—Case Reports—

A Case of a Fixed Giant Peritoneal Loose Body outside the Peritoneum and near the Rectovesical Excavation

Kotaro Nanno, Seiichi Shinji, Takeshi Yamada, Akihisa Matsuda, Ryo Ohta, Hiromichi Sonoda, Takuma Iwai, Kohki Takeda, Kazuhide Yonaga, Koji Ueda, Sho Kuriyama, Toshimitsu Miyasaka, Hiromasa Komori, Yoshinobu Shioda and Hiroshi Yoshida

Departments of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School, Tokyo, Japan

A peritoneal loose body (PLB) is tissue completely separated from other intraperitoneal organs. It is rare and usually found incidentally during laparotomy, examination, or autopsy. PLBs are usually located free in the peritoneal cavity and not in the extraperitoneal space. They are thought to originate when epiploic appendices are released into the abdominal cavity after ischemic necrosis. We report a case of a giant PLB outside the peritoneal cavity, adjacent to the rectovesical excavation, that was identified preoperatively in an asymptomatic 83-year-old man undergoing evaluation for cholecystolithiasis. Computed tomography revealed a mass with well-defined margins in the rectovesical excavation. The mass (diameter, 60 mm) consisted of a calcified core and peripheral soft tissue and did not appear to invade adjacent organs. Although there were no symptoms or tumor growth over time, we scheduled a laparoscopic extraction for definitive diagnosis. On laparoscopic exploration, a white ovoid mass was found in the rectovesical excavation; there was no invasion of adjacent organs. We diagnosed a giant PLB. Postoperative recovery was uneventful. Most PLBs are asymptomatic and do not require surgery, except when symptoms are present, when the PLB is large, or when malignancy is suspected. PLB is rarely extraperitoneal and is usually freely mobile; however, in our patient, it was fixed and outside the abdominal cavity, near the rectovesical fossa. Although it could not be diagnosed preoperatively as being extraperitoneal, imaging findings were typical of PLB; thus, it was possible to remove the mass laparoscopically without bowel resection. (J Nippon Med Sch 2023; 90: 276–281)

Key words: extraperitoneal, peritoneal loose body, giant, fixed, laparoscopic surgery

Introduction

The term peritoneal loose body (PLB) is used to describe tissue that is completely separated from other intraperitoneal organs[1]. It is quite rare and presents as a small (diameter, 5-20 mm) white or pale gray ovoid mass. It is usually asymptomatic and found incidentally during laparotomy, examination, or autopsy[2]. It is generally thought to originate when epiploic appendices are released into the abdominal cavity after ischemic necrosis and is usually free-floating in the peritoneal cavity[3]. Surgery is required when a PLB is large or malignancy is suspected. However, preoperative diagnosis is difficult and often requires invasive surgery such as laparotomy. Herein, we report a case of a giant PLB outside the peritoneum and near the rectovesical excavation that was treated by laparoscopic extraction.

Case Presentation

An 83-year-old man with no symptoms underwent evaluation for cholecystolithiasis. Computed tomography (CT) incidentally revealed a well-circumscribed mass (diameter, 60 mm) in the rectovesical excavation consisting of a calcified core and peripheral soft tissue; it did not seem to invade adjacent organs (**Fig. 1**). Magnetic resonance imaging (MRI) showed a hypointense mass with well-defined margins on both T1- (**Fig. 2A**, arrow) and T

Correspondence to Seiichi Shinji, MD, PhD, Departments of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School, 1–1–5 Sendagi, Bunkyo-ku, Tokyo 113–8603, Japan
E-mail: s-shinji@nms.ac.jp
https://doi.org/10.1272/jnms.JNMS.2023_90-302
Journal Website (https://www.nms.ac.jp/sh/jnms/)

