Inflamed solitary caecal diverticulum – it is not appendicitis, what should I do?

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ABSTRACT

We describe three cases that presented with symptoms suggestive of appendicitis but were found at operation to have an inflamed solitary caecal diverticulum. All were treated successfully with diverticulectomy or inversion of the diverticulum. We wish to highlight this diagnosis and its surgical management so that informed decisions can be made if this is first encountered in the operating theatre.

KEYWORDS

Caecal diverticulum – Inflamed – Diverticulectomy – Inversion – Appendicitis

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An inflamed solitary caecal diverticulum is a rare diagnosis that presents in a manner similar to appendicitis. The majority of cases are identified intra-operatively. We describe three cases that presented to a district general hospital over an 18-month period to highlight this diagnosis and its surgical treatment, so that trainees can make informed decisions if this is first encountered in the operating theatre.

Case reports

Case 1

A 41-year-old woman presented with a 2-day history of worsening abdominal pain. This began as a vague central pain which localised to the right iliac fossa (RIF). There was associated nausea but no other gastrointestinal (GI) or genitourinary (GU) symptoms. Past history included a previous appendicectomy and hysterectomy with bilateral oophorectomy.

On examination, she was afebrile. She was tender in her RIF with guarding. There was no rebound tenderness or masses palpable. Urine analysis was unremarkable and blood results showed a mild leukocytosis with a raised C-reactive protein (CRP). She was initially treated expectantly; however, her pain worsened and she proceeded to exploratory laparotomy through a Rutherford-Morrison incision. An indurated area on the posterior aspect of the caecum was identified. The ascending colon was mobilised and a caecotomy performed. The ostium of a solitary diverticulum was identified with normal surrounding mucosa (Fig. 1). This

was excised and the caecum closed primarily in two layers. She made an uncomplicated recovery and was discharged on the sixth postoperative day. Histology confirmed a perforated caecal diverticulum with no muscular layer. There was no malignancy. Barium enema one month later showed no evidence of diverticular disease.

Case 2

A 21-year-old female presented with a 2-day history of colicky abdominal pain which localised to the RIF. There

Figure 1 Diverticulectomy specimen showing central ostium with normal surrounding mucosa, differentiating a diverticulum from a carcinoma.

were no GI or GU symptoms. She had a past history of ovarian cysts. On examination, she was afebrile with focal RIF tenderness. She had a mild leukocytosis with raised CRP. She proceeded to laparotomy through a Lanz incision. The appendix was grossly normal; however, there was an inflamed anterior caecal diverticulum in close proximity to the ileo-caecal valve. A diverticulectomy with two layer closure and an appendectomy were performed. She had no postoperative complications and was discharged on the second postoperative day. Histology confirmed all layers of the caecal wall to be present in the diverticulum with full-thickness ulceration and perforation.

Case 3

A 44-year-old man presented with a sudden onset of sharp pain in his RIF. There were no GI or GU symptoms. On examination, he was afebrile. He had marked RIF tenderness with guarding and rebound. He proceeded to laparotomy through a Lanz incision, where a solitary caecal diverticulum with abscess formation was identified. The abscess was drained and the diverticulum inverted and buried using a purse-string suture. The appendix was excised. He made an uncomplicated recovery and was discharged on the fifth postoperative day.

Discussion

Caecal diverticulae were first described by Potier in 1912 and around 1000 cases have since been reported in the literature.¹ It has an incidence of approximately 1:50 to 1:300 that of appendicitis.² In a review of 881 cases, Sardi *et al.*³ found that 3.6% of cases of colonic diverticulae involved the caecum. The average age was 45.6 years with a 3:2 male to female ratio. It is more common in Asian populations.

Caecal diverticulae can be classified into two groups – true or congenital and false or acquired.⁴ The true diverticulae are believed to arise from a transient out-pouching of the caecum at 6 weeks' gestation and contain all layers of the colonic wall. The false diverticulae are similar in nature to the more common sigmoid diverticulae and contain no muscular layer.

