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Case Report

A rare peritoneal egg: Case report with literature review ☆☆☆★

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ABSTRACT

The occurrence of peritoneal loose bodies has been known for hundreds of years. Although rarely, they attain a diameter of more than 5 cm and are then named “giant” peritoneal bodies (gPLBs). Even these huge peritoneal bodies are generally symptom free, but may be linked with chronic symptoms like abdominal pain or discomfort. Many a times, these gPLBs are misinterpreted as intraabdominal tumors or foreign bodies and unnecessary surgical interventions are carried out. We report a rare case of a 75-year-old male, who presented to our tertiary care center emergency department with history of chronic intermittent abdominal discomfort with acute diarrhea and peri-anal pain. Contrast enhanced computed tomography of the abdomen and pelvis revealed round to oval mass in the pelvis measuring 6.2 cm × 5.8 cm. On laparoscopy, a hard, free floating object with the appearance of a boiled egg could just be scooped out from the pelvis. The postoperative pathological examination revealed laminated strands of hyalinized fibro collagenous tissue with central fat necrosis confirming the diagnosis of gPLB. Postoperative period was uneventful. Peritoneal bodies are rare intraabdominal bodies which are either detected incidentally or present with vague symptoms and require interdisciplinary management.

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Introduction

Peritoneal loose body (PLBs) or peritoneal egg, which is an intraabdominal loose body was initially thought to be detected mainly incidentally during routine abdominal imaging or accidentally during surgery or autopsy [1]. Recent literature does depict that patients may present with symptoms depending on the site of the loose body in relationship to surrounding organs. The occurrence of PLB has been known for hundreds of years, but it is rare for them to attain a diameter more than 5 cm, and these are then named “giant” peritoneal bodies (gPLBs) [2–4]. Even these huge peritoneal bodies are generally symptom free, but may be linked with chronic symptoms like abdominal pain or discomfort [5]. Sometimes, due to extrinsic compression patients may present as intestinal obstruction or urinary retention [6,7].

Many a times, these gPLBs are misinterpreted as intraabdominal tumors or foreign bodies and unnecessary surgical interventions are carried out [8]. However, surgical exploration may become imperative for definite diagnosis and treatment in some instances [9].

Case presentation

A 75-year-old male patient presented with acute exacerbation of chronic abdominal pain and acute diarrhea to our tertiary care center emergency department. Patient had a history of chronic intermittent abdominal discomfort with varied localizations for many years. He developed sudden increase in pain abdomen which was localized to lower abdomen, dull aching type, nonradiating, which had worsened in last 48 hours. In the past he had concomitant hepatic steatosis and systemic arterial hypertension. A robotic right nephro-ureterectomy was performed on the patient for transitional cell carcinoma two months prior.

On examination his heart rate was 80 beats/min, blood pressure of 110/80 mmHg and temperature of 36.7 °C. The postoperative scar (of nephron-ureterectomy) was healthy. There was no sign of incisional hernia. On palpation, the lower abdomen was tender with no guarding or rigidity. No mass could be palpated. Other systemic examination was normal. Blood investigations were within normal limits except high white blood count of 14,000/cumm with predominant neutrophils (75%) and C-reactive protein of 14 mg/dL (elevated). Chest X-ray, urine analysis and electrocardiogram were essentially within normal limits. The patient was admitted with a suspicion of proctocolitis. An empirical antibiotic therapy with ceftriaxone was initiated along with other supportive medications.

He was subjected to abdominal imaging to determine the cause for his above symptoms. Conventional abdominal X-ray was unremarkable. The CECT of the abdomen and pelvis were performed and revealed diffusely edematous thickened wall of the rectum and sigmoid colon as well as a well-defined round to oval mass in the pelvis (Fig. 1a, b and c). The mass measured 6.2 cm × 5.8 cm and showed a central high density and peripheral soft tissue density. There was no demonstrable

enhancement on post contrast study. The mass was seen abutting the inflamed rectum with focal loss of fat plane, while the fat planes with urinary bladder and prostate were maintained. Rest of the abdominal organs were unremarkable except for fatty liver and operated right kidney. With a given history of previous nephro-ureterectomy a provisional differential diagnosis of iatrogenic foreign body causing procto-colitis was considered. A possibility of benign pelvic tumor abutting or arising exophytically from rectum was also considered. Meanwhile, colonoscopy revealed proctitis with no evidence of a tumor or chronic inflammatory bowel disease. Patient's general condition improved significantly with antibiotic therapy. However, the abdominal discomfort persisted. Multidisciplinary opinion was taken during the course of hospitalization and it was concluded that the symptoms of the patient were mainly due to the extraluminal mass which was compressing the recto-sigmoid region, causing inflammation and pain abdomen. A decision to perform a laparoscopy and removal of the peritoneal foreign body was therefore taken, for relieving his persistent abdominal discomfort.

