Case Report

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Exploratory laparoscopy as first choice procedure for the diagnosis of giant peritoneal loose body: a case report

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Abstract

Peritoneal loose body (PLB) is an extremely rare clinical entity, and its preoperative diagnosis is often difficult. We report a case of giant PLB (GPLB) confirmed by exploratory laparoscopy. A 46-year-old man was admitted to hospital with an abdominal mass and urinary frequency. He underwent clinical and laboratory tests and computed tomography (CT), which indicated a lesion at the bottom of the bladder. Exploratory laparoscopic surgery revealed a GPLB, which was subsequently removed. The patient was comfortable after surgery and was discharged 3 days later. His symptoms of frequent urination improved during the 1-month follow-up period. The egg-shaped mass excised from the peritoneal cavity measured $45 \times 40 \times 33$ mm. This case indicates that exploratory laparoscopy can be considered as the first-choice diagnostic procedure for patients with GPLB.

Keywords

Peritoneal loose body, laparoscopic exploration, urinary frequency, differential diagnosis, abdominal mass, computed tomography

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Background

Peritoneal loose body (PLB), or "peritoneal mouse", is an extremely rare clinical entity that is often found incidentally during laparotomy or autopsy. In most cases, PLBs are derived from the epiploic appendices via sequential torsion, infarction,

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saponification, and calcification. Most PLBs range from 5 to 20 mm in diameter, but they can occasionally grow to >50 mm by absorbing serum proteins from the peritoneal cavity. Herein, we report a case of a giant PLB (GPLB) found incidentally in the abdominal cavity and confirmed by exploratory laparoscopy.

Case presentation

A 46-year-old male patient was admitted to the general surgery ward of our hospital in October 2019 with an abdominal mass. He had no signs of fever, nausea, vomiting, abdominal distension, abdominal pain, urgency, or heavy weight. He had no previous history of abdominal surgery and his physical examination was normal. In laboratory tests, his white blood cells and platelets were 6.39×10^9/L and 263×10^9/L, respectively, and digestive tract tumor markers were within the normal range. Abdominal computed tomography (CT) revealed a round soft-tissue density shadow measuring about 3.3 mm with a smooth edge in the pelvic cavity at the bottom of the bladder. A circular calcification and small round fat mass were also observed, but were less obvious. A contrast-enhanced scan revealed slight delayed contrast-enhancement in the lesion area (Figure 1). Based on CT examination, the lesion was suspected to be a teratoma.

Abdominal exploratory laparoscopy was carried out after a complete preoperative examination and provision of signed surgical consent. A pure white, elastic, egg-shaped mass, completely free from the pelvic cavity, diagnosed as a GPLB, was detected in front of the rectum (Figure 2). The GPLB was removed, and measured approximately 45 mm in diameter (Figure 3a). Following laparoscopic incision, a calcified core was observed in the GPLB, with a diameter of about 15 mm, and the surrounding tissues tended to be more

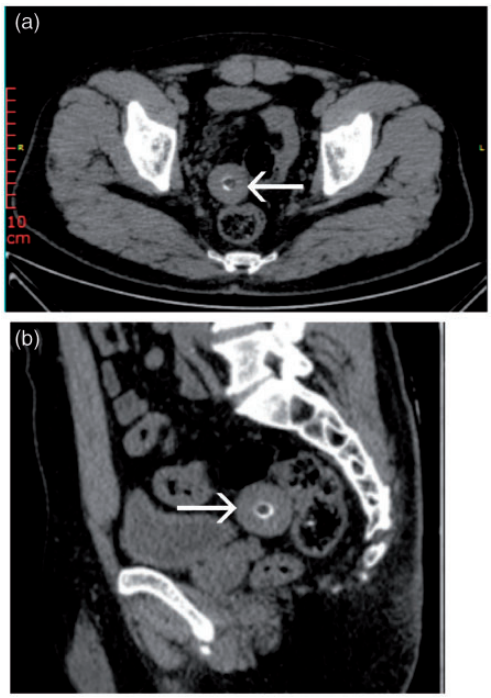

Figure 1. Abdominal computed tomography findings. (a) Axial image demonstrated a low-density lesion with complete capsule and central calcification (white arrow). (b) Sagittal image showed the mass (white arrow) in front of the rectum.

