>Case report:</p> <p>57 year old man presented with gastric signet ring cell carcinoma.</p> <p>Palliative care treatment for bowel obstruction involved insertion of a colonic stent using percutaneous colostomy of the transverse colon</p>	<p>Tube removed at POD 6 without complications</p> <p>No peritonitis</p> <p>Able to defecate</p> <p>Stent remained functional until time of death</p>	<p>Patient died 14 days after procedure due to the advanced underlying disease, not related to the insertion of the tube</p>	<p>Limited information on outcomes.</p> <p>Author's comments: importance in achieving adequate decompression of the descending colon through the stent catheter can be removed without risk of peritonitis or formation of fistulas.</p>
<p>Brown et al. (2000) ¹¹ UK</p> <p>71 year old presented with persistent colonic pseudo-obstruction on 9th visit.</p> <p>73 year old developed a colonic pseudo-obstruction</p>	<p>Case 1- colon decompressed rapidly, 5 days after procedure</p> <p>Patient has remained symptom free and has avoided readmission in over 12 months</p> <p>Case 2 - Patient improved rapidly and was discharged 10 days later. Tube was removed 28 days later patient was well 3 months later</p>	<p>No safety data have been reported</p>	<p>Limited information about outcomes.</p> <p>Two case reports.</p>

Appendix B: Literature search for percutaneous endoscopic colostomy

The following search strategy was used to identify papers in Medline. A similar strategy was used to identify papers in EMBASE, Current Contents, PreMedline and all EMB databases.

For all other databases a simple search strategy using the key words in the title was employed.

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1  endoscop$.tw.
2  (minimal$ adj3 surg$).tw.
3  (minimal$ adj3 invasive).tw.
4  (minimal$ adj3 access).tw.
5  MIS.tw.
6  ENDOSCOPY, GASTROINTESTINAL/
7  Surgical Procedures, Minimally Invasive/
8  Catheters, Indwelling/
9  or/1-8
10 Colostomy.tw.
11 COLOSTOMY/
12 10 or 11
13 9 and 12
14 IRRIGATION/
15 DEFECATION/
16 def?ecation.tw.
17 sigmoid$.tw.
18 left colon.tw.
19 Sigmoid Diseases/
20 Intestinal Obstruction/su [Surgery]
21 COLONIC PSEUDO-OBSTRUCTION/su [Surgery]
22 DECOMPRESSION, SURGICAL/
23 ogilvie syndrome.tw.
24 colon lavage.tw.
25 (bowel obstruct$ or colon obstruct$).tw.
26 CONSTIPATION/
27 or/14-26
28 13 and 27
29 Animals/
30 Humans/
31 29 not (29 and 30)
32 28 not 31

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Procedure number: 074	Procedure Name: Percutaneous endoscopic colostomy	
Databases	Version searched (if applicable)	Date searched
The Cochrane Library	2005 Issue 3	24.8.2005
CRD	July 2005	24.8.2005
Embase	1996 to 2005 Week 34	23.8.2005
Medline	1996 to August Week 2 2005	23.8.2005
Premedline	August 22, 2005	23.8.2005
CINAHL	1982 to August Week 2 2005	23.8.2005
British Library Inside Conferences (limited to current year only)	1993-date	24.8.2005
National Research Register	2005 Issue 3	24.8.2005
Controlled Trials Registry	N/A	24.8.2005