On laparoscopy, a hard, oval object with the appearance of a boiled egg was easily scooped out from the pelvis (Fig. 2a). It was free floating without any fixity or adherence to the rectum or any other surrounding organ. Cross-section of the hard oval object resembled a cut boiled egg with yolk at the center surrounded by egg white (Fig. 2b). A PET (positron emission tomography) CT performed before the surgery was traced retrospectively. It revealed the same mass in the pelvis, with long axis vertically oriented in the PET CT, as compared to being horizontally oriented long axis on the recent CECT (contrast-enhanced computed tomography), conforming to the mobile nature of the gPLB. The lesion was Non-FDG (fluorodeoxyglucose) avid with SUV of 1.2 (Fig. 3a and b). The histopathological examination of the specimen (Fig. 4) revealed laminated strands of hyalinized fibro-collagenous tissue with central fat necrosis confirming the diagnosis of gPLB. The postoperative course was uneventful and his pain gradually subsided. The patient was discharged from the hospital after 3 days in an asymptomatic state. On follow-up after 15 days patient was completely asymptomatic and continued to do so even up to upto 4 months of follow-up, with no residual/recurrent abdominal discomfort.

Discussion

A peritoneal mouse also referred to as a PLB is a rare entity [10]. Littre first described it in 1703. It has been proposed that torsion and inflammation cause the detachment of appendices epiploicae. It is also proposed that PLB results from a spontaneously infarcted and consequently distorted and detached epiploic appendix acting as a nidus, undergoing calcification and saponification over the years [11]. Similar process of spontaneous detachment of parts of the greater omentum [1] or the adnexa [12] are considered to act as a nidus well. The deposition of intraabdominal fluids on its surface and its interaction with the surrounding peritoneum are supposed to cause the characteristic histopathological structure of the PLB [13]. In our case, a calcified central piece of fat tissue with an outer