2-weighted images (**Fig. 2B**, arrow). On the basis of these radiologic findings, a tentative preoperative diagnosis of peritoneal calcifying fibrous pseudotumor (such as a peritoneal loose body) was made. The differential diagnoses were rectal gastrointestinal stromal tumor and leiomyoma. The patient was asymptomatic and had no history of medical problems. Laboratory test results, including those for tumor markers, were all within normal ranges. During a 6-month follow-up, neither symptoms nor growth of the mass was observed. We scheduled a laparoscopic extraction after performing laparoscopic cholecystectomy for a definitive diagnosis. On laparoscopic exploration, a white ovoid mass was found in the rectovesical excavation outside the peritoneum; there was no invasion of adjacent organs (**Fig. 3**). We diagnosed giant PLB, which was extracted through an enlarged median incision with partial use of hand-assisted laparoscopic surgery. The extracted specimen measured 60 × 55 × 50 mm and was whitish and ovoid; it had a bony-hard and slightly glossy surface (**Fig. 4A**). The cut surface of the ovoid mass had a concentrically lamellar structure (**Fig. 4B**). Histologically, the tissue was stained with eosin and appeared partially calcified; it had no cellular component (**Fig. 5**). These histopathological findings were characteristic of PLB. Postoperative recovery was uneventful, and the patient was discharged 5 days after surgery.

Written informed consent was obtained from the patient for publication of this case report.

Fig. 1 Computed tomography shows a well-circumscribed mass in the rectovesical excavation of an 83-year-old man. The mass consists of a calcified core and peripheral soft tissue, measures 60 mm in diameter (arrow), and does not appear to invade adjacent organs.

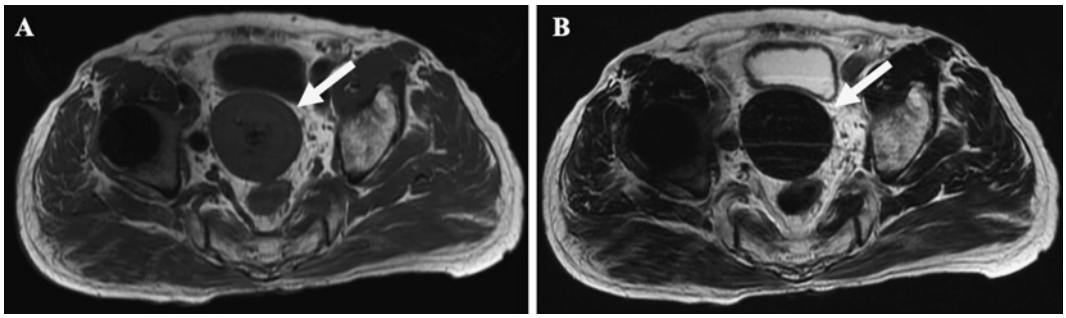

Fig. 2 Magnetic resonance imaging findings. (A, arrow) T1-weighted imaging; (B, arrow) T2-weighted imaging. Both T1- and T2-weighted images show a mass and intensity similar to that of muscle tissue.

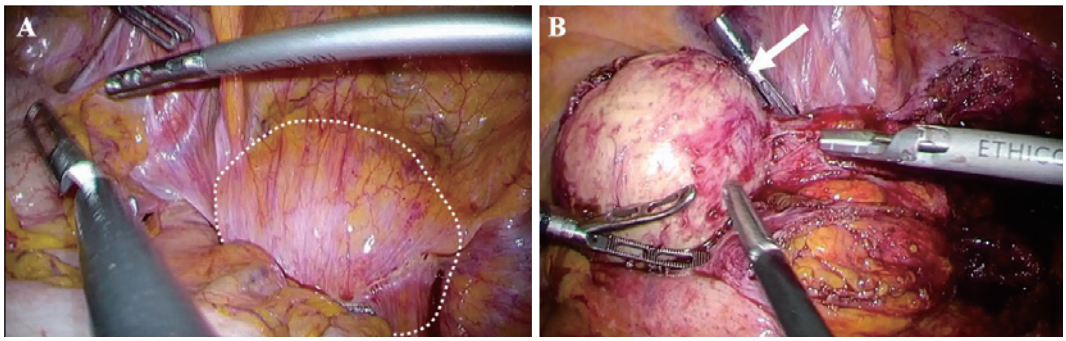

Fig. 3 Laparoscopic examination revealed a white ovoid mass covered by peritoneum and fixed at the rectovesical excavation (A, dotted line, B, arrow). No invasion of adjacent organs is seen.

