

## INVESTIGATION OF COLORECTAL DISORDERS

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### Symptoms of colorectal disorders

*General*—Malaise; weight loss; vomiting

*Abdominal*—Pain (constant or colic); distension; borborygmi

*Bowel habit*—Altered frequency; constipation; diarrhoea; taking laxative and anti-diarrhoeal drugs; stool consistency; bleeding (bright red, mixed in motion, dark, altered); slime (mucus)

*Anal and perineal*—Pruritus; pain and its relation to defecation; prolapse; continence and incontinence; discharge; tenesmus; swelling (painful or painless)

When investigating a patient for colorectal disorders a detailed history is important and will provide clues to the diagnosis. Symptoms arising from the large bowel tend to be non-specific and are often difficult to interpret. There is a wide variation in bowel habit, so alterations from a patient's normal bowel pattern, changes in longstanding symptoms, and the passage of blood and mucus are of most importance.

Colorectal disorders are associated with several systemic manifestations which may hint at the underlying diagnosis. Anaemia is associated with neoplasia and inflammatory bowel disease; dermatoid cysts with Gardner's syndrome; acanthosis nigricans and dermatomyositis with neoplasia; and pyoderma gangrenosum, arthropathy, uveitis, and finger clubbing all with inflammatory bowel disease.

### Abdominal examination

#### Differential diagnosis of lower abdominal mass

*Left iliac fossa*

- Carcinoma of the sigmoid colon
- Diverticular disease

*Right iliac fossa*

- Carcinoma of the caecum
- Crohn's disease
- Abscess of the appendix
- Ileocaecal tuberculosis
- Actinomycosis
- Intussusception

*Either*

- Ovarian mass
- Ectopic kidney
- Transplanted kidney

Ideally the patient should be comfortable, relaxed, and supine for abdominal examination. The abdomen should be inspected for distension and visible peristalsis. Gentle palpation will often reveal a palpable sigmoid colon, which can be considered a normal finding in constipated patients. Diverticular disease and colonic cancer may manifest as palpable masses. Palpation of the liver may disclose secondary spread in patients with colorectal cancer.

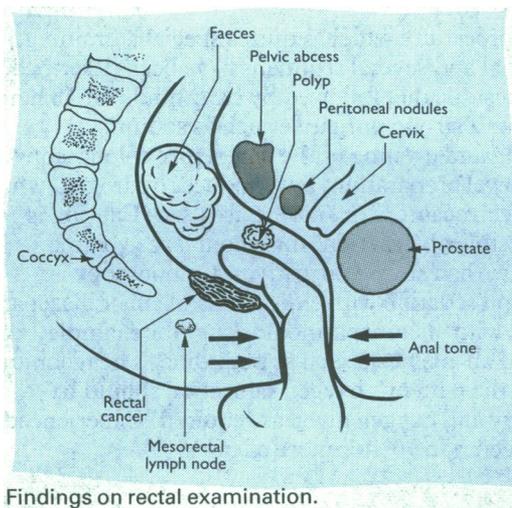
The characteristic rebound tenderness associated with peritonitis should be elicited by gentle percussion and not by the sudden release of a deeply palpating hand, which is less sensitive and causes extreme discomfort in patients with peritonitis.

### Anorectal examination

#### Findings on anal inspection

- Pruritus ani
- Perianal warts
- Perianal abscess
- Perianal haematoma
- Prolapsing haemorrhoids
- Thrombosed haemorrhoids
- Skin tags
- Fistula-in-ano
- Fissure-in-ano
- Anal cancer
- Rectocele
- Rectal prolapse
- Faecal soiling of perineum

The rectum and anus are readily accessible, so their clinical examination is often the mainstay of diagnosis. Few patients relish this examination, which should be indicated and not performed "routinely." Patients feel embarrassed and exposed, and anxiety provokes spasm of the anal sphincters and buttocks. This is exacerbated by a rough technique, which results in an unpleasant examination with little yield. Fears are allayed by prior explanation. Patients should be placed in the left lateral position with a pillow under the hip and covered with a blanket. They are warned that although they may feel they are losing control of their continence during the examination, an "accident" is unlikely.

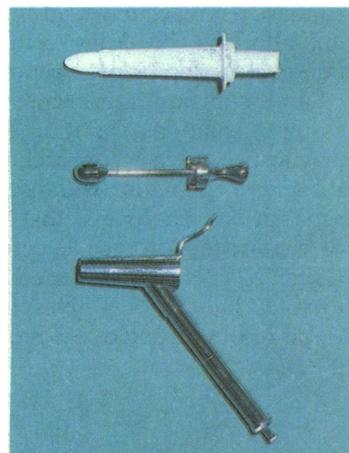


Findings on rectal examination.