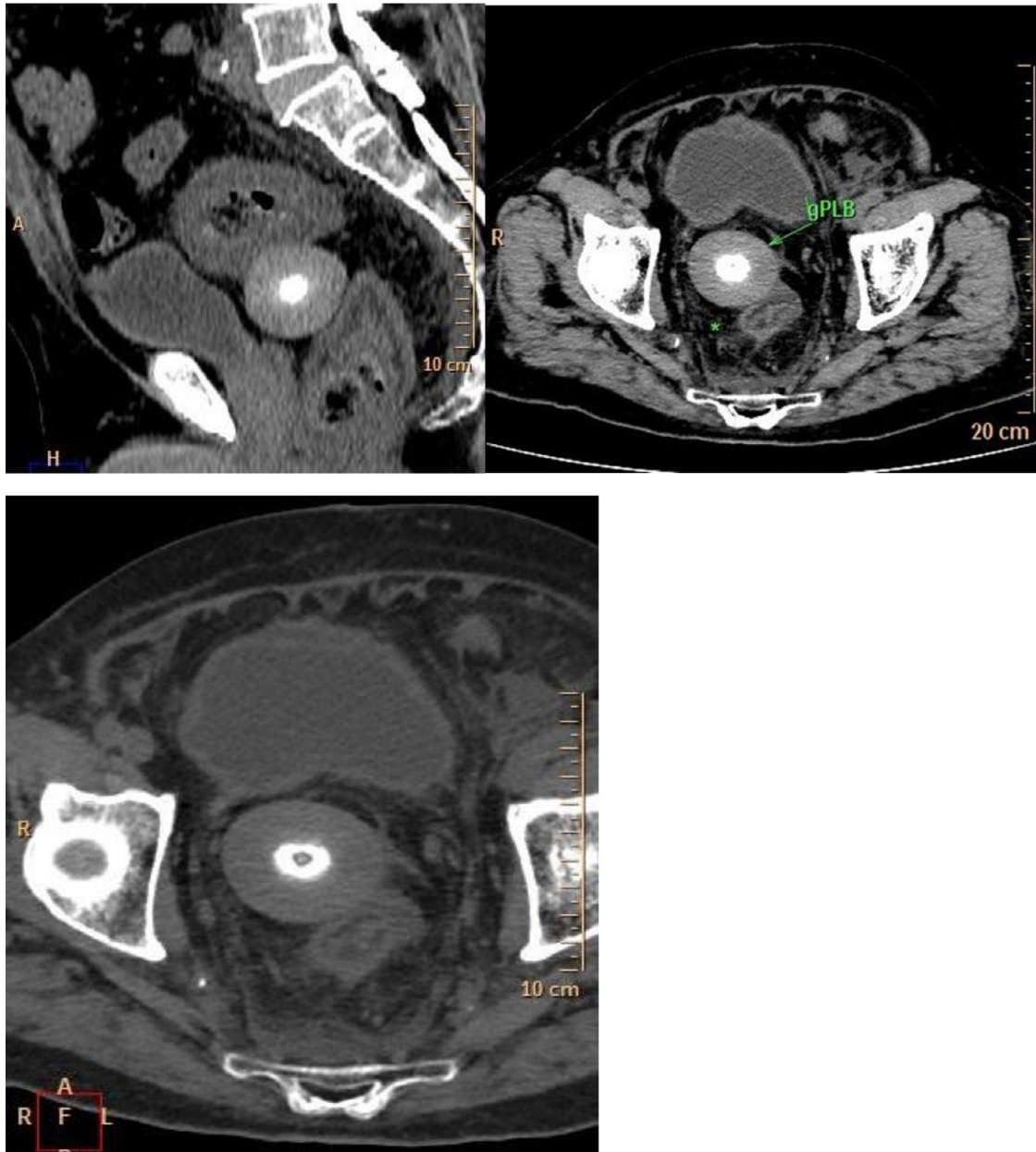


Fig. 1 – CT scan of abdomen (a showing Sagittal plane, b showing Axial plane and c showing Bone window of the lesion): revealing diffusely edematous, thickened wall of the rectum and sigmoid colon abutting a well-defined round to oval mass in the pelvis, measuring 6.2 cm x 5.8 cm, with a central high calcific density with surrounding thick mantle of soft tissue density. There was no demonstrable enhancement on post contrast study.

concentrically organized fibrosis, consisting of multiple layers was demonstrated.

The imaging appearance of PLB is seen as round or oval centrally calcified lesion on plain films. Its mobile feature has also been revealed on plain abdominal conventional films taken serially [1,14–17]. CECT mainly shows a centrally calcified mass with homogenous non enhancing peripheral well defined concentric soft tissue as in our case. PLB has variable size and is generally a single mass as in our case, however multiple gPLBs have also been reported [6,18]. The mobile nature of the lesion can be established on prone CT sections

or by comparing with studies done at different times, as in our case. On magnetic resonance imaging, the PLB generally is a well circumscribed, round to oval hypointense mass on both T1- and T2-weighted images. However, it may exhibit central hyperintensity on T1-weighted images due to calcification [19,20]. The absence of blood supply is responsible for nonenhancing characteristic of PLB.

A PLB has a typical boiled egg, or a huge pearl or a white billiard ball like appearance at surgery. It is free, detached and can be effortlessly scooped out, as was in our case, because it is non adherent to the abdominal organs or peritoneum [8].



Fig. 2 – Hard object obtained at laparoscopy resembling a boiled egg (a); after sectioning, it resembled a cut egg with the central yolk surrounded by egg white (b).