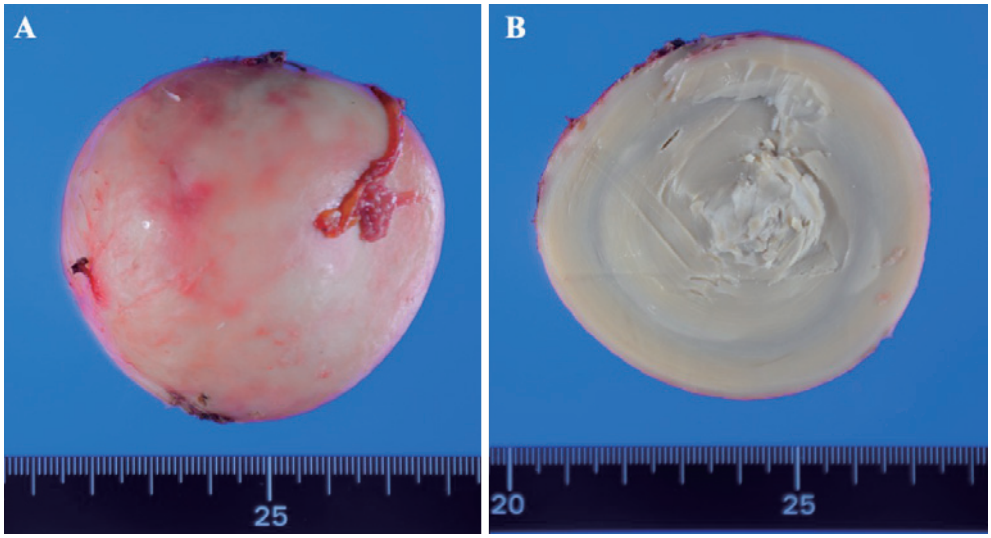

Fig. 4 Extracted specimen. The peritoneal loose body, measuring 60 mm, was white and ovoid and had a bony-hard and slightly glossy surface (A). The cut surface of the ovoid mass had a concentrically lamellar structure (B).

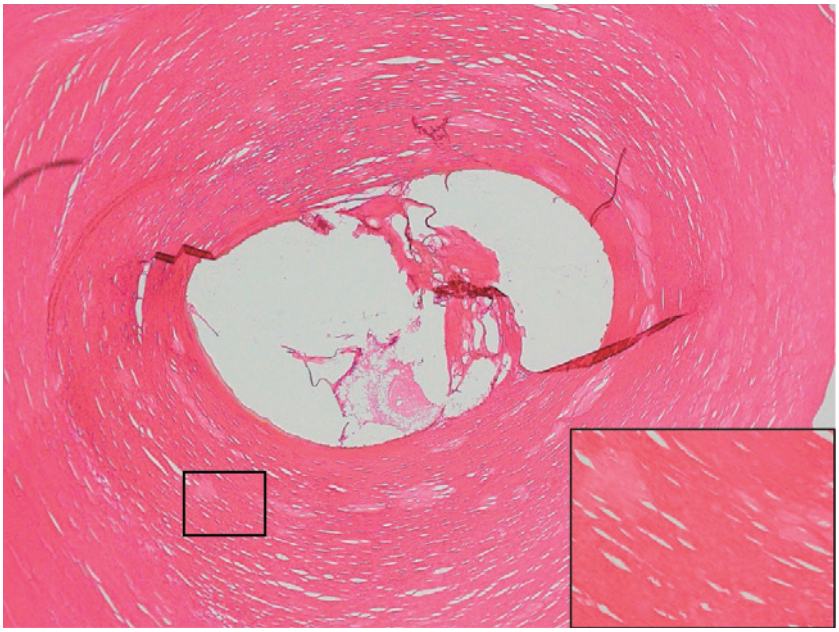

Fig. 5 Histopathological examination revealed an eosin-stained vitrified fibrous material composed of layered tissue; some fine-grained calcification was observed (magnification ×40, inset ×400).

