

Diverticulitis, pelvic and other intra-abdominal abscesses

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Abstract

Diverticular disease is a common condition in the Western world and it carries significant morbidity and healthcare cost. Patients with diverticular disease may present acutely or to out-patients, and the management should be stratified using clinical judgement and appropriate investigation including radiology. Intra-abdominal abscess is a common complication of diverticular disease, but it can also be due to any intra-abdominal organ disease. Conservative management is safe but in the “unwell” patient, other options such as: radiological drainage, laparoscopic washout and drainage, and surgical resection can be life-saving. Careful selection of patients using current stratification tools will help with management. All patients with intra-abdominal abscesses require follow-up and possibly further investigations. This article discusses current evidence and controversies underlying today’s management of diverticulitis, diverticular abscess and other intra-abdominal abscesses.

Keywords CT imaging; diverticular disease; diverticulitis; Hartmann’s procedure; Hinchey; intra-abdominal abscess; laparoscopic surgery; lavage; pelvic abscess; radiological drainage

Introduction

Diverticular disease is common in the Western world and the population prevalence of diverticulosis is up to 25% by 60 years of age.¹ In most people, the condition remains asymptomatic but up to quarter of patients develop diverticulitis of which 5% develop complications such as perforation, obstruction, haemorrhage, fistulae or abscesses. In the West, left-side diverticulosis is more common than right-side cases. In contrast, diverticulosis rates are lower in Asia, though there is a higher incidence of right-side diverticulosis, albeit, left-sided cases are still the more common of the two.¹

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The cost of the management of diverticulosis remains high. In the United States, acute diverticulitis is ranked as the third most common in-patient gastrointestinal diagnosis and management of the condition cost \$2 billion annually. In Europe, for non-complicated cases, the cost of treatment varies between €547.05 and €1671.75 and this is dependent on whether patients are managed in out-patients (OPD) or in hospital, respectively. Additionally, in the more cost effectively managed patients in OPD, they show better physical and mental health as measured by the 12-item Short Form Questionnaire.²

Pathophysiology

Diverticulosis is thought to occur as a result of weak colonic wall, high intraluminal pressure or slow colonic transit time caused by colonic structural abnormality, dysmotility and/or fibre deficiency.¹ Diverticulitis is inflammation of colon affected by diverticulosis and may be the result of luminal obstruction of a diverticulum by a faecolith. The obstruction causes stagnation which results in bacterial overgrowth. The overgrowth of bacteria stimulates an inflammatory response. The consequential oedema may restrict venous flow and then arterial flow, causing ischaemia and finally perforation. Localized abscess formation or free peritoneal pus are possible outcomes and their management is dependent on its presentation and classification.

Presentation, investigation and complications of diverticulitis

Patients with diverticulitis often present acutely with left iliac fossa pain and, not unusually, a change in bowel habit to either constipation or diarrhoea. Rectal bleeding is not uncommon and constitutional symptoms such as pyrexia, nausea, vomiting and anorexia may be present. Outpatient presentations follow a similar clinical picture but with milder symptoms. Usual initial investigations include a full history and examination, followed by blood tests to prove the presence of inflammation - leucocytosis, elevated C-reactive protein (CRP). In cases of suspected sepsis, additional measure of serum lactate, renal function, and liver function are useful tests. There was suggestion that first value of CRP could predict the further disease progression, but two recent studies from the same centre have shown that the initial CRP trend and a low CRP in the first 48 hours are not reliable in predicting the outcome.³ The results should be taken in context of the patients’ clinical picture, longer term CRP trend and radiological imaging. Radiological modalities that may be useful include ultrasonography (USS) and water-soluble contrast studies, but the gold standard investigation is the computed tomography (CT).

Recurrence rate of diverticulitis varies between 13% and 47%, with less than 4% of patients having more than one recurrence.⁴ The definition of recurrence is based on complete resolution of the initial episode with the patient remaining asymptomatic for 12 weeks.⁴ The review conducted by Buchs et al. also noted that acute perforation is more common in first presentations, whilst fistula formation is more common in patients’ with recurrent presentations.⁴

Classification of acute diverticulitis

The Hinchey classification of diverticulitis is the most common classification to standardize the definition of acute diverticulitis and to stratify treatment strategies.⁵ Since then, numerous revision and modifications of the classification system has occurred throughout the years. With the advent of CT guided drainage along with laparoscopy, the modified Hinchey classification was then redefined radiologically and operatively.^{6,7} These two classifications are currently the widely accepted system (Table 1). More recently, a drive to further classify CT findings to different stages in order to simplify previous CT classification system and to aid decision making was proposed by Sartelli et al.⁸ (Table 2). The aim of the new proposed system was streamline the treatment and management of acute diverticulitis.