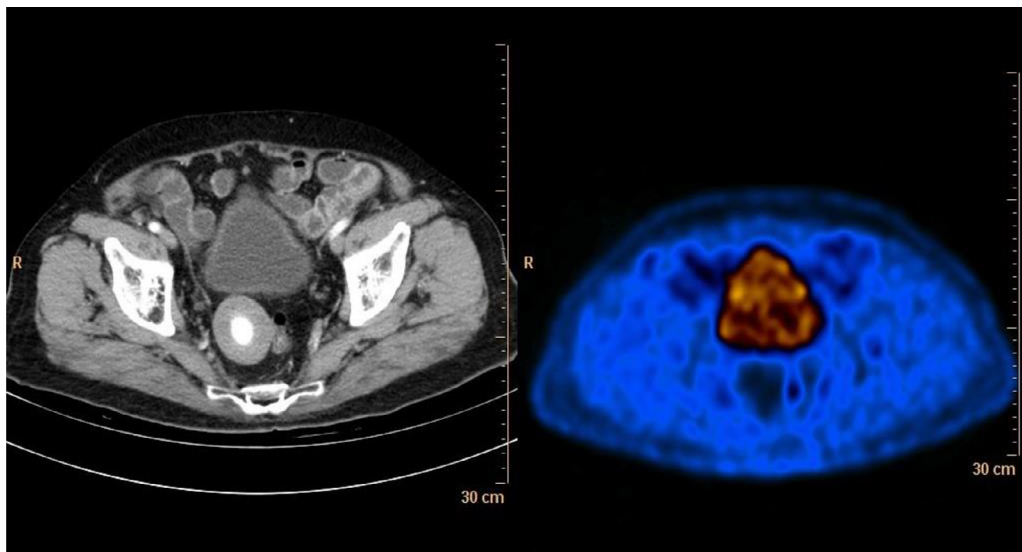


Fig. 3 – PET-CT of abdomen shows similar well-defined round to oval mass in the pelvis with absence of inflammation and normal wall of the rectum and sigmoid colon (a); PET CT fusion image shows absence of any FDG uptake (b).

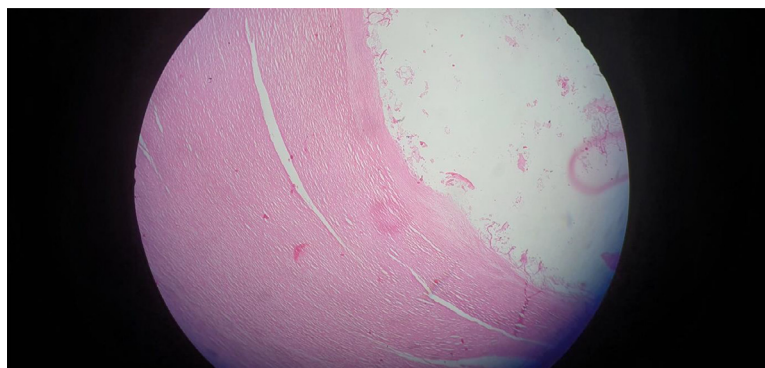


Fig. 4 – Histopathological examination of specimen showed laminated strands of hyalinized fibro-collagenous tissue with central fat necrosis with no evidence of malignancy, confirming the diagnosis of gPLB.

Clinically, the gPLB can be asymptomatic and an accidental finding but can occasionally present with acute as well as chronic symptoms [5–7] as in our case. Among the previously reported cases, majority were men with mean age of 56.3 years (2 months to 79 years) and most commonly they presented with symptoms of pain abdomen and/or urinary frequency [5–15,19–35]. The mean size of loose body is 6.26 centimeter (range, 2.5–10.4 cm) [5–15,19–35]. The symptoms were attributed to the location of the loose body. Among the reported symptomatic cases, the mean duration between symptom onset and diagnosis of peritoneal egg was 814 days (range, 3 days to 20 years). In asymptomatic cases gPLBs were either detected during routine health checkups or accidentally during evaluation of some other diseases and the most common location was pouch of Douglas followed by pelvic cavity. A surgical intervention is not always called for. Defining its imaging characteristics and distinguishing it from intra-abdominal tumors, tubercular granuloma [2] or foreign bodies (as in our case) is important. Repeated radiological investigations and comparison with multiple imaging, preferably in different positions, can establish the diagnosis and the mobile nature of the lesion beyond doubt [2,18].

Our patient had 2 probable reasons for his abdominal symptoms at the same time, proctitis and/or the gPLB. Treatment of proctitis did relieve his symptoms to some extent, but abdominal discomfort and vague pain persisted and these persistent and chronic abdominal symptoms resolved following his surgery.

In a case of an accidentally detected unknown mass, it is crucial to be aware of the rare occurrence of PLB. A thorough clinical history, comparison with previous imaging and knowledge of characteristic imaging details are essential. If the patient is asymptomatic, surgical intervention can be avoided in the scenario of unmistakable radiological diagnosis of PLB. However, a symptomatic patient can be cured after surgery.