Discussion

PLB is rare and usually found incidentally during laparotomy, examination, or autopsy[1]. The detailed pathogenesis is unclear; however, PLBs are believed to originate when epiploic appendices released into the abdominal cavity after ischemic necrosis are covered by fibrous tissue[3]. PLBs do not require surgery, except when they produce symptoms such as abdominal pain, bowel obstruction, urinary retention, and frequent urination, when they are large, or when malignancy is suspected. PLBs are usually small (diameter, 0.5-2.5 cm) but may reach a diameter of 5-10 cm, at which point they are classified as "giant" or "huge" peritoneal bodies[2,4]. A literature search for "giant peritoneal loose bodies" identified 29 patients, including ours. The clinical features of previously described patients with PLBs are summarized in **Table 1**. Only in our patient did the PLB exist outside the peritoneum, and only in a few cases were PLBs fixed. Both these conditions are rare, as most PLBs are present in the abdominal cavity; thus, there may be a mechanism for

Table 1

Author	Published year	Gender	Age	Size of PLB (mm)	Location	PLB mobility	Surgical procedure
Takada A	1998	M	79	70	douglas pouch	free	Open
Nomura H	2003	M	63	50	pelvic cavity	free	Laparoscopy
Ghosh P	2006	M	63	58	peritoneal cavity	attached to the bladder and sigomoid colon	Open
Mohri T	2007	M	73	95	ND	ND	Open
Hedawoo JB	2010	M	65	95	right iliac fossa	ND	Open
Sewkani A	2011	M	64	70	left pelvic wall	attached to omentum	Open
Jang JT	2012	M	60	45	intrapelvic cavity	free	Laparoscopy
Kim HS	2013	M	50	75	pelvic cavity	free	Laparoscopy
Rubinkiewicz M	2014	F	70	200	peritoneal cavity	free	Open
Makineni H	2014	M	52	60	recto-vesical pouch	ND	Open
Sahadev R	2014	M	52	70	intra-peritoneum	free	Laparoscopy
Zhang H	2015	M	51	50	pelvic cavity	free	Laparoscopy
Sussman R	2015	M	52	100	ND	free	Laparoscopy
Suganuma I	2015	F	35	75	ND	connected to the uterus via a pedicle	Laparoscopy
Lee KH	2016	F	61	60	leftadnexal area	free	Laparoscopy
Elsner A	2016	M	52	52	lesser pelvis	free	Laparoscopy
Rosic T	2016	M	73	66	pelvis	free	Laparoscopy
Huang Q	2017	M	79	104, 76	vicinity of the spleen, pelvic cavity	free	Laparoscopy
Matsubara K	2017	M	70	58	pelvic cavity, between the rectum and the urinary bladder	free	Laparoscopy
Oom R	2018	M	64	60	pelvic cavity	free	Laparoscopy
Cojocari N	2018	M	72	65	recto-vesical pouch	ND	Laparoscopy
Obaid M	2018	M	58	60	pelvic cavity	free	Laparoscopy
Guo S	2019	M	49	55	ND	ND	Open
Baert L	2019	M	53	55	right iliac fossa	free	Laparoscopy
Teklewold B	2019	M	50	75	right paracolic gutter	adhesion to bowl	Laparoscopy
Li R	2020	M	46	45	pelvic cavity	free	Laparoscopy
Dhoot NM	2020	M	75	62	pelvic cavity	free	Laparoscopy
Allopi N	2021	M	79	45	pelvic cavity	free	Laparoscopy
our case	2021	M	83	60	rectovesical excavation	fixed at extraperitoneal	Laparoscopy

the pathogenesis of PLB that differs from the one described above.