Solitary caecal diverticulae present in similar ways to other diverticulae, with inflammation, perforation or bleeding. In the majority (85%) of cases, as in ours, it presents in a manner similar to appendicitis with right iliac fossa pain and occasional nausea and vomiting.³ There is usually low-grade pyrexia with right iliac fossa tenderness. Cutajar⁵ suggested clinical features which could help differentiate caecal diverticulitis from appendicitis. There is a relatively long history of abdominal pain with lack of toxicity. Tenderness is not as marked and only elicited on deep palpation, and vomiting is less frequent.

Chou *et al.*⁶ proved the accuracy of ultrasound in diagnosing caecal diverticulitis. In a prospective study of 934

cases with indeterminate right lower abdominal pain, ultrasound had a sensitivity of 91.3% and a specificity of 99.5% in differentiating right-sided diverticulitis from appendicitis. Oudenhoven *et al.*⁷ have also shown that CT scanning can improve the pre-operative diagnosis. Despite these potential diagnostic modalities, the majority of cases of solitary caecal diverticulitis are diagnosed during surgery for presumed appendicitis.

A senior house officer in a general surgical attachment performs a median of eight appendectomies in a 6-month attachment.⁸ Given the introduction of the New Deal and European Working Time Directive, the operative experience of trainees may further decrease. These cases presented to, and were managed by, the authors (DC, RRM) during their basic surgical attachment in a district general hospital, an unusual finding given the rarity of the condition. The majority of trainees will not encounter this diagnosis during their basic training, but need to be aware of the surgical treatment options.

The surgical treatment of caecal diverticulitis has been controversial, with studies recommending options ranging from conservative management with antibiotics alone to aggressive resection.^{1,2,9,10} Given the low incidence and difficulties with diagnosis, there have been no randomised trials comparing conservative with aggressive treatment. Most studies are retrospective note reviews comparing outcomes in those treated with antibiotics alone to diverticulectomy or hemicolectomy. In these studies, patients with more severe disease tended to be treated more aggressively, leading to a selection bias towards conservatively treated patients. Harada and Whelan⁹ found in a review of 90 cases that those treated with appendectomy and antibiotics alone had a more favourable outcome compared to those treated with bowel resection. Chiu *et al.*¹ found similar results in 30 patients treated with antibiotics only. There were no complications and no patients had recurrent pain. Fang *et al.*,² however, advocated aggressive resection, with less than 40% of those treated conservatively in their study having a successful outcome. These studies were from mainly Asian populations. Lane *et al.*¹⁰ in a study of 49 patients with 78% of non-Asian descent, found that 40% of those treated with diverticulectomy or antibiotics alone required subsequent hemicolectomy due to an on-going inflammatory process. In a US population, they recommended diverticulectomy in cases of an inflamed solitary diverticulum.

A diagnostic laparoscopy was not performed in our cases. A recent Cochrane review¹¹ recommended that laparoscopy should be performed in all cases of suspected appendicitis, with young women being most likely to benefit. This approach is likely to reduce further the operative experience of basic trainees. The diagnosis of an inflamed solitary caecal diverticulum would have been obvious on

laparoscopy in our cases with anterior diverticulae; however, the posterior diverticulum may have been overlooked. The caecum appeared normal on inspection with a palpable indurated area posteriorly leading to the diagnosis. This may not have been identified by laparoscopy alone, with laparoscopic mobilisation of the caecum being potentially difficult even in experienced hands. If an inflamed caecal diverticulum is identified at laparoscopy, this can be managed laparoscopically if the operating surgeon has the required expertise, with even complicated diverticulitis being managed laparoscopically in experienced centres.¹² If not, the surgeon can simply treat with antibiotics alone or convert to an open procedure.

Our cases, treated with local resection or inversion of the diverticulum, had no complications and were symptom-free at review. Local treatments are satisfactory and safe in the majority of cases with few complications. The trainee surgeon, if faced with this diagnosis at operation, should discuss the findings with senior staff. In the absence of carcinoma,⁴ extensive inflammation or diverticular disease,⁵ simple resection or inversion with appendicectomy is adequate.

Conclusions

An inflamed solitary caecal diverticulum is a rare diagnosis which is likely to be diagnosed at laparotomy for presumed appendicitis. Routine appendicectomy with postoperative antibiotics alone is a treatment option but risks the possibility of recurrent symptoms. Local resection or inversion of the diverticulum is the treatment of choice.

Right hemicolectomy may be performed in selected cases, particularly if carcinoma cannot be completely excluded.

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