Perforated cecal diverticulitis – A review of an unexpected diagnosis

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Perforated cecal diverticulitis – A review of an unexpected diagnosis

Wei How Lim, Hanumant Chouhan, Devinder Raju, and Rajeev Kapoor

Abstract

Introduction Cecal diverticulitis is a cause for right iliac fossa pain that is not usually considered by surgical trainee due to a clinical presentation on both history and physical examination that mimics appendicitis. This presents a clinical challenge, with a right iliac fossa mass often being the first finding in the operating theatre. Methods A retrospective clinical study of patients who presented to the Lyell McEwin Hospital in South Australia from January 2000 to December 2009 with the diagnosis of diverticulitis was performed. All relevant case notes, blood results and pathological reports have been included in the review. Results Four Caucasian patients with perforated cecal diverticulitis were identified. Three patients underwent surgery for suspected appendicitis and one patient was investigated for malena. Each patient’s postoperative recovery course was uneventful. A literature review of the pathology was presented to discuss its epidemiology and management dilemma. Conclusion While cecal diverticulitis has a low incidence among the Western population, its management is similar to left sided diverticulitis, with conservative management and diverticulectomy shown to be effective. In the event of either perforation or hemorrhage, surgical resection is indicated

KEYWORDS: Cecal diseases, colonic diseases, diverticulitis, intestinal perforation, colectomy
Introduction

Acute appendicitis is the most common cause of right iliac fossa pain with a peak incidence between the ages of 10 and 30 years [1]. Right lower quadrant tenderness upon palpation is often the only finding on examination. Because abdominal pain is a common presenting symptom in any health care institution, the inclusion of cecal diverticulitis under the differential diagnosis is particularly relevant due to a similar presentation to that of appendicitis, making it difficult to differentiate clinically. In this study, we reviewed our experience of cecal diverticulitis with a retrospective analysis of all patients who presented to our surgical unit with a diagnosis of diverticulitis from January 2000 to December 2009. The clinical manifestations, pathology and management options of this disease were further discussed and reviewed.

Methods

From January 2000 to December 2009, all patients who presented to the surgical unit of the Lyell McEwin Hospital with the diagnosis of diverticulitis were retrospectively analyzed. Patients with left sided diverticulitis and other right sided diverticulitis (e.g. hepatic flexure diverticulitis) were excluded from the study. All the relevant case notes, blood results, imaging requests and pathological reports were included in the review for patients identified with a diagnosis of cecal diverticulitis, which was confirmed by histopathological examination.

Results

Of all patients analyzed during the specified time period, four patients with cecal diverticulitis were identified from our records [See Table 1]. All four patients were of Caucasian descent and had a mean age of 45 years. The first 2 patients did not warrant any imaging assistance due to the strong clinical diagnosis of appendicitis, and both underwent a routine laparoscopic appendisectomy to which a mass
was visualized [See Figure 1]. One patient had a palpable mass on the right iliac fossa and warranted the assistance of radiological intervention [See Figure 2]. Another patient was hemodynamically unstable during admission and was investigated for ongoing malena, with an unremarkable endoscopy finding and a sub-optimal colonoscopy procedure. The first three patients underwent a right hemicolecystectomy due to the unexpected finding of a right iliac fossa mass with associated complications; the right hemicolecystectomy was performed in the last patient as the CT angiogram suggested the source of bleeding. All resected specimens were sent for pathological analysis, with macroscopic examination confirming a perforated diverticulum in the cecum [See Figure 3]. Microscopic examination showed evidence of interstitial hemorrhage in the surrounding cecal adventitia with sheets of neutrophils. There was no evidence of malignancy in all specimens.