To perform minimally invasive surgery, it is important to have a preoperative diagnosis. After careful examination, our patient was suspected of having PLB preoperatively, although the mass could not be confirmed as extraperitoneal. We performed laparoscopic surgery, which reduced surgical invasiveness. Furthermore, the patient did not require intestinal resection. However, it is difficult to distinguish PLBs from other mobile lesions of the pelvic cavity, such as calcified uterine leiomyomas, peritoneal calcifying fibrous pseudotumors, foreign body granulomas, desmoid tumors, teratomas, metastatic lesions of ovarian cancer, spontaneously amputated ovaries, fecaliths, lymphatic glands in the mesentery, nodal calcifications, tuberculosis, urinary stones, and gallstones[2]. To ensure accurate diagnosis, it is important to think comprehensively and keep in mind this rare condition. Imaging studies are also helpful. Radiographs show a calcified lesion in the abdomen, which moves as the position of the patient changes; a high index of suspicion is needed for the diagnosis of a giant PLB. However,

there are exceptions, as in our patient. Other tests that can help diagnose PLB include CT and MRI scans, which can be useful in differentiating PLB from other lesions[5]. PLBs are characteristically well-defined ovoid or spherical soft-tissue masses with central calcification, and are usually located in the abdomen and surrounded by distinct fat planes that separate them from adjacent organs[4]. The MRI signal is similar to that of muscle, and a central hyperintense area may be present on T1-weighted images. PLBs do not exhibit enhancement; this is useful in differential diagnosis, as leiomyomas and teratomas exhibit contrast enhancement[6].

Conclusion

A fixed giant PLB outside the peritoneum near the rectovesical excavation was removed by laparoscopy. Giant PLBs are rare, and PLBs outside the peritoneum are even rarer. It is important to be aware of this condition and its characteristic features, so as to establish an accurate diagnosis. Accurate diagnosis of a giant PLB is likely to reduce unnecessary surgical treatments for asymptomatic patients, for whom the finding is incidental.

Conflict of Interest: The authors declare no conflicts of interest. This study received no external funding.