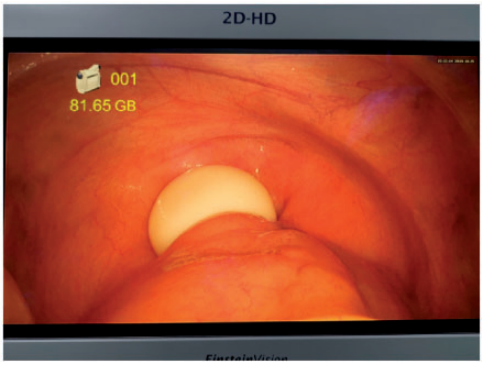

Figure 2. Laparoscopic findings. A pure white, elastic, egg-shaped body, completely free from the pelvic cavity, was found in front of the rectum.

concentric (Figure 3b). A careful assessment of the patient's previous medical history showed that he had started to complain of bladder irritation about 20 years previously. Histologically, the lesion appeared to be well-circumscribed, with an obvious hyalinized fibrosclerotic center. The middle was composed mainly of adipose tissue, which was partially necrotic, and the periphery comprised wrapped fibrous tissue characterized by significant hyaline degeneration and calcification. Moreover, the lesion was paucicellular, containing bundles of spindled fibroblasts embedded in a collagenous stroma (Figure 4). The patient felt reasonably well after laparoscopic surgery and was discharged from hospital 3 days later. His symptoms of urinary frequency improved during the 1-month follow-up period.

The authors would like to thank the patient for allowing them to publish this case report and for the use of the images taken during his hospital admission.

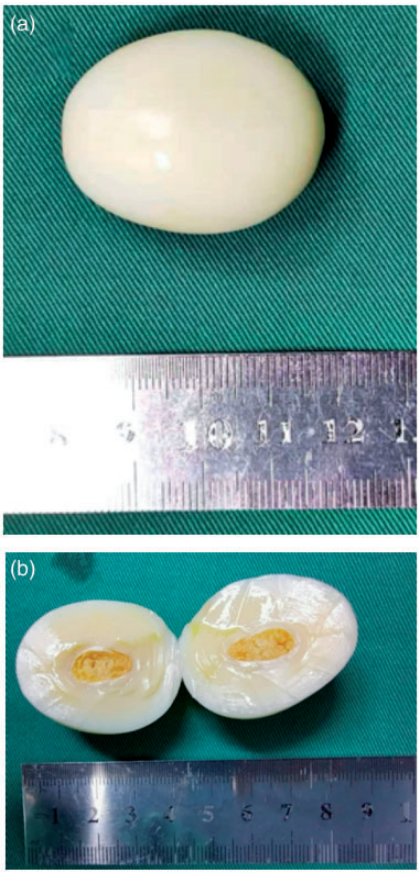

Figure 3. Gross pathologic examination. (a) The peritoneal loose body was 45 × 40 × 33 mm in size, oval-shaped, elastic, yellow-white in appearance, and smooth on the surface, with no obvious fibrous capsule. (b) There was a calcified core filled with yellow cheese-like material.

