Radiology Case Reports 19 (2024) 5492–5495

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Unveiling the rarity: A case report of giant peritoneal loose body ☆

Abdudin Heru Mehammed[a,*], *Natnael Alemu Bezabih*[b], *Muluken Yifru Gebresilassie*[a], *Yohanna Aregawi Hailu*[c], *Mengistu Yismie Semahegn*[c], *Misganaw Yigletie Damtie*[a]

[a] *Department of Radiology, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia*
[b] *Department of Radiology, Addis Ababa University, College of Health Sciences, Addis Ababa, Ethiopia*
[c] *Department of Surgery, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia*

ARTICLE INFO

Article history:
Received 26 May 2024
Revised 5 August 2024
Accepted 7 August 2024

Keywords:
Peritoneal loose body
Epiploic appendages

ABSTRACT

Peritoneal loose bodies, also referred to as peritoneal mice, are formed by torsion of epiploic appendages detaching from the large bowel, subsequently becoming loose within the peritoneal cavity. While often discovered incidentally during laparotomy or autopsy, emerging reports suggest they can manifest with diverse symptoms. Here, we present a 61-year-old patient experiencing lower abdominal pain and irritative voiding symptoms, ultimately diagnosed with a giant peritoneal loose body measuring 6.5 cm. Computed tomography (CT) imaging showed a well-circumscribed soft-tissue density mass with central calcifications, which was later confirmed during surgery. Only a few cases have been reported on giant peritoneal loose bodies. We also highlight characteristic features of imaging to establish the correct diagnosis.

Introduction

Peritoneal loose bodies were initially documented by Harrigan in 1917, in a case series involving free epiploic appendages [1]. Typically, these bodies are small, measuring between 0.5 and 2.5 cm in diameter, and frequently remain asymptomatic. However, "giant" peritoneal loose bodies, exceeding 5 cm in diameter, patients may experience symptoms such as chronic abdominal pain and may present acutely due to extrinsic compression leading to urinary retention or intestinal obstruction [2,3].

Clinical presentation

A 61-year-old male patient presented with chronic intermittent lower abdominal pain with urinary symptoms including increased frequency, urgency, and nocturia. He had a normal urinary stream and lacked voiding symptoms such as hesitancy, straining, and terminal dribble. Additionally, there were

☆ Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

* Corresponding author.
E-mail address: abdudin.heru@sphmmc.edu.et (A.H. Mehammed).

https://doi.org/10.1016/j.radcr.2024.08.025

no reports of hematuria or gastrointestinal symptoms. Physical examination, including a per-rectal examination, yielded unremarkable findings. Both full blood count and urinalysis returned normal results. Suspecting bladder outlet obstruction, the patient underwent further investigation via transabdominal ultrasound at regional government hospital, revealing a normal sized prostate. However, a distinct hypoechoic peritoneal mass with internal calcifications was identified, prompting a subsequent investigation by abdominopelvic CT scan. Then he was referred to our hospital for abdominopelvic CT scan and further management.

Imaging findings

The abdominopelvic CT scan revealed a well-defined, rounded soft tissue attenuating mass with a central densely calcified component (Fig. 1). The lesion was seen within the peritoneal cavity at the level of the pelvic inlet posterior to the right rectus abdominis muscle (Fig. 2) measuring 6.5 cm in length, 5.9 cm in width, and 6.4 cm in height. While it caused mild displacement of the adjacent small bowel loops, no mass effect on the bladder was observed. The mass was surrounded by a clear layer of fat, with no visible vascular connections, indicating its independence from neighboring organs. Subsequent postcontrast images revealed no enhancement (Fig. 3). During the operation, the mass was successfully isolated and found not to be attached to nearby structures. It had a yellowish hue and a firm consistency. When dissected, the mass revealed a whitish central area, which likely indicated a calcified component (see Fig. 4).