References

1. 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 Jul;28(7):441−2.
2. Kim HS, Sung JY, Park WS, Kim YW. A giant peritoneal loose body. Korean J Pathol. 2013 Aug;47(4):378−82.
3. Ghahremani GG, White EM, Hoff FL, Gore RM, Miller JW, Christ ML. Appendices epiploicae of the colon: radiologic and pathologic features. Radiographics. 1992 Jan;12 (1):59−77.
4. Gayer G, Petrovitch I. CT diagnosis of a large peritoneal loose body: a case report and review of the literature. Br J Radiol. 2011 Apr;84(1000):e83−5.
5. 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 Rep. 2011 Jul 7;5:297.
6. Nomura H, Hata F, Yasoshima T, et al. Giant peritoneal loose body in the pelvic cavity: report of a case. Surg Today. 2003;33(10):791−3.
7. 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 May-Jun;40(5):427−30.
8. Mohri T, Kato T, Suzuki H. A giant peritoneal loose body: report of a case. Am Surg. 2007 Sep;73(9):895−6.
9. Hedawoo JB, Wagh A. Giant peritoneal loose body in a patient with haemorrhoids. Trop Gastroenterol. 2010 Apr-Jun;31(2):132−3.
10. Jang JT, Kang HJ, Yoon JY, Yoon SG. Giant peritoneal loose body in the pelvic cavity. J Korean Soc Coloproctol. 2012 Apr;28(2):108−10.
11. Rubinkiewicz M, Kenig J, Zbierska K, Lasek A. Autoamputated leiomyoma of the uterus as a rare cause of the mechanical bowel obstruction - report of a case. Pol Przegl Chir. 2014 Jul;86(7):341−4.
12. Makineni H, Thejeswi P, Prabhu S, Bhat RR. Giant peritoneal loose body: a case report and review of literature. J Clin Diagn Res. 2014 Jan;8(1):187−8.
13. Sahadev R, Nagappa PK. A case of peritoneal free floating calcified fibromyoma. J Clin Diagn Res. 2014 May;8 (5):ND03−4.
14. Zhang H, Ling YZ, Cui MM, Xia ZX, Feng Y, Chen CS. Giant peritoneal loose body in the pelvic cavity confirmed by laparoscopic exploration: a case report and review of the literature. World J Surg Oncol. 2015 Mar 24; 13:118.
15. Sussman R, Murdock J. Images in clinical medicine. Peritoneal loose body. N Engl J Med. 2015 Apr 2;372(14):1359.
16. Suganuma I, Mori T, Takahara T, et al. Autoamputation of a pedunculated, subserosal uterine leiomyoma presenting as a giant peritoneal loose body. Arch Gynecol Obstet. 2015 Apr;291(4):951−3.
17. Lee KH, Song MJ, Park EK. Giant peritoneal loose body formation due to adnexal torsion. J Minim Invasive Gynecol. 2017 Feb;24(2):189.
18. Elsner A, Walensi M, Fuenfschilling M, Rosenberg R, Mechera R. Symptomatic giant peritoneal loose body in the pelvic cavity: A case report. Int J Surg Case Rep. 2016; 21:32−5.
19. Rosic T, Khumalo V, Nethathe DG. A pelvic "loose" body tumour causing urinary symptoms in a 73-year-old man. S Afr J Surg. 2016 Jun;54(2):53−4.
20. Huang Q, Cao A, Ma J, Wang Z, Dong J. Two giant peritoneal loose bodies were simultaneously found in one patient: A case report and review of the literature. Int J Surg Case Rep. 2017;36:74−7.
21. Matsubara K, Takakura Y, Urushihara T, Nishisaka T, Itamoto T. Laparoscopic extraction of a giant peritoneal loose body: Case report and review of literature. Int J Surg Case Rep. 2017;39:188−91.
22. Oom R, Cunha C, Guedes VM, Feria LP, Maio R. Corpo Peritoneal Livre Gigante: Caso Clínico e Revisão da Literatura [Giant Peritoneal Loose Body: Case Report and Review of Literature]. Acta Med Port. 2018 May 30;31(5): 272−6. Portuguese.
23. Cojocari N, David L. Giant peritoneal loose body in a patient with end-stage renal disease. SAGE Open Med Case Rep. 2018 Apr 25;6:2050313X18770936.
24. 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 Jul 21;19:854−7.
25. Guo S, Yuan H, Xu Y, Chen P, Zong L. Giant peritoneal loose body: A case report. Biomed Rep. 2019 Jun;10(6): 351−3.
26. Baert L, De Coninck S, Baertsoen C, Lissens P, Djoa L. Giant peritoneal loose body: A case report and review of the literature. Acta Gastroenterol Belg. 2019 Jul-Sep;82(3): 441−3.
27. Teklewold B, Kehaliw A, Teka M, Berhane B. A giant egg-like symptomatic loose body in the peritoneal cavity: A case report. Ethiop J Health Sci. 2019 Nov;29(6):779−82.
28. Li R, Wan Z, Li H. Exploratory laparoscopy as first choice procedure for the diagnosis of giant peritoneal loose

body: a case report. J Int Med Res. 2020 Oct;48(10): 300060520954714.
29. Dhoot NM, Afzalpurkar S, Goenka U, et al. A rare peritoneal egg: Case report with literature review. Radiol Case Rep. 2020 Aug 18;15(10):1895–900.
30. Allopi N, Fataar A, Kimmie F. Giant peritoneal loose body: an instance of incidentaloma or warranted concern? S Afr J Surg. 2021 Mar;59(1):29a–b.

(Received, September 19, 2021)
(Accepted, November 22, 2021)
(J-STAGE Advance Publication, January 25, 2022)