Causes of abscesses and clinical presentation

Intra-abdominal abscesses can be a consequence of perforated diverticulitis. Other causes include traumatic or infective perforation of any other intra-abdominal hollow viscus (including gall bladder, and appendix), infected necrotic pancreatitis, post-operative anastomotic leak, after any other intra-abdominal operations, neoplasia and gynaecological infections.

Patients usually present with a 'swinging' pyrexia, diarrhoea, abdominal pain along with constitutional symptoms. Leucocytosis, elevated CRP, thrombocytosis and raised levels of acute phase proteins are common. All intra-abdominal abscesses can initially be treated similarly regardless the primary cause but further investigation is required to identify the source.

Management after initial assessments

The natural history of diverticulitis is now well described^{4,8} and CT is a frequently used tool to guide diagnosis, and stratify

Modified Hinchey Classification for Diverticulitis (adapted from Wasvary et al. and Kaiser et al.)

Score	Modified Hinchey classification ⁹	Corresponding CT findings ¹⁰
0	Mild clinical diverticulitis	Diverticuli ± thickened colonic wall
Ia	Localized pericolic inflammation or plegmon	Thickened colonic wall with pericolic soft tissue changes
Ib	Pericolic or colonic mesentery abscess	Ia with localized abscess around colon or within colonic mesentery
II	Pelvic, distant intra-abdominal or retroperitoneal abscess	Ia changes and distant abscess
III	Generalized purulent peritonitis	Free intraperitoneal gas with localized or free fluid ± peritoneal wall thickening
IV	Generalized faecal peritonitis	III findings but with suggestion of free intraperitoneal faecal matter

Table 1

Four stages of complicated diverticulitis (adapted from Sartelli et al.)

Stage	Corresponding CT findings ¹¹
1A	Pericolic air bubbles or little pericolic fluid without abscess
1B	Abscess ≤4 cm
2A	Abscess >4 cm
2B	Distant air (>5 cm from inflamed bowel segment)
3	Diffuse fluid without distant free air (no hole in colon)
4	Diffuse fluid with distant free air (persistent hole in colon)

Table 2

treatment as described earlier. Hence, after initial clinical assessment, resuscitation and investigations, conducting a double contrast CT of the abdomen and pelvis will help with decision making according to the modified Hinchey classification and Sartelli CT classification. Broadly, management can be divided into two separate categories: the 'well' and the 'unwell' patient based on whether they have uncomplicated or complicated diverticulitis (Figure 1). The management of other intra-abdominal abscesses can also follow the same algorithm of the two separate categories.

Management and treatment in emergency presentation

The 'well' patient

These patients usually present with localized peritonism and are systemically well. In diverticulitis, the CT findings usually show a Hinchey 0 or Ia diverticulitis, and is coined with the term simple diverticulitis. As the recurrence rate and risk of developing complicated diverticulitis is low, there is an argument to treat simple diverticulitis conservatively. Patients with a CRP >240 mg/L, smokers, renal failure, organ transplant, on non-steroidal anti-inflammatory drugs, and steroids should be managed with caution as they are at higher risk of developing complications.⁴

The classical approach to managing acute diverticulitis has always been the prescriptive use of antibiotics and analgesia. However, a recent meta-analysis showed that withholding antibiotics does not increase the risk of requiring emergency surgery, developing early complications (abscesses and perforation), late complications (strictures), or recurrences.⁹ However, the meta-analysis is limited as it is performed on only three RCTs and, therefore, caution is required in interpreting the results. Recent studies showed that the 'well' patient can be managed cost effectively and successfully as an OPD patient with only 2.6% requiring readmission but their management requires the provision of clear instructions on fluid and food intake along with follow-up on discharge.²

The 'unwell' patient

Any patient with symptoms, signs and investigative findings consistent with sepsis will require antibiotics as the primary line

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