Conclusion

Peritoneal loose bodies are rare intraabdominal bodies which require interdisciplinary management compounded with an accurate diagnosis by an experienced radiologist. Based on the correct diagnosis and symptomatology, the suitable choice between surgical or conservative management should be offered.

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] Makineni H, Thejeswi P, Prabhu S, Bhat RR. Giant peritoneal loose body: a case report and review of literature. *J Clin Diagn Res* 2014;8:187–8.
- [3] Hunt VC. Torsion of appendices epiploicae. *Ann Surg* 1919;69:31–46.
- [4] 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;5:297.
- [5] 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;13:118.
- [6] Ghosh P, Strong C, Naugler W, Haghghi 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.
- [7] 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.
- [8] Gayer G, Petrovitch I. CT diagnosis of a large peritoneal loose body: a case report and review of the literature. *Br J Radiol* 2011;84:83–5.
- [9] 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.
- [10] Kim HS, Sung JY, Park WS, Kim YW. A giant peritoneal loose body. *Korean J. Pathol.* 2013;47:378–82.
- [11] Desai HP, Tripodi J, Gold BM, Burakoff R. Infarction of an epiploic appendage: review of the literature. *J Clin Gastroenterol* 1993;16:323–5.
- [12] Koga K, Hiroi H, Osuga Y, Nagai M, Yano T, Taketani Y. Autoamputated adnexa presents as a peritoneal loose body. *Fertil. Steril.* 2010;93:967–8.
- [13] 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.
- [14] Barden AC. Calcified epiploic appendage: a radiologic curiosity. *Radiology* 1939;33:768–9.
- [15] Borg SA, Whitehouse GH, Griffiths GJ. A mobile calcified amputated appendix epiploica. *Am J Roentgenol* 1976;127:349–50.
- [16] Holt JF, MacIntyre AS. Calcified omental fat deposits; their roentgenologic significance. *Am J Roentgenol* 1958;60:612–16.
- [17] Morales O. Calcified appendices epiploicae as freely mobile bodies in the abdominal cavity. *Acta Radiology* 1944;25:653–61.
- [18] 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.
- [19] 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.
- [20] 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.
- [21] Jang JT, Kang HJ, Yoon JY, Yoon SG. Giant peritoneal loose body in the pelvic cavity. *J Korean Soc Coloproctol* 2012;28:108–10.
- [22] Prasath XS. A case report of giant peritoneal loose bodies. *Univ J Surg Surg Special* 2019;5(9):12–13.
- [23] Ilyas M, Wani MY, Dar MA, Shaheen FA. Giant mobile intraperitoneal loose body. *Am J Case Rep* 2019;6(1):e00006.
- [24] 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.
- [25] 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.
- [26] 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;54(2):53–4.
- [27] Lee KH, Song MJ, Park EK. Giant peritoneal loose body formation due to adnexal torsion. *J Minim Invasive Gynecol* 2017;24(2):189.

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- [28] Sussman R, Murdock J. Images in clinical medicine. Peritoneal loose body. *N Engl J Med* 2015;372(14):1359.
- [29] Sahadev R, Nagappa PK. A case of peritoneal free floating calcified fibromyoma. *J Clin Diagn Res* 2014;8(5):03–4.
- [30] Hedawoo JB, Wagh A. Giant peritoneal loose body in a patient with haemorrhoids. *Trop Gastroenterol* 2010;31(2):132–3.
- [31] Mohri T, Kato T, Suzuki H. A giant peritoneal loose body: report of a case. *Am Surg* 2007;73(9):895–6.
- [32] Asabe K, Maekawa T, Yamashita Y, Shirakusa T. Endoscopic extraction of a peritoneal loose body: a case report of an infant. *Pediatr Surg Int* 2004;21(5):388–9.
- [33] Shepherd JA. Peritoneal loose body causing acute retention of urine. *Br J Surg* 1951;39(154):185–7.
- [34] Sukanuma I, Mori T, Takahara T, Torii H, Fujishiro M, Kihira T, et al. Autoamputation of a pedunculated: subserosal uterine leiomyoma presenting as a giant peritoneal loose body. *Arch Gynecol Obstet* 2015;291(4):951–3.
- [35] 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;86(7):341–4.