Management

Since the patient was having long standing intermittent abdominal pain, an elective exploratory laparotomy was performed, revealing a glossy white, round, firm mass. Interestingly, the loose body was found in a different location from the CT image; it was located in the left upper quadrant peritoneal cavity during the surgical exploration.

Fig. 1 – Axial noncontrast abdominal CT at the level of the pelvic inlet shows a rounded well-defined soft-tissue density peritoneal mass with central chunky calcification.

Fig. 2 – Coronal noncontrast abdominal CT shows proximity of the mass and the urinary bladder with clear fat plane in between.

Discussion

The exact incidence of peritoneal loose bodies remains unknown due to its rarity and often asymptomatic nature. However, they are more commonly observed in males aged 40-70 years. Typically, these bodies are small, ranging from 0.5 to 2.5 cm in diameter. Loose bodies greater than 5 cm are extremely uncommon and referred to as "giant" [3,4]. The largest reported case was documented in 2007 by Mohri et al. [5], describing a loose body measuring 9.5 cm in diameter in a 73-year-old man.

The pathogenesis of peritoneal loose bodies starts with chronic torsion of the Epiploic appendages. These appendages, numbering between 50 and 100, are peritoneum-lined protrusions of subserosal fat originating from the surface of the large bowel, spanning from the cecum to the rectosigmoid junction. They are attached to the antimesenteric border of the large bowel with a thin pedicle which makes them prone to torsion, leading to infarction or aseptic fat necrosis [6–8]. Thereafter, saponification and calcification of the fatty contents occur and the pedicle atrophies then detaches to become a free peritoneal loose body [6,8].

Initially, the size of these loose bodies is small, as the normal size of epiploic appendages typically measures 1.5 × 3.5 cm. However, as they undergo saponification and calcification, an exudative serum rich in proteins, predominantly composed of albumin, accumulates around them. This accumulation leads to the formation of peripheral fibrous layers, gradually increasing the size of the loose body over time [5,9–11]. This theory was then proved in 1968 by Donado and Kerr by placing peri-uterine fat from guinea pigs in the peritoneal cav-

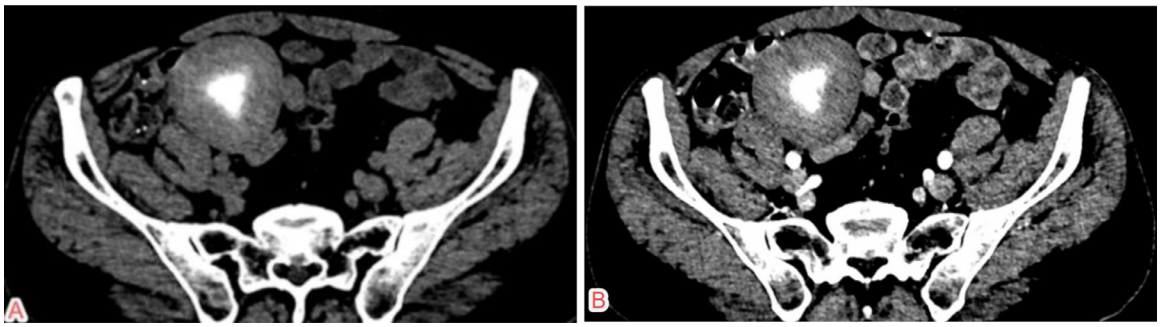

Fig. 3 – Pre- (A) and postcontrast (B) axial CT at the level of the pelvic inlet shows no enhancement of the peripheral soft-tissue component of the mass.

