Type of the article: Case Report

Title of the article: An unusual presentation of perforated appendix mimicking a liver abscess in an Aboriginal male

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160-character summary of article: A case report of a 26-year-old Aboriginal male in Alice Springs with an unusual presentation of perforated appendix mimicking a liver abscess.

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Abstract

Introduction

A perforated appendix presents as an atypical right-sided subphrenic, subcapsular hypodense collection on the computed tomography (CT) scan, mimicking a subcapsular liver abscess.

Case

A 26-year-old Aboriginal male presented to Alice Springs Hospital with a one-month history of right-sided abdominal pain, as well as weight loss of 16 kg following treatment with three courses of antibiotics for a suspected sexually transmitted infection. Radiological findings on CT revealed a mild right pleural effusion with right lower lobe partial atelectasis and a right-sided subphrenic, subcapsular hypodense collection with an air-fluid level in the right lobe of the liver. A diagnostic laparoscopy showed a suspected perforated appendix, which was later managed by laparoscopic drainage. This was followed by an open interval appendicectomy with abscess drainage. After one further ultrasound-guided drainage and a 6-week course of antibiotics, he was discharged and had a good recovery.

Discussion

This case report aims to highlight the importance of a high grade of clinical suspicion for atypical presentations of perforated appendix, as well as the role of exploratory laparoscopy in managing uncertain diagnoses.

Learning points

1. Atypical presentations of a perforated appendix
2. Differential diagnosis of a subphrenic abscess
3. Challenges for the Aboriginal population predisposing to delayed treatment
Introduction

Perforated appendices, one of the complications of acute appendicitis, may present atypically, leading to misdiagnosis and delayed treatment. Furthermore, findings of radiological modalities, such as with computerised tomography (CT), do not always point to the diagnosis of the abscess. In this case, we report an Aboriginal patient in Northern Territory with a perforated appendix presenting with an atypical right-sided subphrenic, subcapsular hypodense collection on the CT scan, initially imitating a subcapsular liver abscess. Northern Territory has an estimated population of 245,562 persons, where 30% of the population is Aboriginal [1]. The patient lived in a small community of 199 people in Mount Liebig, locally known as Watiyawanu, a region 325 km west of Alice Springs [2]. In view of the limited local medical facilities, he was transferred to Alice Springs hospital by the Royal Flying Doctor Service. A subcapsular liver abscess was diagnosed on an abdominal CT scan and managed by laparoscopic imaging and drainage due to the unavailability of an interventional radiologist at the time. He needed two further interventions by way of an open appendicectomy with abscess drainage and radiological drainage before being discharged.

Case

A 26-year-old Aboriginal male presented to Alice Springs Hospital with a one-month history of right-sided abdominal pain and weight loss of 16 kg. These symptoms occurred following treatment with three courses of antibiotics for a suspected sexually transmitted disease in a community outreach clinic in outback Central Australia. This provisional diagnosis was made given the ongoing abdominal pain and limited investigations available at the outreach health centre. Following treatment, he had unresolved pain, new coughing, and intermittent vomiting. He reported no other significant relevant background medical or surgical history. His vital signs on admission were within normal range. On examination, there was a dull percussion note at the right lung base with decreased air entry. His abdomen was firm, with slight distension and tenderness over the right upper quadrant region and audible bowel sounds.

Table 1. Laboratory investigations upon admission to Alice Springs Hospital.

<table>
<thead>
<tr>
<th>Test result</th>
<th>Reference Range</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium: 123 mmol/L</td>
<td>135-145 mmol/L</td>
<td>Low</td>
</tr>
<tr>
<td>White cell count: 18.9 x 10^9/L</td>
<td>4.0-11.0 x 10^9/L</td>
<td>High</td>
</tr>
<tr>
<td>Bilirubin: 22 umol/L</td>
<td>&lt; 21 umol/L</td>
<td>High</td>
</tr>
<tr>
<td>Alkaline phosphatase: 155 U/L</td>
<td>30-110 U/L</td>
<td>High</td>
</tr>
<tr>
<td>Gamma-glutamyl transpeptidase: 117 U/L</td>
<td>&lt; 61 U/L</td>
<td>High</td>
</tr>
<tr>
<td>Albumin: 32 g/L</td>
<td>39-50 g/L</td>
<td>Low</td>
</tr>
<tr>
<td>Plasma lipase: 485 U/L</td>
<td>23-300 U/L</td>
<td>High</td>
</tr>
</tbody>
</table>

A CT scan of the abdomen with contrast was carried out, showing the presence of a mild right pleural effusion with right lower lobe partial atelectasis. It also showed a right-sided subphrenic, subcapsular hypodense lesion with an air-fluid level in the right lobe of the liver, as shown in Figures 1 and 2. Other than the subcapsular collection (132.7 x 38.7 x 141.3mm), no evidence of hepatobiliary abnormalities, appendicitis, or peri-appendiceal abscess was reported. Due to the unknown origin and unavailability of interventional drainage during this time, a diagnostic laparoscopy was performed, revealing that the collection had most likely resulted from a suspected perforated appendix. The patient was managed with laparoscopic
drainage of the abscess, washout and placement of drain (Figure 3). Further dissection inferiorly towards the caecum was not performed to avoid inadvertent iatrogenic bowel perforation.