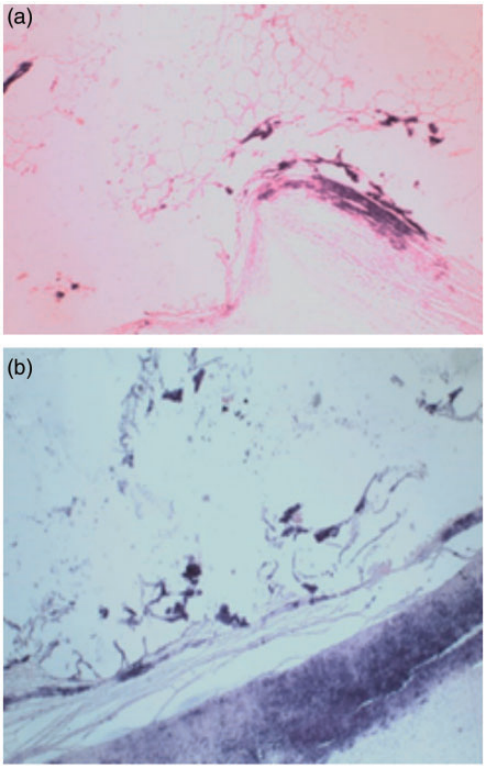

Figure 4. Histologic findings. (a) The lesion consisted of a well-circumscribed mass with an obviously hyalinized fibrosclerotic center, composed of adipose tissue, which was partially necrotic. (Hematoxylin and eosin ×40). (b) The periphery included wrapped fibrous tissue with significant hyaline degeneration and calcification. The lesion was paucicellular, containing spindled fibroblasts embedded in a collagenous stroma. (Hematoxylin and eosin ×40).

Discussion

PLB is an extremely rare disease worldwide, with limited information regarding its incidence and risk factors. Only 38 cases of PLB have been reported in the literature to date.[1] Preoperative diagnosis is often difficult, and PLBs are usually found by chance during physical examination, surgical exploration, or autopsy. Most patients with PLBs have no clinical symptoms, despite the presence of large free bodies in the abdominal cavity, often reaching a diameter >5 cm. However, the resulting compression of the surrounding organs can lead to mild clinical manifestations, including abdominal pain, intestinal obstruction, urinary retention, and frequent urination.[2,3]

Very few cases of GPLB have been reported worldwide. Given that most GPLBs probably remain undetected throughout the patient's life, it is difficult to estimate the probability of its occurrence and it is unlikely to be prevented. In addition, the clinical pathogenesis of GPLB remains largely unclear. Several reports[4–6] have suggested that PLBs are derived from both intestinal and omental fat. Their formation usually begins with spontaneous torsion of an appendix epiploica, followed by ischemia, saponification, and calcification, and they subsequently increase in size as a result of deposition from free fluid in the abdominal cavity, with a "snowball" effect.[4–6]

PLBs are free in the abdominal cavity and therefore have no fixed position and may occur in front of or beside the rectum, or between the intestines, and may move as a result of changes in body position, respiratory movements, and gastrointestinal motility. Because the disease is rare in clinical practice, most physicians and radiologists lack knowledge of PLBs, and GPLBs are often misdiagnosed as stromal tumors or teratomas, with a rate of misdiagnosis following CT as high as 63%.[1] PLBs typically appear as a central calcified nodule on CT, with soft-tissue density at the periphery and a clear, smooth boundary.[6–8]

The current patients underwent CT, but not magnetic resonance imaging (MRI) examination. CT and/or MRI can be employed to diagnose PLB, but each has its own drawbacks. CT examination focuses on the calcified area in the center of the lesion, while MRI examination, especially reverse-phase chemical shift imaging, can better display the low-intensity mass around the calcified area. However, PLB does not exhibit obvious contrast enhancement, which is particularly useful for its differential diagnosis with leiomyoma and teratoma.[5] MRI, in combination with a new algorithm, may thus be used to increase the diagnostic accuracy of PLB lesions.[1]

Understanding the specific features of GPLB before surgery can help to prevent its misdiagnosis and avoid unnecessary surgical exploration. Notably, small asymptomatic PLBs often require no special treatment and can be monitored by regular medical reviews; however, active surgical exploration (i.e., laparoscopy or open surgery) remains the best option for patients with GPLB.[9,10]

Exploratory laparoscopy has been widely used by surgeons for the detection and management of PLBs.[2,4,6,9–14] The use of laparoscopic procedures is currently increasing,[2,10] and laparoscopic surgery can reduce surgical damage, minimize postoperative complications, and shorten recovery time.[15] The current patient was discharged from hospital 3 days after surgery, and his complaint of frequent urination resolved during the follow-up period.

In conclusion, exploratory laparoscopy should be considered as the first-choice diagnostic procedure for patients with GPLB.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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