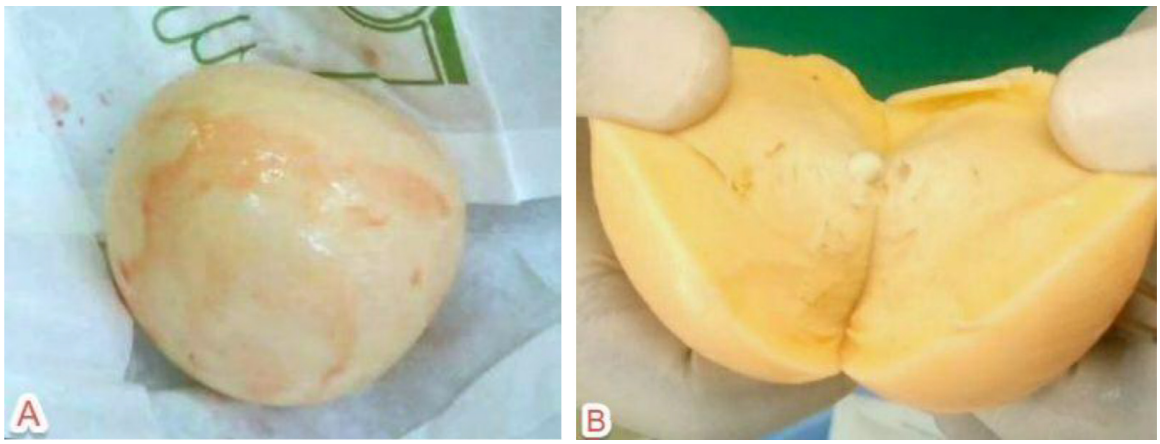

Fig. 4 – Intraoperative photographic images (A and B) showing round shaped yellowish hard mass. The cut image (B) shows whitish central component likely representing calcified component.

ity of the same animal forming an experimental loose body which became larger in size over time [12].

Peritoneal loose bodies are often asymptomatic and incidentally found on autopsy and surgery. In some cases, especially with larger loose bodies various symptoms have been reported and the most commonly reported are chronic abdominal pain and urinary symptoms [13].

In rare instances, external compression of the gastrointestinal and genitourinary tract by these enlarged loose bodies may lead to acute presentations, such as intestinal obstruction and acute urinary retention [14,15]. On CT scan peritoneal loose bodies have a classic appearance of centrally calcified soft tissue mass having no enhancement on contrast studies [2,6,13]. Because they are freely suspended within the peritoneum, peritoneal loose bodies commonly localize to dependent regions, such as pelvic cavity. Desmoid and carcinoid tumors are differential that should be taken into account when the mass is found in the abdomen [16]. A desmoid tumor, a benign neoplasm, usually appears on CT scans as a well-defined, solid soft tissue mass with postcontrast enhancement. The absence of enhancement goes against the typical characteristics of desmoid tumors [21]. Mesenteric carcinoid tumors, usually from bowel metastasis, exhibit calcification, strong postcontrast enhancement, and adjacent mesenteric desmoplastic reactions. The lack of enhancement is not a common feature of carcinoid tumors [22]. The presence of a clear fat plane, absence of communication with any organ, characteristic chunky calcification, and lack of enhancement strongly supports the diagnosis of peritoneal loose bodies. Additionally, the change in position observed on repeated scans serves as an extremely helpful diagnostic feature [13,17]. A case report in 2011 by Gayer et al. demonstrated this phenomenon, wherein the location of the peritoneal loose body changed after 9 days of a repeat scan [18]. Peritoneal loose bodies usually appear as low-intensity, well-circumscribed masses on T1 and T2-weighted MRI scans. No specific treatment is necessary in asymptomatic patients. The decision to remove peritoneal bodies mainly depends on whether they cause gastrointestinal and genitourinary symptoms or if the diagnosis becomes uncertain. Laparoscopic surgery is safe and effective in retrieving symptomatic peritoneal loose bodies [14,19,20].

Conclusion

Although peritoneal loose bodies are rare, they should still be considered as a potential differential diagnosis for mobile intraperitoneal mass lesions. To aid in their identification

and narrow down the differential diagnosis, dynamic imaging techniques such as ultrasound or repeated cross-sectional imaging (CT and MRI) in different positions can be useful in assessing their mobility.