### Digital examination

Examination begins with inspection of the anus under good lighting. Many pathological conditions such as skin tags in Crohn's disease are immediately obvious and may indicate underlying rectal or colonic pathology. The state of anal tone is observed at rest and on voluntary contraction. The patient is asked to "strain down," as if defecating, to show perineal descent, prolapsing haemorrhoids, or protruding lesions such as rectal prolapse and tumours.

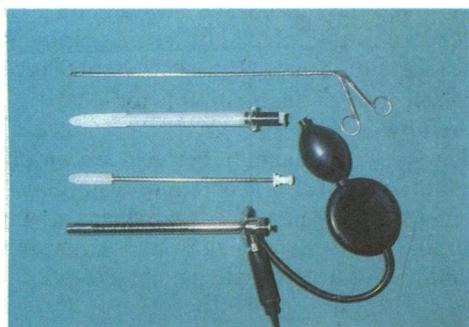
A gloved lubricated finger is placed flat on the anus. Gentle pressure is applied until the sphincter yields and the finger glides into the anus. The rectal contents and mucosa within reach of the finger are palpated. The prostate or cervix is noted, together with any extrarectal lesions. The patient is asked to tighten the anus to assess sphincter tone, and the puborectal muscle is felt by hooking the finger over it. If lesions are discovered their mobility over the surrounding tissues is assessed. Chronic anal fissures and induration from fistulas may be felt, but haemorrhoids are not usually palpable. The withdrawn finger is inspected for blood, mucus, and pus and the nature of the faeces noted.



Proctoscopes: (Top) Disposable proctoscope; (middle) obturator for proctoscope; (bottom) reusable metal proctoscope.

### Proctoscopy

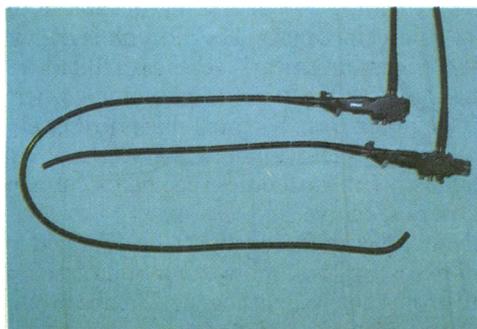
After digital examination the anal canal is inspected with a proctoscope. A disposable proctoscope with fibreoptic lighting is preferred. It is inserted with the obturator in place, until the sphincter resistance is overcome, after which the obturator is removed. The lower rectal mucosa is seen and the proctoscope slowly withdrawn, showing the haemorrhoidal cushions, the dentate line, and the anal epithelium. It is useful to ask the patient to "bear down" during withdrawal in order to demonstrate prolapsing mucosa and haemorrhoids. The examination may need to be repeated for complete assessment.



Rigid sigmoidoscopes: (from top to bottom) Biopsy forceps; disposable sigmoidoscope; obturator for sigmoidoscope; metal reusable sigmoidoscope with connected light source and bellows for insufflation.

### Sigmoidoscopy

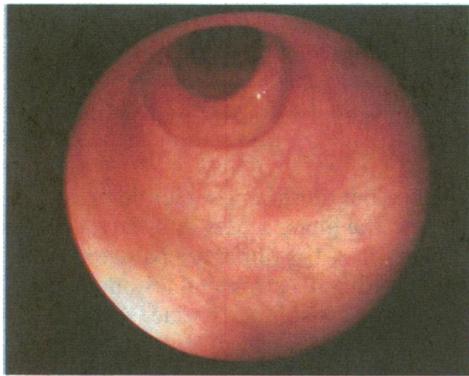
*Rigid sigmoidoscopy* is easily performed in the outpatient clinic, and only in exceptional circumstances is a general anaesthetic necessary. The initial examination should be without bowel preparation, which is irritant and may evoke changes mimicking proctitis. Complete visualisation of the rectum is usually possible, but a disposable phosphate enema may help if the rectum is loaded with faeces. The instrument is introduced in the same manner as the proctoscope and slowly advanced along the lumen of the rectum, displacing the mucosal folds by gentle inflation and angulation of the instrument. The tip of the sigmoidoscope should be advanced only when the lumen ahead is visible. It is usually possible to negotiate the rectosigmoid angulation, but care is needed to reduce discomfort and pain from distortion of the anus and stretching of the colonic wall. Biopsy samples of protuberant lesions can be taken with impunity, but mucosal lesions should be biopsied only below 10 cm with rigid biopsy instruments. Rupture of the rectum during sigmoidoscopy is inexcusable.



