Case report

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Five simultaneous peritoneal loose bodies: a case report and literature review

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Abstract

We present the case of a patient with five peritoneal loose bodies (PLBs). The patient, admitted due to prostatic hyperplasia, had multiple movable masses in the abdomen detected during a routine physical examination. Ultrasound, CT, and MRI revealed several roundish masses in the abdominal and pelvic cavities, which were subsequently removed via laparotomy. PLBs are rare entities, often identified incidentally during surgery. Their formation is believed to result from necrosis and exfoliation of abdominal and pelvic tissues. To our knowledge, this is the first reported case with such a high number of PLBs, contributing to an enhanced understanding of this uncommon condition.

Keywords: peritoneal loose body; imaging; diagnosis

Introduction

Littre reported the first case of peritoneal loose body (PLB) in 1703, also referred as "peritoneal mice", but it has not been widely recognized because of its rarity [1-2]. PLB is a free-floating mass within the abdominal cavity, typically presenting as a white or light-gray, egg-shaped structure with a smooth surface [3-4]. It is often discovered incidentally during surgery and is usually small in size, causing no obvious symptoms and occurs more often in older men [5]. PLBs larger than 5 cm are rare and may produce corresponding compressive symptoms, such as abdominal discomfort, pain, and intermittent constipation [6-8].

Case report

A 65-year-old male patient was admitted for evaluation of prostatic hyperplasia. The patient had a medical history of lumbar spine surgery. Physical examination revealed multiple mobile abdominal masses, firm in texture. Laboratory tests and tumor marker assessments were unremarkable. Ultrasound examination identified four roundish masses in the abdominal and pelvic cavities, all of which had regular shapes and smooth edges. The masses were predominantly hypoechoic, with irregular patchy strong echoes centrally, accompanied by acoustic shadows. Color Doppler Flow Imaging (CDFI) did not reveal any blood flow signals and contrast-enhanced ultrasound (CEUS) demonstrated no enhancement in the masses, suggesting a lack of blood supply. A CT scan revealed five rounded high-density masses located in the abdominal and pelvic cavities. These masses were situated in the posterior rectum, left paracolic groove, left upper abdomen, right paracolic groove, and right upper abdomen, with the largest measuring approximately 8.7×6.1×6.2 cm. All the masses exhibited smooth edges, and varying degrees of central calcification were observed. The surrounding tissues and organs appeared compressed and displaced. MRI demonstrated multiple low-signal mass shadows on both T1 and T2 weighted sequences, all with smooth edges and a few irregularities, slightly high-signal areas centrally. Core needle biopsy under ultrasound guidance yielded grayish-white tissue samples. Microscopic examination showed no structural vitrified tissue with calcification, and no conclusions could be drawn (fig 1).

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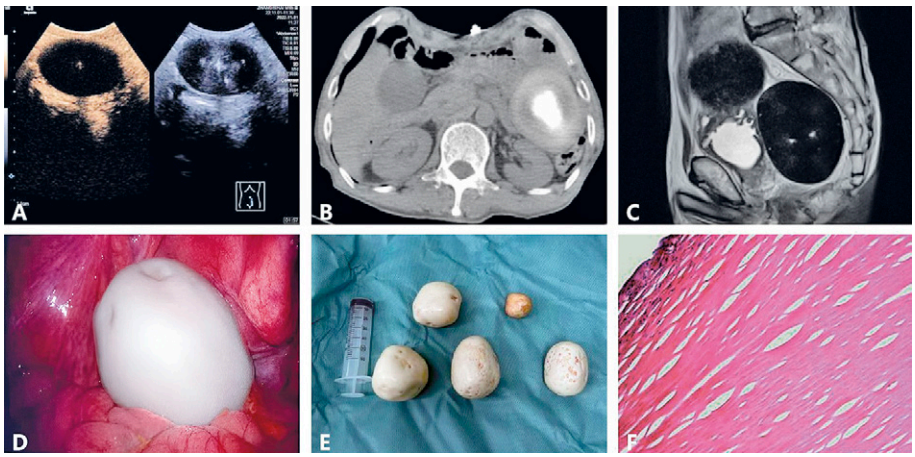


Fig 1. Imaging and pathological findings of a peritoneal loose body: A) CEUS showing an oval hypoechoic mass with smooth edges and no enhancement; B) CT scan showing a high-density mass with central calcification; C) MRI scan (T2-weighted image, sagittal view) showing two masses in the pelvis with compression of surrounding tissues; D) laparoscopic view of a white mass with a glossy surface and no adhesion to surrounding tissues; E) the five grayish-white masses of varying sizes; F) histopathology (H&E staining,×100) showing laminated red-stained fibrous tissue with no cellular components.

During laparoscopic surgery, the masses proved challenging to remove, necessitating conversion to laparotomy. A total of five round, white masses were excised, all exhibiting smooth surfaces and firm textures. The masses were mobile and showed no adhesions to surrounding tissues or organs. The patient recovered well after the procedure.

Discussion

Although the exact etiology remains unclear, researchers postulate that PLB formation is associated with necrosis and exfoliation of abdominal tissues [9]; PBL continue to roll and become wrapped in the abdominal cavity, and finally, the appearance of boiled egg is gradually formed in the warm environment of the abdominal cavity [1,3,9-10]. PLBS are usually small, ranging from 0.5 to 2.5 cm in diameter, but can reach 5 to 10 cm, hence the term “giant” or “huge” PLBS [11].

Preoperative diagnosis of EPC is challenging due to its rarity [1]. Accurate diagnosis of PLB can only be achieved by a general understanding of the characteristics of PLB, and imaging examination plays an important role in the diagnosis [6]. Radiography or ultrasonography showed calcified lesions in the abdomen that moved with the patient’s position. The CT features are well-defined ovoid or spherical soft tissue masses with central calcification and a distinct peripheral fat layer separating them from adjacent organs. The MRI signal was similar to that of muscle, with a central hyperintense area visible on T1-weighted images [8]. PLB showed no enhancement during contrast enhanced scanning. However, imaging diagnosis needs to be evaluated to distinguish from teratoma, fibroma, urinary calculus, gallstone, foreign body granulomas,etc [1,12]. Key diagnostic features of PLB include: 1) Free movement – the position of the PLB changes with changes in body posture, but rarely, their position is fixed [8]; 2) absence of blood supply – regardless of size, no significant enhancement is observed in contrast-enhanced imaging techniques [6,13]; 3) Laboratory tests – tumor markers are unremarkable in most of the patients [7]. Pathological findings typically include core necrosis, a calcified fat layer, and an acellular clear fibrous layer [10]. PLBS do not require surgery unless they are large and associated symptoms of compression are present, when malignancy is suspected [8,12]. Due to its rarity and unfamiliarity with many clinicians, this often leads to misdiagnosis and unnecessary surgical treatment [14]. This lack of awareness contributed to the failure to diagnose the condition correctly with ultrasound, CT, and MRI prior to surgery in the current case. Finally, it is noteworthy that PLBS are typically solitary, with only a few reports in the literature documenting cases of patients having two PLBS simultaneously [3,15-16]. To our knowledge, no prior study has reported a patient presenting with five PLBS.

Conclusion

PLB is a rare disease with distinct clinical, imaging, and pathological features. This case is unique as it represents the first documented instance of a patient presenting with five PLBS simultaneously. Supported by comprehensive imaging and clinical data, this report expands current understanding of this rare condition. Recognizing the features of PLBS are essential to minimizing misdi-

agnosis. A correct diagnosis allows patients to make informed decisions between surgical or conservative, thus avoiding unnecessary surgical interventions.

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