Patient consent

Complete written informed consent was obtained from the patient for the publication of this study and accompanying images.

REFERENCES

[1] Harrigan AH. Torsion and inflammation of the appendices epiploicae. Ann Surg 1917;66(4):467–78.
[2] Gayer G, Petrovitch I, Jeffery RB. Foreign objects encountered in the abdominal cavity at CT. Radiogr Rev Publ Radiol Soc N Am Inc 2011;31(2):409–28. [Internet]. [Accessed May 24, 2024.]. Available from https://pubmed.ncbi.nlm.nih.gov/21415187/.
[3] Obaid M, Gehani S. Deciding to remove or leave a peritoneal loose body: a case report and review of literature. Am J Case Rep 2018;19:854–7.
[4] Jang JT, Kang HJ, Yoon JY, Yoon SG. Giant peritoneal loose body in the pelvic cavity. J Korean Soc Coloproctol 2012;28(2):108–10.
[5] Mohri T, Kato T, Suzuki H. A giant peritoneal loose body: report of a case. Am Surg 2007;73(9):895–6.
[6] Ghahremani GG, White EM, Hoff FL, Gore R, Miller J, Christ M. Appendices epiploicae of the colon: radiologic and pathologic features. Radiographics 1992;12(1):59–77.
[7] Rashid A, Nazir S, Hakim SY, Chalkoo MA. Epiploic appendagitis of caecum: a diagnostic dilemma. Ger Med Sci GMS E-J 2012;10:Doc14.
[8] HP D. Infarction of an epiploic appendage. J Clin Gastroenterol 1993;16:323–5.
[9] Sewkani A, Jain A, Maudar K, Varshney S. Boiled egg' in the peritoneal cavity-a giant peritoneal loose body in a 64-year-old man: a case report. J Med Case Reports 2011;5(1):297.
[10] Rajakannu M. Giant peritoneal loose body in a patient with haemorrhoids. Trop Gastroenterol 2010;31(2):132–3.
[11] Rajbhandari M, Karmacharya A, Shrestha S. Pathological diagnosis of peritoneal loose body: a case report. Pathology (Phila) 2014;46:S83.
[12] Donald K. Peritoneal loose bodies. Aust N Z J Surg 1968;37:403–6.
[13] Kim HS, Sung JY, Park WS, Kim YW. A giant peritoneal loose body. Korean J Pathol 2013;47(4):378–82.
[14] 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(5):427.
[15] Zouine Y, Mennis N, Gakosso C, Boutakioute B, Idrissi MO, Idrissi N. Giant peritoneal loose body causing acute intestinal obstruction: case report. Sch J Med Case Rep 2023;6:1132–3.
[16] 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(7):441–2.
[17] Sang W, Li Y, Hong X, Qu H, Zhu R, Yi Q. Giant peritoneal loose body and its protein composition: a case report. BMC Urol 2024;24(1):43.
[18] Gayer G, Petrovitch I. CT diagnosis of a large peritoneal loose body: a case report and review of the literature. Br J Radiol 2011;84(1000):e83–5.
[19] Bhandarwar A, Desai V, Gajbhiye R, Deshraj B. Acute retention of urine due to a loose peritoneal body. Br J Urol 1996;78(6):951–2.
[20] Makineni H, Thejeswi P, Prabhu S, Bhat RR. Giant peritoneal loose body: a case report and review of literature. J Clin Diagn Res JCDR 2014;8(1):187–8.
[21] Tan CH, Pua U, Liau KH, Lee HY. Mesenteric desmoid tumour masquerading as a fat-containing cystic mass. Br J Radiol 2010;83(994):e200–3.
[22] Park IS, Kye BH, Kim HS, Kim HJ, Cho HM, Yoo C, et al. Primary mesenteric carcinoid tumor. J Korean Surg Soc 2013;84(2):114–17.