(Top) Colonoscope; (bottom) flexible sigmoidoscope.

*Flexible sigmoidoscopy*—Flexible fibreoptic sigmoidoscopy allows examination up to 60 cm from the anal margin and can usually be performed without sedation in less than 10 minutes. Bowel preparation with a disposable phosphate enema is usually sufficient. Fibreoptic instruments are more expensive than rigid sigmoidoscopes and need more complex cleansing and maintenance by specially trained staff, and they are less suited to a busy outpatient clinic. The yield of pathological abnormalities is, however, greater than with rigid instruments and about 70% of colorectal carcinomas are within reach of the flexible sigmoidoscope.

## Colonoscopy



Normal colon viewed through a colonoscope.

Colonoscopy is a skilled procedure which requires specialist training. Bowel preparation is essential and several regimens have been described. Patients should take a low residue diet followed by clear fluids for 48 hours before colonoscopy, and take a strong purgative such as sodium picosulphate on the morning and evening of the day before colonoscopy. Mannitol produces rapid bowel preparation, but produces hydrogen, which is potentially explosive if electrocautery or snaring are used. Caution is needed in patients with possible obstruction, for whom large volume enemas are more appropriate than strong purgatives. Colonoscopy is usually performed under light sedation with either midazolam or diazepam. This is often supplemented with an antispasmodic drug (for example, hyoscine butylbromide) and an analgesic such as pethidine. The technique induces hypoxia, so ideally the patient's oxygen saturation should be monitored by pulse oximetry and oxygen given as required. Experienced colonoscopists reach the caecum in 90% or more of cases.

## Barium enema examination



Double contrast barium enema showing diverticular disease.

A single contrast barium enema examination is inaccurate and shows only extreme abnormalities. A limited examination may be used to confirm mechanical blockage rather than pseudo-obstruction before operating for suspected large bowel obstruction. A double contrast barium enema examination entails insufflation of air after evacuation of barium. This provides fine mucosal detail and the diagnostic accuracy approaches that of colonoscopy. Double contrast barium enema examination will disclose gross anatomy and extracolonic abnormalities such as fistulas that are not easily seen on endoscopy. Colonoscopy is more sensitive for detecting fine mucosal abnormalities; biopsy samples can be taken and therapeutic procedures such as polypectomy performed. The choice of investigation may be dictated by the availability of local resources and expertise.

## Imaging

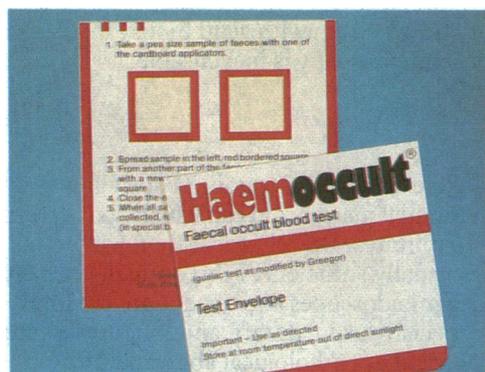


Ultrasound scan showing hepatic metastases.

Preoperative abdominal ultrasonography may show clinically inapparent metastases in patients with colorectal cancer. Rectal ultrasonography with an intraluminal probe provides information about the local extent of cancers which may be useful in staging, selecting patients suitable for local resection, and planning radiotherapy.

Preoperative computed tomography and magnetic resonance scanning provide more accurate information about the local extent of rectal cancers and are more sensitive at detecting hepatic metastases than does abdominal ultrasonography. However, intraoperative ultrasonography is emerging as the most sensitive imaging technique for detecting hepatic metastases.

## Faeces



Haemoccult test card. The patient smears faeces on the test squares. Hydrogen peroxide is applied in the laboratory. A blue colour change indicates occult blood in the faeces.

The detection of occult blood in the faeces is important in the investigation of patients with unexplained iron deficiency anaemia and forms the basis of screening for colorectal cancer. Haemoccult is the most widely used test for screening. The patient smears faeces on a filter impregnated with guaiac acid. This is returned to the laboratory, where hydrogen peroxide is added. If haematin from haemoglobin is present in the faeces it catalyses the oxidation of guaiac acid, giving a characteristic colour change to blue. Immunological tests with antibodies specific for human haemoglobin may prove to be more sensitive.

