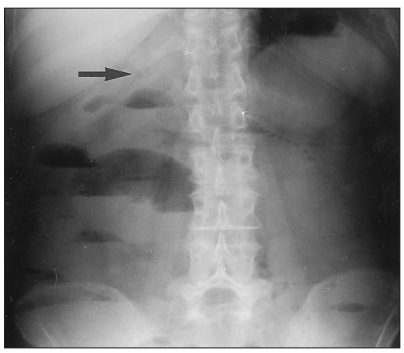
Gall-stone ileus: imaging features

Iain D Lyburn, Alison C Harris, William C Torreggiani, Dimitrios C Papadouris, Rona E Cheifetz, Charles V Zwirewich

INTRODUCTION

Gall-stone ileus is a well-known, but uncommon cause of intestinal obstruction. Preceding symptoms of biliary disease are absent in most cases and the presentation is often vague and non-specific (Reisner and Cohen, 1994). Plain abdominal X-ray is often inconclusive, but may show classical signs (Rigler et al, 1941). Ultrasound and computed tomography (CT) are useful in making the diagnosis (Summerton et al, 1995; Swift and Spencer, 1998). This paper presents abdominal X-ray, sonographic and CT findings in a patient with surgically proven gall-stone ileus.

Figure 1. Abdominal X-ray showing multiple gas fluid levels in dilated small bowel compatible with small bowel obstruction and pneumobilia (arrow).



DISCUSSION

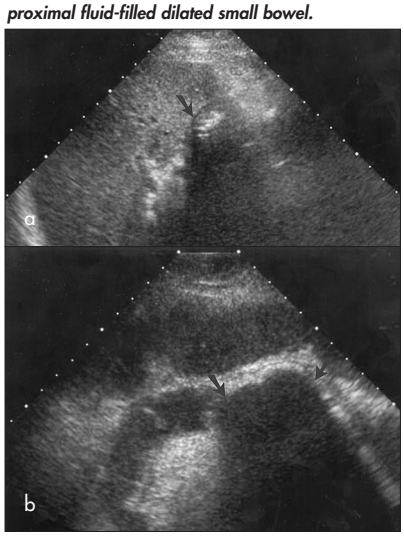
Gall-stone ileus accounts for a quarter of all cases of non-strangulated small bowel obstructions in patients over 65 years of age (Moss et al, 1987). The high mortality rate of 15–18% is the result of delay in diagnosis and treatment, in addition to coexisting medical illness (Clavien et al, 1990). Clinical manifestations are rarely specific and the correct diagnosis is made in less than 50% of patients preoperatively (Reisner and Cohen, 1994).

The calculus usually enters the bowel directly from the gall bladder to the duodenum; gastrocholecystic fistula as in the case presented is unusual. A variable length of bowel is traversed before stone impaction, which finally occurs as sedimentation of intestinal contents gradually enlarges the stone and the calibre of the small bowel decreases (van Hillo et al, 1987). Impaction most frequently occurs in the distal ileum; other sites include the mid and proximal ileum, jejunum, colon, stomach and duodenum (Bouveret's syndrome) (Bouveret, 1896; Reisner and Cohen, 1994; Foster, 1997).

The classic radiographic triad of Rigler et al (1941) – small bowel obstruction, ectopic gall-stone and pneumobilia – are seen on plain abdominal radiographs only in one third of cases (Reisner and Cohen, 1994). Sonography may show pneumobilia, gas in the gall bladder bed and the impacted stone in dilated bowel (Summerton et al, 1995).

CT is widely used in the assessment of the acute abdomen and may be helpful in the investigation of cases of small bowel obstruction. Findings in gall-stone ileus on CT include gas within a contracted gall bladder, ductal pneumobilia, free perihepatic fluid, inflammation of the right upper quadrant intraperitoneal fat and dilated bowel to an intraluminal obstructing

Figure 2. a. Transverse oblique sonogram of the gall bladder fossa showing echogenic foci (arrow) with ring-down artefact suggestive of gas within the gall bladder. b. Transverse oblique sonogram of the left paraumbilical region demonstrating a densely shadowing echogenic mass (arrows) with proximal fluid-filled dilated small bowel.



CASE REPORT

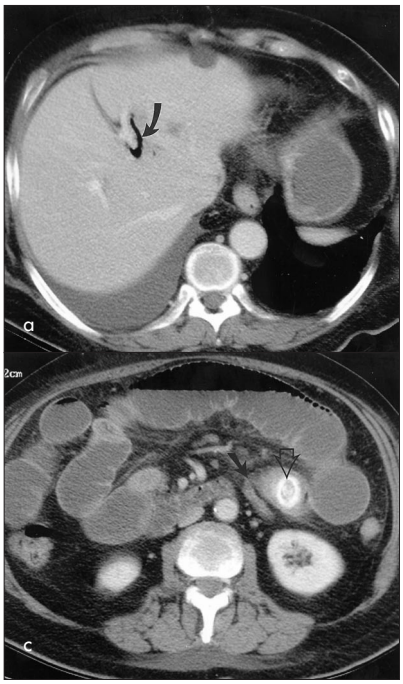
A 71-year-old woman presented to hospital with a 10-day history of intermittent abdominal pain and constipation. Over the previous 2 days she had had two episodes of bilious vomiting. She recalled four episodes of right upper quadrant pain that had settled without medical intervention in the preceding 5 years. She had no relevant past medical history and no previous abdominal surgery. On examination the patient was not in distress. She had a normal blood pressure, pulse and temperature. There was generalized abdominal distension, with guarding over the lower pelvis. Bowel sounds were present in the left upper quadrant. Serum liver function tests were normal and there was a mildly elevated white cell count of 11 900/μl (normal range 4000–11 000/μl).

