CASE REPORT

CT diagnosis of a large peritoneal loose body: a case report and review of the literature

G GAYER, MD and I PETROVITCH, MD

Department of Radiology, Stanford Medical Centre, 300 Pasteur Drive, Stanford, CA 94035, USA

ABSTRACT. We report a case of a large peritoneal loose body (LPLB), diagnosed on CT. The loose body appeared as a round pelvic mass with central calcifications and a distinct fat plane separating it from adjacent organs. The mass changed its location from the left to the right side of the pelvis within 9 days on repeat imaging. The typical cross-sectional characteristics of a LPLB include a mobile well-circumscribed soft-tissue mass usually with coarse central calcifications. The accurate diagnosis of a LPLB is vital to prevent unnecessary surgical intervention in an asymptomatic patient with an incidentally discovered LPLB.

Received 2 March 2010
Revised 8 May 2010
Accepted 20 May 2010

DOI: 10.1259/bjr/98708052

© 2011 The British Institute of
Radiology

A loose body within the peritoneal cavity originates from a torqued and infarcted epiploic appendage that is detached from the colonic serosa. It is believed that the infarcted appendage gradually transforms into a fibrotic or calcified mass. Many of these lesions are discovered incidentally during abdominal surgery or autopsy [1]. However, this loose body may also be incidentally detected on CT studies performed for unrelated conditions. They have previously been mistaken for neoplastic lesions and therefore surgically removed, often in asymptomatic patients. The characteristic CT features of this lesion are typical, allowing an accurate diagnosis. It is essential for radiologists to be aware of this rare entity and its characteristic features to establish the correct diagnosis and avoid preventable surgery. This is, to the best of our knowledge, the first case report describing this entity in the radiological literature.

Case report

A 59-year-old male with a history of chronic myeloid leukaemia was treated with chemotherapy and a bone marrow transplant 18 years ago. During treatment he developed colitis and required a transverse colon resection as well as reoperation for complications associated with the resection. 10 years later he underwent a resection of a squamous cell carcinoma of the tongue. Since that time he has been followed-up on a regular basis with positron emission tomography (PET)-CT scans. His most recent PET-CT revealed a solitary 1.3 cm hypermetabolic lesion in the right lobe of the liver. It also showed a 3 cm round soft-tissue mass with central calcification in the left pelvis adjacent to the rectosigmoid colon that compressed the left lateral wall of the bladder (Figure 1). There was a distinct fat plane

between the mass and the bladder wall. A contrast CT scan was performed 9 days later for further evaluation of the liver lesion. It revealed CT features suggesting liver metastasis. The pelvic round mass was unchanged in size, shape or appearance; however, its location had changed and it was now located in the right lower quadrant, anterior to the right iliopsoas muscle and to the right of the bladder (Figure 2). Again a distinct fat plane separated the mass and adjacent organs. A previous PET-CT performed 3 years earlier was submitted for comparison. It showed the same round pelvic mass in the left pelvis, compressing the left aspect of the rectosigmoid colon and the posterior bladder wall (Figure 3). The appearance and size of the mass had not significantly changed over the course of 3 years; however, the location had changed in each of the three studies. The centrally calcified mass was deemed to represent a loose body based on its characteristic appearance and its recorded mobility. Therefore, no surgical intervention for removal of this incidentally detected mass was deemed necessary. The patient subsequently developed multiple liver metastases and was lost to follow-up.

Discussion

Mobile pelvic masses are extremely rare. The majority are peritoneal loose bodies, which are presumably a result of the evolution of an infarcted epiploic appendage [1]. The infarcted appendage may undergo aseptic fat necrosis and gradually transform into a fibrotic or calcified mass. It may remain connected to the colonic serosa, or detach from it and remain as a mobile, loose body within the peritoneal cavity [1]. These bodies are mostly pelvic in location, given the fact that they gravitate to the most dependent part of the abdominal cavity [2].

Loose bodies are usually small (0.5–2.5 cm in diameter), do not cause symptoms and are typically found

Address correspondence to: Gabriela Gayer, MD, Department of Radiology, Asaf Harofe Medical Centre, Zrifin 70300, Israel. E-mail: gayer@post.tau.ac.il

Figure 1. Axial non-contrast enhanced CT images from a positron emission tomography-CT study in a 59-year-old man with a large peritoneal loose body in the pelvis. A 3 cm round, well-defined mass (arrow), consisting of peripheral soft tissue and central dense heterogeneous calcifications, is seen in the left pelvis. It causes compression on the left wall of the bladder (B). There is a distinct fat plane around the mass and it does not appear to originate from or invade any of the adjacent organs.

incidentally at laparotomy or autopsy [1]. They may, however, reach a diameter of 5–10 cm, and are then termed “giant” or “huge” peritoneal bodies. These large peritoneal loose bodies are often also asymptomatic, but might be associated with chronic symptoms, mainly abdominal pain. Rare cases of acute urinary retention and small bowel obstruction have been described and are likely to be due to extrinsic compression [2–4].

At surgery, a loose peritoneal body is free-floating within the peritoneum and has a characteristic appearance of an egg-shaped white, hard, glistening concretion.

Figure 2. Axial contrast-enhanced CT images 9 days after the positron emission tomography-CT in the same patient. The well-defined mass (arrow) seen on the prior study in the left pelvis is now seen in the right pelvis. The appearance is identical with that seen 9 days earlier but the location has changed. This time it is anterior to the right iliopectus muscle, cranial and to the right of the bladder (B). Again a distinct fat plane is separating the mass from all of the adjacent organs.