Discussion

The incidence of cecal diverticulum in the Australia is not known. While the typical patient is of Asian descent presenting with a finding of an inflamed cecal diverticulum [2-4], our cases illustrated the atypical patient of Caucasian descent who presented with findings of perforated inflamed diverticulum disguised as a mass. A male predominance have been noted in this disease, with the average age of presentation being in the fourth decade of life [3,4]. From our review a female predominance was noted with 2 patients both aged 17 and 88 years respectively. A correct pre-operatively diagnosis was not successful in these patients due to a low index of suspicion for cecal diverticulitis from its relatively uncommon presentation in the Western population with no epidemiological data to suggest its prevalence; however there have been an increase in reports of such pathology warranting further consideration for clinicians when faced with a presentation of right iliac fossa pain. A Pubmed search of the words “cecal diverticulum” and “cecal diverticulitis” showed that
since the last 5 years there have been 10 published cases in the United Kingdom [5-10], 5 cases in Spain [11], 4 cases in Turkey [12], 2 cases in Greece [13] and 1 case each in the Netherlands [14] and Brazil [15]. The majority of all reported subjects were Caucasians between the ages of 12-77, suggesting perhaps the prevalence of cecal diverticulum in Western population may not be as uncommon as previously reported. It is quite possible this pathology may have also been underreported and a recent surge in published cases signifies the importance of cecal diverticulum as a cause of abdominal pain.

While the etiology of cecal diverticulum is somewhat unclear, classifying it as either true or false allows a better understanding of its origin. A true diverticulum is usual solitary - containing all layers of the intestinal wall and is believed to be congenital. A false diverticulum on the other hand is usually multiple – it consists of herniation of mucosa and submucosa layers through vulnerable points of the colonic wall and is believed to be acquired [7,8,12] as in left sided diverticular diseases which has an increase prevalence in the elderly. Right-sided diverticula have been noted to occur more frequently in younger patients, predominantly in male individuals [3,9,11,12].

The majority of patients who have cecal diverticulitis are almost always diagnosed and managed as acute appendicitis, and since the latter rarely involves a radiological assessment, diagnosis of cecal diverticulitis represents a clinical challenge. Arriving at a correct pre-operative diagnosis is often assisted if the patient had previously undergone an appendectomy [5,8]. It has also been suggested that there are 3 classical features that could help differentiate cecal diverticulitis from appendicitis, namely a long history of abdominal pain, lack of toxicity, and infrequency of vomiting [16]. This was further supported by a 6 year retrospective review of 450 patients in Korea which noted a lack of
prodromal symptoms such as nausea and vomiting, tenderness at a point lateral to McBurney's point, and absent or mild leukocytosis were suggestive of right sided diverticulitis [17]. A similar observation was noted from another review in Korea of 100 patients from 2005 to 2006 with the assistance of radiological investigations [18], signifying the importance of such distinction in informing the clinical judgment of the surgeon in uncovering the correct diagnosis.

Imaging modalities such as ultrasound has been shown to be effective in demonstrating the mural, serosal, and mesenteric extent of the disease. A review of 934 patients who presented with abdominal pain demonstrated an overall accuracy of 99.5% in the diagnosis of cecal diverticulitis [19]. This may prove as a challenge, especially in cases of a small diverticulum as well as the requirement for a skilled sonographer for accurate detection of this uncommon presentation which may limit the use of ultrasound in this setting. A computed tomography scan of the abdomen has also been shown to be accurate in arriving at a diagnosis [20] although its role in young adults is debatable, especially when there is a strong clinical suspicion of appendicitis. Nevertheless, the role of radiological interventions has been shown to be useful and could be used in patients pending the surgeon’s overall impression.

There are no guidelines in place supporting a treatment plan for cecal diverticulitis. According to available reported case series, the management is no different compared to left-sided diverticulitis, ranging from conservative antibiotic treatment to surgical resection, including diverticulectomy and hemicolectomy [5-12].