An abdominal radiograph showed small bowel obstruction with pneumobilia (*Figure 1*), in keeping with gall-stone ileus. Sonography demonstrated echogenic foci, with ring-down artefact in the gall bladder fossa (*Figure 2a*). In the left paraumbilical region a 3.5 cm, ovoid, densely shadowing echogenic mass was visualized within dilated small bowel (*Figure 2b*).

Computed tomography examination correlated with the sonographic findings, identifying gas in the gall bladder, ductal pneumobilia and a high attenuation discrete mass in the mid ileum with proximal bowel dilatation and collapse of the bowel distally (*Figure 3a–c*). Surgery confirmed the presence of an impacted gall-stone in the mid ileum, with extensive local oedema and mesenteric stranding. Primary closure of a prepyloric gastrocholecystic fistula, gall bladder resection and enterotomy with stone extraction were performed.

Dr Iain D Lyburn is Clinical Fellow, **Dr Alison C Harris** is Clinical Fellow, **Dr William C Torreggiani** is Clinical Fellow, **Dr Dimitrios C Papadouris** is Resident in the Department of Radiology, **Dr Rona E Cheifetz** is Assistant Professor in the Department of Surgery and **Dr Charles V Zwirewich** is Assistant Professor in the Department of Radiology, Vancouver General Hospital and University of British Columbia, Vancouver, BC V5Z 1M9, Canada

Correspondence to: Dr ID Lyburn, Department of Radiology, Frenchay Hospital, Bristol BS16 1LE



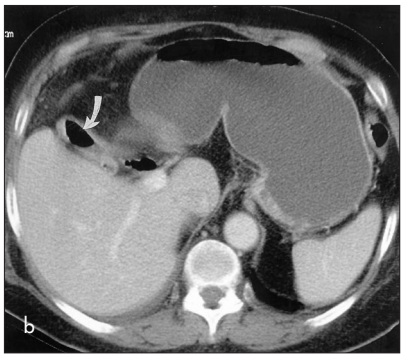


Figure 3. a. Axial computed tomography (CT) scan through the mid liver showing intrahepatic ductal pneumobilia (arrow). There is a right pleural effusion and simple cyst on the anterior margin of the left lobe of the liver. b. Axial CT scan through the gall bladder fossa demonstrating gas within the gall bladder (arrow) and dilated fluid-filled stomach. c. Axial CT scan through the midabdomen demonstrating calcified gall-stone (open arrow) with dilated fluid-filled small bowel loops proximally and collapsed bowel distally (closed arrow).

calculus. Not all the abnormalities may be present in every case and the features of intraluminal calculi are variable ranging from classical calcification to soft tissue density mimicking a primary intraluminal tumour (Swift and Spencer, 1998).

Gall-stone ileus often has a very non-specific presentation. In elderly patients with small bowel obstruction CT may accurately diagnose the condition and is an important adjunct to clinical assessment and other imaging modalities (Swift and Spencer, 1998). HM

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In the Public's View...

The hidden costs of cancelled operations

The Audit Commission has had a go at cancelled operating lists. This is not, as John Humphreys mistakenly supposed on the *Today* programme, patients who have their operations cancelled unexpectedly. It is sessions that are cancelled because the surgeons are unavailable, and so no patients are called in. Humphreys' misunderstanding was unfortunate, because he expended much indignation over patients' terrible disappointments instead of exploring the reasons behind cancelled sessions.

The Audit Commission are partly right. Some surgeons fail to let operating theatre coordinators know when they will not be there to operate, whether the absence is for holiday, study leave, or whatever. With encouragement, better discipline will solve this problem, but it is not so easy to find staff to fill the theatres. Surgeons have weekly work programmes which include operating sessions, outpatient clinics and inpatient ward rounds. When Mr A and Mrs B are operating, their colleagues are elsewhere. If Mr A goes on holiday, Mrs C or Mr D will still be elsewhere. Few hospitals have a surplus of consultant surgeons, and the increased need for clinical governance activities and intradisciplinary meetings is reducing surgeons' availability for operating.

An added problem is government policy: trainees are not supposed to operate unsupervised. Formerly, surgical firms consisted of one or two consultants, a mix of surgically experienced and inexperienced trainees, and a couple of house officers. If the consultant was away, the experienced trainees could do a list appropriate to their experience. More and more surgeons are cancelling lists when they are away, even if they have experienced trainees. They are too worried about what would happen if a normal operative complication occurred when they were not there, never mind an abnormal one.

The *Observer* ran a story not long ago about the rights of patients to refuse involvement of medical students in their care. Patients do have this right, which is being stressed with the introduction of the new (hopelessly unwieldy) consent forms. Carelessly confusing the issues, the *Observer* failed to distinguish fully between medical students and qualified trainee doctors. The article suggested readers of the *Observer* take care that they were not being 'practised on'.

Patients in the NHS do not have the right to refuse treatment by trainees – properly supervised if necessary, and I hope that politicians have the sense not to take up this particular cudgel to bash doctors with. NHS patients have a moral duty to let trainees treat them. Every doctor has to do their first operation, and no one has the right to demand that doctors 'practise' on someone else. Fully exercised, this 'right' would mean more cancelled lists because of the increasing lack of anyone capable of wielding a scalpel. HM

Dr Neville W Goodman is Consultant Anaesthetist at Southmead Hospital, Bristol