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Conservative management of perforation of a duodenal diverticulum

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Abstract

Presentation
We present the case of a female patient in her 80's brought to the Casualty Department *in extremis* with a 18 hour history of abdominal pain, vomiting, diarrhoea and fever.

Diagnosis
A diagnosis of a perforated duodenal diverticulum (DD) was made following computed tomography (CT) imaging of the abdomen.

Treatment
The patient was managed conservatively with bowel rest, nasogastric drainage, total parenteral nutrition (TPN) and intravenous antibiotic therapy

Discussion
Perforation of a duodenal diverticulum is an extremely rare event associated with high morbidity and mortality. It is typically managed by surgical intervention, however as our case demonstrates, non-operative management can be successful in appropriate patients.

Introduction

While the duodenum is frequently affected by diverticular disease, episodes of diverticulitis are rare, and perforation secondary to this rarer still. Perforations of DD are associated with high rates of mortality and represent a diagnostic and therapeutic challenge. Historically management of perforated DD has been surgical, however the evidence base for this is small and in the last 50 years non-operative management has gained credence. Here we present a case of DD perforation secondary to diverticulitis, successfully managed conservatively.

Case Report

A female in her 9th decade was brought to the Casualty Department by ambulance with an 18-hour history of diffuse abdominal pain, 12 episodes of bilious vomiting and 4 episodes of loose, watery stool. Onset occurred the previous evening approximately 1 hour following a meal at a restaurant. On admission the patient was acutely unwell with raised inflammatory

markers (white cell count 11.8, C-reactive protein 85) and lactate of 5. Computed tomography (CT) imaging of the abdomen revealed diverticulitis at the junction of the second and third parts of the duodenum with adjacent fat stranding, free air and free fluid indicative of a localised perforation (Figure 1). The decision was made to proceed conservatively and the patient was treated with nasogastric drainage, intravenous fluid therapy, bowel rest, TPN and antibiotics. Serial imaging revealed a reduction in the air fluid collection at 2 weeks post-admission. At follow-up endoscopy 2 months post-discharge the diverticulum appeared healthy and the patient reported no residual symptoms.

Discussion

Diverticular disease affecting the duodenum, first described by Chomel in 1710[1], is the most common site of disease outside the colon. Perforation is a rare but serious complication associated with considerable morbidity and, in some cases, mortality rates of up to 34%.[2, 3] Since first being reported in 1907[4], approximately 200 cases have been described in the literature.[3] DD can be classified as congenital, involving all 3 layers of the bowel wall, and acquired, occurring when the mucosal and submucosal layers prolapse through focal defects in the muscularis propria.[5, 6] Of these the acquired type is more common.[5] The descending duodenum is the most frequently affected site.[3] Duodenal diverticula are asymptomatic in approximately 90% of cases[3, 7] with diverticulitis thought be rare due to high intraluminal flow rate, relatively larger pouch size and a lower bacterial burden in the duodenum.[5] Perforation of DD is most often caused by diverticulitis (62%)[7], although other causes such as duodenal ulceration, foreign body, iatrogenic injury during endoscopy, increased luminal pressure secondary to distal bowel obstruction, abdominal trauma and enterolithiasis have been reported.[3, 5, 7] The signs and symptoms associated with DD are diverse, the most common being abdominal pain.[7] Nausea, vomiting, fever and peritonitis are also commonly associated with perforated DD.[7] Owing to the non-specific nature of the symptoms the differential diagnosis can include: duodenal ulcer, peptic ulcer disease, retrocaecal appendicitis, cholecystitis and pancreatitis.[7, 8] CT is considered the gold standard imaging modality for diagnosing DD perforation and typically demonstrates thickening of the duodenal wall ≥4mm, fat stranding of the mesentery, pneumoperitoneum or pneumoretroperitoneum.[5, 8] Other imaging modalities such as plain films of the abdomen, upper GI series and ultrasonography have been used but are poorly suited to diagnosing perforated DD.[8] Pre-operative diagnosis rates have been historically low, a testament to the complexity of differentiating DD from other aetiologies of the acute abdomen.[7]