Conservative therapy has been suggested as the preferred treatment strategy from an observation of 30 patients who presented with cecal diverticulitis and were subsequently treated with intravenous
antibiotics [21]. This was further supported by a retrospective review in China of 113 patients over 10 years from 1994 to 2004 for the management of right-sided diverticulitis, where it was found that adequate antibiotic therapy was a safe and effective form of treatment [22]. While the 2 reviews reflected upon the Asian population, available cases involving Caucasian patients were noted to require further treatment despite adequate antibiotic administration due to ongoing inflammation, as noted in 39 patients in the USA [23]. In another review of 8 patients over a 25 year period, a diverticulectomy has also been shown to be safe and effective [24]. However this option may be limited if the diverticulum is not clearly visible, complicated by the presence of extensive inflammation or perforation and finally, if a neoplasia cannot be confidently excluded from the differential diagnosis.

A colonic resection is highly recommended in complicated right-sided cases as noted from a 10 year observation study on 593 patients. It was observed that a hemicolectomy is the definitive treatment of choice as it prevents the recurrence of symptoms or if significant complications like bleeding or perforation were evident [25]. While a mortality rate of less than 2% have been reported [4,26], a review of 39 patients in USA [23] and 18 patients in Hong Kong [27] who received immediate resection of the right colon reported no mortality. In another review while there were 2 reported deaths out of 34 patients who had undergone similar procedures, both patients had associated underlying diseases that may have made ultimately affected their recovery [28]. Right hemicolectomy was warranted in all 3 patients of our analysis as the inflammatory mass had evidence of adhesions and perforation, with free fluid around. A diverticulectomy was not possible due to the inflammatory phlegmon with localized perforation.
Conclusion

The aim of this paper is to illustrate cecal diverticulitis as an uncommon cause of right iliac fossa pain in the Australian population, widening the differential diagnosis for acute appendicitis among junior surgical trainees. Diagnosing and differentiating cecal diverticulitis from appendicitis is important as the management differs between the two conditions as illustrated above. Therefore a high level of suspicion is advisable for both surgeons and radiologist as the use of ultrasound may assist in peri-operative diagnosis despite an unremarkable clinical presentation; this is especially so if the condition is first encountered intra-operatively as it was for the first two cases presented herein. Colonic resection remains the definitive treatment option for complicated cecal diverticulitis. A review of epidemiologic and management studies assessing cecal diverticulum in Caucasian populations would provide a baseline understanding as well as a comparative analysis with the Asians populations.

Acknowledgement

We are grateful to Dr Keith Bouskill who supplied the pathology images as well as his interpretations of the pathological specimens.

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<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>Imaging</th>
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<td>Male</td>
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<td>Right hemicolecotomy</td>
<td>Caecal diverticulitis with perforation</td>
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<tr>
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<td>Nil</td>
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<td>Right hemicolecotomy</td>
<td>Caecal diverticulitis with perforation</td>
</tr>
<tr>
<td>3</td>
<td>37</td>
<td>Female</td>
<td>CT abdomen</td>
<td>Appendicular mass</td>
<td>Right iliac fossa mass with multiple adhesions</td>
<td>Right hemicolecotomy</td>
<td>Caecal diverticulitis with adhesions</td>
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<tr>
<td>4</td>
<td>88</td>
<td>Female</td>
<td>CT angiogram</td>
<td>Angiodysplasia of right colon</td>
<td>Normal</td>
<td>Right hemicolecotomy</td>
<td>Caecal diverticulitis with hemorrhage</td>
</tr>
</tbody>
</table>

Table 1 - Four Caucasian individuals identified with a diagnosis of perforated cecal diverticulitis from our records of patients from January 2000 to December 2009.
Figure 1
A laparoscopic view of the cecum revealing a mass adhering to the surrounding adipose tissues, with free fluid around.
Figure 2

A CT scan of the pelvis illustrating a multiloculated large mass measuring 5.1x 5.5 x 7.8cm seen in the RIF with enhancing walls. The centre of the mass is heterogeneously hyperdense, suggesting an appendicular mass.
Upon bisection of the caecum revealed 2 diverticula – one which contained a dense fecolith being acutely inflamed with a perforation at its tip with surrounding inflammation. The other diverticulum appeared normal, with a central ostium noted on the mucosa surface.