Figure 3. Axial non-contrast enhanced CT image from a positron emission tomography-CT study performed 3 years earlier demonstrates the same mass (arrow) imaged in the later studies as virtually unchanged in morphology. The lesion again is surrounded by a clear fat plane separating it from adjacent organs.

Pathological findings include a core of necrotic, calcified fat laminated by layers of acellular hyalinised fibrous tissue. The cut surfaces of the loose body in one report revealed a central 1.3 cm “nucleus” of a creamy cottage cheese-like material surrounded by calcified lamellae. Plain radiography of the specimen showed the concentric arrangement of calcified radio-opaque layers around a central radiolucent necrotic zone [2].

The radiographic appearance of loose bodies has been described as round or oval calcified masses on plain films and their mobile nature has been recorded on plain abdominal radiographs [1, 5–8]. In contrast, CT and MR features of large peritoneal loose body (LPLB) have been described in only a small number of case reports [2, 9–12].

CT imaging often reveals a concentric round or oval-shaped well-defined mass with central calcification, surrounded by a peripheral soft tissue. The size of the mass is variable ranging from 3 to 9.5 cm. The loose body is generally a single mass, but two large loose bodies have also been reported [2, 13].

On MR, the LPLB appears as a well-circumscribed, low-intensity mass on both T_1 and T_2 weighted images. The MRI signal is similar to that of muscle and a central high intensity area may be seen on T_1 weighted images [11, 12]. The mass does not exhibit any enhancement. The lack of enhancement is expected as there is no blood supply associated with this lesion.

Variability in position of calcified loose bodies has been previously noted on plain abdominal radiographs in publications dating back to 1939 [1, 5–8]. However, this important feature of a mobile mass on CT has only been described in one case report. The authors mention that the mass was mobile since it changed its location during “serial CT scans obtained for the injection purpose”. This unusual feature of varying location did not assist in establishing the diagnosis preoperatively and the mass was resected [10].

The detected loose body on CT and MR in all prior reports was suspected to represent a neoplasm. In the

majority of cases the patients were asymptomatic and the surgical resection was carried out to remove the suspected neoplasm. The correct diagnosis was not suggested pre-operatively in any of the cases; this is likely to be because of the rarity of this entity.

In our patient, with a remote history of colectomy and subsequent abdominal surgeries, the differential diagnosis of a mobile pelvic mass with central calcifications would include either a retained sponge or a loose body. The diagnosis of a retained sponge was dismissed because the central calcification did not resemble a radio-opaque marker and the mass lacked the air bubbles often seen in a retained sponge. In addition, although a retained sponge might migrate and fistulise into adjacent organs, it is likely to induce surrounding inflammatory or fibrotic changes and would not be expected to move freely or be surrounded by a distinct fat plane [14].

The purpose of our case report is to emphasise the characteristic CT features of a LPLB. These consist of a well-defined oval or round soft-tissue mass with central calcification, usually located in the pelvis. Often the mass will have a distinct fat plane separating it from adjacent organs. Since the mass is freely mobile, additional scanning in the prone position or a follow-up CT study can demonstrate the change of location of the mass, facilitating the diagnosis with higher confidence. It is important for radiologists to be aware of the characteristic findings of loose peritoneal bodies to establish the correct diagnosis and avoid unnecessary intervention.

References

1. Ghahremani GG, White EM, Hoff FL, Gore RM, Miller JW, Christ ML. Appendices epiploicae of the colon: radiologic and pathologic features. *Radiographics* 1992;12:59–77.
2. Ghosh P, Strong C, Naugler W, Haghighi P, Carethers JM. Peritoneal mice implicated in intestinal obstruction: report of a case and review of the literature. *J Clin Gastroenterol* 2006;40:427–30.
3. Bhandarwar AH, Desai VV, Gajbhiye RN, Deshraj BP. Acute retention of urine due to a loose peritoneal body. *Br J Urol* 1996;78:951–2.
4. Shepherd JA. Peritoneal loose body causing acute retention of urine. *Br J Surg* 1951;39:185–7.
5. Barden AC. Calcified epiploic appendage: a radiologic curiosity. *Radiology* 1939;33:768–9.
6. Borg SA, Whitehouse GH, Griffiths GJ. A mobile calcified amputated appendix epiploica. *AJR Am J Roentgenol* 1976; 127:349–50.
7. Holt JF, MacIntyre AS. Calcified omental fat deposits; their roentgenologic significance. *AJR Am J Roentgenol* 1958;60: 612–16.
8. Morales O. Calcified appendices epiploicae as freely mobile bodies in the abdominal cavity. *Acta Radiology* 1944;25: 653–61.
9. Mohri T, Kato T, Suzuki H. A giant peritoneal loose body: report of a case. *Am Surg* 2007;73:895–6.
10. Murat FJ, Gettman MT. Free-floating organized fat necrosis: rare presentation of pelvic mass managed with laparoscopic techniques. *Urology* 2004;63:176–7.
11. Nomura H, Hata F, Yasoshima T, Kuwahara S, Naohara T, Nishimori H, et al. Giant peritoneal loose body in the pelvic cavity: report of a case. *Surg Today* 2003;33:791–3.
12. Takayama S, Sakamoto M, Takeyama H. Clinical challenges and images in GI. Image 1: huge peritoneal loose body in the pelvic cavity. *Gastroenterology* 2009;136:404–730.
13. Takada A, Moriya Y, Muramatsu Y, Sagae T. A case of giant peritoneal loose bodies mimicking calcified leiomyoma originating from the rectum. *Jpn J Clin Oncol* 1998;28: 441–2.
14. Zantvoord Y, van der Weiden RM, van Hooff MH. Transmural migration of retained surgical sponges: a systematic review. *Obstet Gynecol Surv* 2008;63:465–71.