Treatment of DD has traditionally consisted of surgery[7] however conservative management, as in our case, has proven effective in appropriate cases.[5] Furthermore a “step-up” approach has been reported in recent times with non-operative management trialled initially followed by escalation to surgical management as necessary.[5] Conservative, or non-operative, management entails strict bowel rest with TPN, proximal decompression with nasogastric

tube where appropriate, intravenous fluids and antibiotic therapy.[8] Surgical treatment options in DD include omental patching, diverticulectomy, Roux-en-Y duodenojejunostomy and even Whipple's procedure.[3, 8] The position of the diverticulum relative to the ampulla of Vater is a critical factor when considering surgical intervention.[3] Adjunctive measures such as introduction of a balloon catheter into the duodenum via the common bile duct, biliary stent placement and cholecystostomy can also be employed to lessen the impact of the biliary system on a perforation.[5]

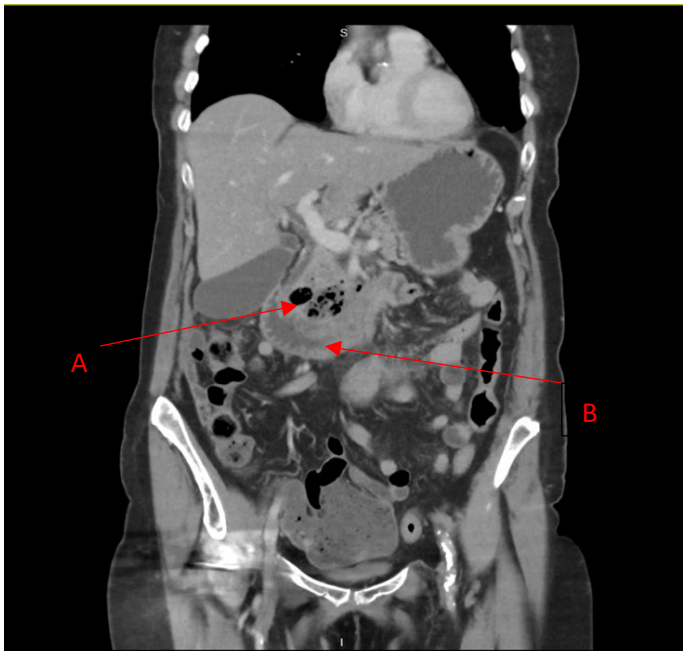

Figure 1: A coronal CT view demonstrating free air (A) and thickening of the bowel wall (B)

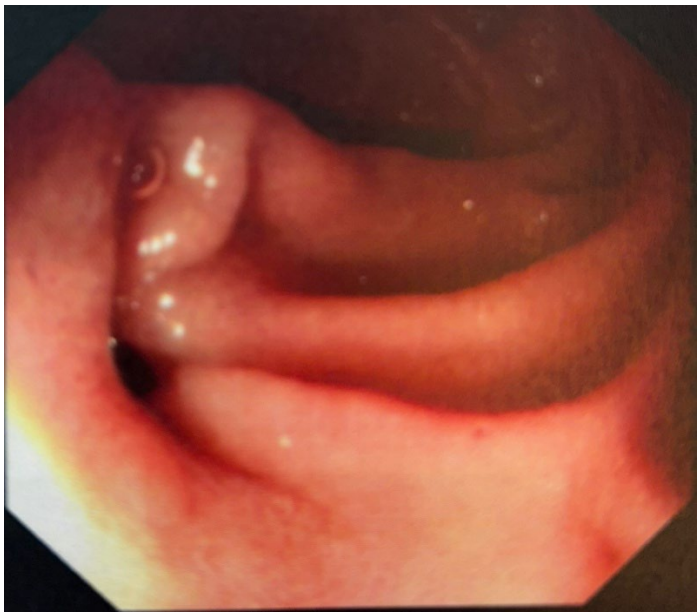

Figure 2: A diverticulum visible at the D1/D2 junction on endoscopy 12 weeks post-discharge

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Declarations of Conflicts of Interest:

None declared.

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