If infection is suspected fresh samples of faeces should be obtained for microbiological examination. Microscopy will show any mobile amoebas and parasitic cysts; culture will grow bacterial pathogens. Toxins produced by *Clostridium difficile* may be identified in patients with pseudomembranous colitis.

## Anorectal function tests



Anal manometry probe.



Plain abdominal radiographs showing the progress of ingested radio-opaque markers used to evaluate colonic transit time: (top) in the stomach after ingestion; (bottom) three days later the markers are scattered around the colon.

The objective assessment of anorectal physiology is playing an expanding part in the understanding and management of patients with faecal incontinence, sphincter injuries, rectal prolapse, and abnormalities of defecation. The pathogenesis of these disorders is incompletely understood and the full significance of many of these measurements uncertain at present.

Anal manometry is performed, preferably by using air filled or, more commonly, water perfused balloon systems. Solid state transducers are more convenient but less reliable. Maximum resting and squeeze pressures are recorded, which measure internal and external sphincter mechanism function, respectively. Pressures decrease with age and they are commonly reduced in incontinent patients. Rectal compliance is measured by filling a rectal balloon and recording the volume and pressure at first sensation and noting the maximum capacity the patient will tolerate. Patients with inflammatory conditions have decreased compliance, while those with faecal impaction and constipation may tolerate large volumes and high pressures. Sphincter motor nerve function and muscle activity are assessed by electromyography with fine electrodes. This information is of help in mapping sphincter defects which may be repairable. Neuropathic damage to the pudendal nerve is assessed by measuring pudendal nerve motor latency, which is the time taken for an impulse to travel from the ischial spine to the sphincter.

The rectoanal reflex causes a reduction in resting pressure when filling a rectal balloon, representing reflex inhibition of sphincter contraction. The reflex is lost in patients with Hirschsprung's disease owing to aganglionosis and may be absent in patients with rectal prolapse and incontinence if resting pressures are already low.

Anal sensation is measured by applying an electric current or thermal stimulus to the anal epithelium until the threshold of sensation is reached. Loss of sensation may be important in the aetiology of incontinence in patients who have had previous anorectal surgery.

Proctography with barium suspensions is used to measure the anorectal angle. Patients with incontinence often have obtuse angles secondary to pelvic floor weakness. A videoproctogram records the expulsion of a thick barium suspension, simulating defecation, and will show prolapse, rectoceles, and the function of ileoanal reservoirs. Colonic transit is studied by ingestion of special radio-opaque markers, which can be followed by plain abdominal radiography.

The photographs were produced by the department of medical illustration, Salford Health Authority. The line drawing was prepared by Paul Somerset, medical illustration department, Wythenshawe Hospital.

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The ABC of Colorectal Diseases has been edited by Mr D J Jones and Professor M H Irving.

### THE MEMOIR CLUB

Surgeons are by nature individualists. They continually perform their highly skilled craft before a critical and knowledgeable audience. The things that really matter they do themselves. A surgeon has something in common with an actor: there is no cover up; he succeeds or fails on his own, however large and however efficient his supporting cast may be. He needs experience born of long apprenticeship and developed in practice, judgment founded on knowledge of the natural history of disease and the needs of individual patients, and an expertise grounded in anatomy and physiology supported by pathology and applied with a high degree of technical skill.

The surgeons of the old days would tackle anything that came their way. A few gave rein to their grandiosity and behaved like prima donnas, but their eccentricities and unreasonable demands were accepted and readily forgiven by their hard pressed theatre sisters and aspiring assistants just so long as they were good enough to earn their respect. There were a few who dealt no further with either their patients or their patients' relatives if treatment had failed, transferring them to the care of others. Some

combined greatness in their profession with wide interests in science and the arts, a deep humanity, and an erudite facility of expression. The combination when it occurs is formidable. One such was Wilfred Trotter, who became a Fellow of the Royal Society and was one of the pioneers in the surgical treatment of cancer of the pharynx. To me he was a literary artist, whose writings I found to be elegant and full of wisdom. A colleague of his said that he used the English language as he used his hands, with a delicate precision born of constant striving after perfect control. He had a sharpness of criticism and a pointed wit which his students loved to recall. It was told of him that, when one of his assistants at an operation attempted to emulate his legendary skill in using either hand, Trotter remarked "I see, sir, that you are ambisinistrous." Like the best of his profession Trotter combined great surgical skill with distinction as a scientist, teacher, and philosopher while remaining a good doctor. I worked with surgeons all my professional life with feelings compounded of admiration, respect, exasperation, and amazed affection.

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