CASE ONE

Short case number: 3_8_1
Category: Gastrointestinal & Hepatobiliary Systems
Discipline: Surgery
Setting: Emergency Department
Topic: Diverticular disease

Case

Ellen Cassidy, aged 68 years, presents with acute abdominal pain localised to the left iliac fossae. She has a swinging fever with peak temperatures of 38.9°C and suffered diarrhoea two days ago but since then has been constipated. She had an episode 1 year ago that was similar but milder as symptoms resolved in a day.

Questions

1. What further history and examination would you undertake?
2. What is the difference between diverticulosis and diverticulitis?
3. List the indications for surgery for diverticular disease?
4. Summarise the blood supply of the colon and explain the significance of anastomotic zones for surgeons
5. Summarise the principles of colonic motility & list three common organisms in the colon.
6. A number of diagnostic investigations can be ordered to investigate the colon. Briefly summarise the following: rigid sigmoidoscopy, fiberoptic sigmoidoscopy, abdominal series x-ray, barium enema, colonoscopy, angiography.

Suggested reading:

1. Henry MM, Thompson JN, editors. Clinical Surgery. 3rd edition. Edinburgh: Saunders; 2012. Chapter 23.
2. Garden OJ, Bradbury AW, Forsythe JLR, Parks RW, editors. Davidson's Principles and Practice of Surgery. 6th edition. Philadelphia: Churchill Livingstone Elsevier; 2012. Chapter 16.

ANSWERS

1. What further history and examination would you undertake?

History (SOCRATES)

- site, radiation, character of the abdominal pain, severity
- time of onset (both episodes)
- time-intensity relationships
- exacerbated by; relieved by
- associated features - appetite, weight change, night sweats, change bowel habits (diarrhoea/constipation; rectal bleeding)
- dietary features (is it related to certain foods?)
- routine GIT history (incl. systems review)

Examination

- formal GIT system examination
    - fever
    - characteristic left lower quadrant tenderness
    - ? mass
    - presence of complications (e.g. perforation/peritonitis; fistula)
- including digital rectal examination
- inguinal/femoral, supraclavicular LN's

2. What is the difference between diverticulosis and diverticulitis?

Diverticulosis (diverticular disease without complication)

- diverticulae in the colon (mucosal herniations through the muscular wall)
- asymptomatic but
- may become complicated > then symptoms develop

diverticulitis

- Inflammation / infection of one or more diverticulae
- including extension into adjacent tissue
- initiated by obstruction of the neck of the diverticulum by a faecolith
- obstruction leads to edema in the colon wall or may be complicated by micro or macro perforation. fever & leukocytosis characteristic

3. What are the indications for surgery for diverticular disease?

- ELECTIVE
    - Recurrent attacks/increasing severity
    - Younger patient
    - Chronic pain
    - Fistula formation (colo-vaginal; Colo-vesical; colo-cutaneous)
- EMERGENCY
    - Bleeding
    - Perforation (macroscopic with generalised peritonitis, or failed conservative management)
    - Obstruction

- Conservative measures (high fibre diet, supplements) not controlling symptoms
- symptoms of recurrent pain & functional changes in bowel habits become unacceptable for the patient
- perforation(s) not confined to pericolic tissues and controlled by antibiotics

4. Blood supply of the colon:

- review clinical anatomy notes & Anatomedia/Acland's for blood supply of colon
- caecum, ascending colon & most of transverse colon supplied by superior mesenteric artery
- (via ileocolic, middle colic arteries – only minority have right colic a. as well)
- splenic flexure, descending colon, sigmoid colon supplied by inferior mesenteric artery (via ascending colic and sigmoid arteries from IMA)
- superior rectum supplied by final branch of the inferior mesenteric artery (superiorrectal arteries) and middle & inferior rectum from branches of the internal pudendal arteries (inferior rectal artery).

Significance of anastomotic zones for surgeons "*marginal zones"*

- Certain parts of the colon (e.g.. splenic flexure) are at the junction of two separate blood supply systems and may be relatively poor. For this reason, anastomoses in this region would carry a higher risk of ischaemic complications

5. Principles of colonic motility:

- multiple types of contraction patterns
- segmentation contractions & mass contractions – unique to the colon, characterized by contractions of large segments of the colon, resulting in mass movement of stool.
- movement of residue through colon occurs at slow rate (18-48 hours) cf small bowel (4 hours)
- colonic transit accelerated by emotional states, diet, disease, infection, medications and bleeding

Three common organisms in the colon:

- Bacteroides fragilis
- Escherichia coli
- Enterococci (Strep. Faecalis)

6. Diagnostic investigations for the colon:

- abdominal x-ray series – supine and erect radiographs, should be obtained on any patient presenting with significant abdominal pain. Helpful in detecting pneumoperitoneum, small bowel obstruction, large bowel obstruction (volvulus, tumour), renal calculi.

- barium enema – after colon & rectum prepared, barium contrast medium introduced under mild pressure to fill the entire organ. DCBE: Air insufflation, with some intraluminal barium remaining, allows sensitive detection of polyps and small lesions. Helpful in diagnosing

tumours, diverticulosis, volvulus, sites of obstruction. Less used as colonoscopy widely available and use of CT/oral contrast or CT colonography increases.

- rigid sigmoidoscopy - now largely replaced by flexible fibre-optic (see below)

- flexible sigmoidoscopy – provides higher diagnostic yield and more comfortable for patient. Allows visualization of last 30-60cm of large bowel, and detects up to 60% of colorectal neoplasms. Has a role in screening for neoplasia and/or in centres where colonoscopy not widely practised.

- fibre-optic colonoscopy – allows visualization of the entire colon and rectum, plus/minus last few cm of terminal ileum. It also provides therapeutic options: polyp removal, colonic decompression, stricture dilatation, haemorrhage control, foreign body removal. Requires thorough bowel preparation and mild sedation. Now a primary diagnostic modality to investigate lower GIT bleeding of unknown aetiology, inflammatory bowel disease, stricture, equivocal imaging findings, lower abdominal pain, patients with PH or FH of colorectal polyps and cancer.

- angiography – useful in detecting the source of moderate or rapid colonic bleeding. It is not helpful in slow or chronic blood loss. Requires radiologic expertise, as usually an emergency procedure.

- Colonic Transit studies- for investigation of motility disorders

- Small Bowel Series/enterography – for investigation of small bowel pathology

- MRI – Inflammatory bowel disease, limited indications.