Following index laparoscopic drainage, the patient was managed with intravenous antibiotics and drain removal on the fourth post-operative day with minimal output. He declined further medical advice upon drain removal, choosing to take own leave, a culturally respectful practice by Aboriginal Australians to return to their community. He represented almost one month later with fevers and recollection of the abscess on repeat CT. Following this, an open interval appendicectomy with abscess drainage was performed via midline laparotomy. A remnant appendix was found in the right iliac fossa with the caecum intact and no obvious site of perforation. Post-operatively, he required one further ultrasound-guided drainage of an abscess with interventional radiology and a further six-week treatment of intravenous antibiotics under the guidance of the infectious disease team. During his inpatient stay he required regular drain flushes and aspirates into the abscess cavity. The drain was eventually removed in an outpatient setting, once there were minimal aspirates and no further collections on repeat ultrasound imaging. He has since been discharged home and has made a good recovery.

Discussion

Common aetiologies of a subphrenic abscess include amoebic liver abscess, empyema, pylephlebitis, pulmonary collapse, and perforated appendix [3]. A perforated appendix is a potentially fatal complication of appendicitis. If left untreated, it can result in peritonitis, abscess or phlegmon formation and, in some cases, sepsisemia [4]. Urgent surgical intervention is often required and is associated with a higher effective rate and lower relapse rate compared to conservative treatment with antibiotics [5]. Given its variable and sometimes atypical clinical presentations, misdiagnosis is not uncommon and occurs in up to 30% of cases [6]. Common misdiagnosed conditions mimicking appendicitis include; Crohn's disease, urolithiasis, pyelonephritis, ovarian torsion, pelvic inflammatory disease, and ectopic pregnancy [7]. Known risk factors of appendiceal perforation include male sex, advanced age, lower literacy, longer pre-admission period, history of abdominal surgery, immunosuppression, and the presence of atypical presentations (for example, diarrhoea and pain in the epigastric region or right lower quadrant of a longer duration) [6,8]. In this case, the patient was considered at high risk of developing perforation according to the matched risk factors.

This case is deemed unusual for a perforated appendix due to its atypical presentation, the absence of distinctive radiological signs of appendiceal inflammation, and the uncommon location of the collection mimicking a liver abscess. While the migration of pain from the periumbilical region to the right iliac fossa presents only in 50% of cases, common signs and symptoms such as abdominal pain and anorexia present in almost all cases [9]. Other signs, including the psoas sign, rebound tenderness, and low-grade fever less common [9]. This explains why atypical presentations occur in up to 34% of appendicitis cases [10]. Further, appendicitis at the subhepatic region accounts for only 0.08% of all appendicitis cases [11]. Nanjaraj et al. reported a similar case where a 19-year-old female with a perforated subhepatic appendix which was first identified by the presence of a peripherally enhancing subcapsular collection via a CT scan of the abdomen [11]. Similarly, a 45-year-old male with perforated retrocecal appendix reported by Nizamani et al. was also shown to have three subcapsular subhepatic abscesses with peripherally enhancing and centrally non-
enhancing necrosis on a CT scan [12]. The appendiceal origin of the collection in both cases was confirmed by laparoscopy. Also noteworthy is the presence of pleural effusion in this case. A similar one was also reported by Ku et al. regarding a 14-year-old male who developed a pleural effusion as a rare complication of ruptured appendicitis [13].

While there remains no consensus on the definitive treatment for complicated appendicitis with abscess, it is primarily categorised into surgical interventions, with either immediate or interval appendicectomy, or non-surgical intervention with antibiotics followed by percutaneous drainage. A systematic review by Darwazeh et al. of 21 studies including a total of 1943 patients concludes that nonsurgical treatment is associated with 12.4% higher risks of recurrence, 2.9% of higher morbidity and 4.6 days longer hospital stays than an interval appendicectomy [14]. In contrast, another study by Guida et al. reviewed the cases of six ruptured appendixes with abscesses and supports the management of initial antibiotic therapy followed by interval appendicectomy. This approach is typically reserved for generally well patients with contained perforation, due to a lower chance of developing postoperative abdominal abscess, organ damage, and complicated wound infections [15].

Lastly, this case provides some insights into the obstacles Aboriginal Australians encounter which contribute to delayed treatments and unfavourable prognoses. Firstly, Aboriginal Australians may have their own set of cultural beliefs, faiths, and values [16], and may be more reluctant to seek medical attention from mainstream healthcare services [16]. Secondly, within the Northern Territory, there are more than 100 dialects spoken by Aboriginal people and only 2.1% speak only English at home [16]. With interpreters sometimes difficult to obtain, communication barriers between Aboriginal Australians and healthcare workers impose a hardship on trust building, further hampering access to the healthcare system. In this case, the patient’s limited proficiency in English may have contributed to his delayed presentation and suboptimal post-operative care. Lastly, due to poorer access to education in Aboriginal communities and poorer health literacy [16], compliance issues are not uncommon and may affect a patient’s prognosis. All these factors may have played a role in this case.

This case highlights the importance of having a high grade of clinical suspicion for atypical presentations of perforated appendix and how diagnostic laparoscopy plays a role in guiding the management of an uncertain diagnosis.

**Consent Declaration**

Informed consent was obtained from the patient for publication of this case report and accompanying figures.

**Conflicts of Interest**

None declared.

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Authors Contribution

Justin Ng and Martha Hui are the shared primary authors. Dr Shaveen Kanakaratne and Dr Jayantha Senaratne guided and supervised the work.

References


