Large bowel obstruction secondary to gallstone impaction at a sigmoid diverticular stricture: the radiological features

Saravanan Munusamy, Kumar Subramanian and Chris Loughran

Department of Neuroradiology, Barts and the London NHS Trust, London, UK

Corresponding address: Saravanan Munusamy, 10 Mere Bank Close, Worsley, Manchester, M28 0AS, UK.
E-mail: msaravanan75@hotmail.com

Date accepted for publication 2 February 2009

Abstract

Intestinal obstruction secondary to displacement of a stone from the gall bladder into the intestinal tract is relatively uncommon. The commonest site of calculus impaction is at the ilio-caecal valve. Occasionally, however, the gall stone may either pass through the valve into the colon or perforate directly into the transverse colon and impact in the distal colon. The extruded calculus is often only faintly calcified and may be difficult to identify on plain radiographs. We describe a case where multislice computed tomography of the abdomen enabled an accurate diagnosis to be made. Prompt surgical treatment was subsequently undertaken. We report the imaging findings with particular emphasis on the importance of computed tomography in establishing the diagnosis.

Keywords

Gallstone; diverticular stricture; large bowel obstruction.

Introduction

Intestinal obstruction secondary to displacement of a stone from the gall bladder into the intestinal tract is relatively uncommon. The commonest site of calculus impaction is at the ilio-cæcal valve. Occasionally, however, the gall stone may either pass through the valve into the colon or perforate directly into the transverse colon and impact in the distal colon. The extruded calculus is often only faintly calcified and may be difficult to identify on plain radiographs.

We describe a case where multislice computed tomography (MSCT) of the abdomen enabled an accurate diagnosis to be made. Prompt surgical treatment was subsequently undertaken. We report the imaging findings with particular emphasis on the importance of computed tomography (CT) in establishing the diagnosis.

Case report

A seventy-five year old female presented with a 4 week history of colicky lower abdominal pain which had become localised to the left iliac fossa. She felt feverish and had vomited once since

This paper is available online at http://www.grandrounds-e-med.com. In the event of a change in the URL address, please use the DOI provided to locate the paper.
the onset of the pain. She denied any blood or mucus per rectum. Her general practitioner had commenced her on oral ciprofloxacin 1 week earlier. She had undergone an appendicectomy 50 years ago. On examination she was tender in the left iliac fossa with minimal guarding but no signs of peritonism. Bowel sounds were present. A rectal examination was unremarkable. Although a plain abdominal radiograph demonstrated gas in the biliary tree, acute diverticulitis was thought a more likely clinical diagnosis (Fig. 1). A dynamic multislice enhanced CT scan of the abdomen and pelvis was performed. (Toshiba Asteion, enhancement with 100 ml of ioversol 300 at 3 ml/s). The scan confirmed gas within the biliary system and a laminated calculus impacted in a markedly thickened loop of the sigmoid colon (Fig. 2). A putative diagnosis of gall stone impaction in a segment of diverticular change was made. A water-soluble contrast enema confirmed complete obstruction at the site of calculus impaction (Fig. 3). The patient subsequently proceeded to laparotomy and underwent a Hartmann’s procedure. The resected
segment of sigmoid colon revealed an impacted gallstone proximal to a diverticular stricture. Recovery was uneventful.

**Discussion**

Gall stone ileus is a condition in which gall bladder calculi erode into the intestinal tract. The fistulous communication so created permits passage of intestinal gas into the biliary system, a characteristic feature sometimes seen on plain radiographs. Usually the calculi erode into the adjacent duodenum and migrate distally. The stones then impact – usually at the ileo-caecal valve – and cause a distal small bowel obstruction. The stone itself is sometimes demonstrated in one of the terminal ileal loops on plain abdominal films. A combination of these findings is diagnostic of a gallstone ileus\(^1,2\).

Other sites for impaction include the duodeno-jejunal flexure or at any small bowel stricture\(^3\). If large enough, they may impact proximally and cause duodenal obstruction. (Bouveret’s syndrome). However, it is well recognised that calculi may rarely pass directly into the transverse colon. The larger calibre of the colon permits passage of the stone into the distal large bowel. The calculus is liable to impact if there is any distal colonic stricture. In this case the impacted endoluminal gallstone occurred at a diverticular stricture and incited an acute diverticulitis.

The primary CT findings in uncomplicated diverticular change include thickening of the wall of the involved segment of colon with visualisation of colonic diverticula\(^4,5\). In cases where there is a complicating acute inflammatory change, there may be more marked bowel wall thickening, stranding of the mesenteric fat and, in the most severe cases, peri-colic abscess formation. Other visualised complications include free perforation, colo-vesical fistula and ureteric obstruction\(^4,5\). Pericolonic inflammation and segment involvement greater than 10 cm are very suggestive of acute diverticulitis\(^6\).

The ability to image pericolonic abnormalities makes CT arguably a better modality to evaluate diverticulitis than barium enema\(^7,8\). The differential diagnosis of colonic wall thickening and

![Fig. 2. CT scan of the lower pelvis. The laminated calculus can be seen clearly in the thickened loop of the sigmoid colon.](image.png)
pericolonic soft tissue stranding include inflammatory bowel disease, pseudo membranous colitis and other infectious colitides. Other rarer causes include eosinophilic enteritis, lymphocytic colitis and lupus colitis\cite{9}.

**Teaching points**

MSCT enabled precise identification of the location of the calculus in the intestinal tract. Although a standard open laparotomy was pursued in this instance, the knowledge that the obstructing stone was in the distal colon could have led to consideration of calculus fragmentation via an endoscope and a lithotripter device – thus saving an open laparotomy.

A recent review of the use of CT scanning in the acute abdomen suggested that if used more liberally there may be benefits, including a shorter hospital stay and reduced patient morbidity and mortality\cite{10}. This case reflects that opinion and highlights the potential for MSCT to establish an accurate diagnosis even in unusual conditions such as that described.

**References**