



## Case Report

# The mystery of free-floating peritoneal loose body: An incidental intraoperative finding in a case of hernioplasty

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## Abstract

**Background:** Peritoneal loose body (PLBs) is an unusual presentation occurring as a free-floating mass in the peritoneal cavity. They remain asymptomatic for longer periods but may produce vague abdominal pain on occasion. They are generally an incidental finding during imaging studies, surgery or autopsies. It can occur due to torsion, infarction and saponification of large appendices epiploicae leading to its auto-amputation that freely floats in the peritoneal cavity.

**Case Report:** We report a case of a 53-year-old lady who presented with complaints of lower abdominal pain on and off for the past 3 months with a prior history of surgeries. On examination, she had mild tenderness in the left lumbar and lower abdomen with no guarding or rigidity. Ultrasound of the abdomen and pelvis revealed a posterior rectus sheath hernia. She was planned for hernial repair. Intraoperatively, when the peritoneal cavity was explored, a small greyish-white nodule was found floating within the cavity and was free of attachments. Gross examination revealed a firm to hard, greyish yellow, ovoid, glistening nodular mass that was gritty on slicing with the cut surface showing central necrosis and calcification. Histopathological examination revealed a well-circumscribed nodule with dense collagenous tissue at the periphery with central necrotic debris and cholesterol clefts undergoing calcification.

**Conclusion:** PLBs are rare, benign asymptomatic intraperitoneal lesions found incidentally. Preoperative diagnosis of PLBs is difficult and can mimic features of a malignant tumour making its diagnosis challengeable for the surgeons. Hence, it is necessary to differentiate PLBs from neoplastic or metastatic lesions by Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) in different positions and by pathological examination.

**Keywords:** Peritoneal loose body, Appendices epiploicae, Hernioplasty, Calcifying fibrous Pseudotumour, Peritoneal mice.

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## 1. Introduction

Peritoneal loose bodies (PLBs) are rare, asymptomatic benign lesions found incidentally during laparotomy, imaging or autopsy.<sup>1-4</sup> They are generally less than 1cm in size. However, giant PLBs (> 5 cm) are reported in the literature in rare instances.<sup>5,6</sup> They require specific treatment when symptoms due to extrinsic compression arise.<sup>1,2,6</sup> PLBs are commonly observed in men between 40 to 70 years.<sup>1,6,9</sup>

The exact pathogenesis of the occurrence of PLBs is unknown. These bodies are believed to occur as a result of torsion resulting in chronic infarction/thrombosis of the central draining vein, saponification and calcification.<sup>5,9-11</sup> PLBs increase in size due to the accumulation of albumin from exudative peritoneal fluid.<sup>2</sup>

Imaging studies like USG, CT and MRI in different positions is useful in assessing the mobility of PLBs. The definitive diagnosis and treatment depend upon surgical exploration and postoperative histopathological examination.<sup>2,10</sup> It can be easily misdiagnosed as calcified uterine leiomyomas, rhabdomyomas, fecaliths, peritoneal calcifying fibrous pseudotumours, teratomas, desmoid tumours, spontaneously amputated ovaries, metastatic lesions of ovarian cancer, mesenteric lymph node enlargement and calcifications, echinococcal cysts, appendicitis, tuberculosis, gallstones, urinary stones.<sup>1,2,4,7,12</sup> Surgical removal either by open laparotomy or laparoscopic approach along with histopathological examination helps in confirming the diagnosis of PLBs.

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## 2. Case Report

A 53-year-old lady, presented to the General Surgery Department with complaints of lower abdominal pain that was continuous and dragging type for the past 3 months. She also gives a history of lifting heavy weights. She underwent tubal sterilization and total abdominal hysterectomy years ago. On examination, she had tenderness in the left lumbar and lower abdomen. However, there was no guarding or rigidity. She was a known diabetic and hypertensive on treatment. Ultrasound of the abdomen revealed a herniation through the posterior rectus sheath. She was planned for hernioplasty. Intraoperatively, when the peritoneal cavity was explored, a small greyish-white, glistening nodule was found floating within the cavity and was free of attachments. (**Figure 1**) The nodule was extracted and sent for histopathological examination.

Gross examination revealed an ovoid mass that was firm to hard, white to pale yellow, glistening and egg-shaped mass measuring 1.2x1x0.4cm. The mass was gritty on slicing. The cut surface of the mass showed an ill-defined lesion towards one end consisting of necrotic creamy material with surrounding hard grey-white concretions (? calcification) measuring 0.8x0.7cm. Rest other areas appeared grey white and glistening. (**Figure 2**)

Histopathological examination of the excised mass showed a well-circumscribed nodule composed of dense collagenous tissue at the periphery and central necrotic debris with cholesterol clefts and extensive calcification. (**Figure 3**) The calcific deposits were seen within the fibrous tissue as well. Peripheral fibrous tissue showed lymphocytic infiltrate at foci.

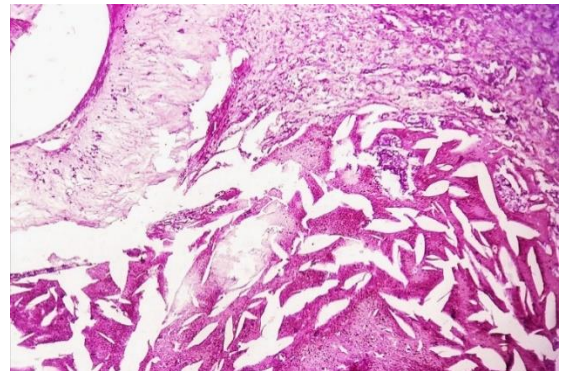
Hence, we reported this case as a peritoneal loose body.



**Figure 1:** Intra operative image of a peritoneal loose body lying free in the peritoneal cavity



**Figure 2:** Gross image showing an egg shaped mass with central necrosis surrounded by calcification



**Figure 3:** Photomicrograph showing central necrotic area with cholesterol clefts and extensive calcification surrounded by dense collagenous tissue at the periphery

## 3. Discussion

Peritoneal loose bodies are very rare intraperitoneal bodies that are usually asymptomatic. They are also referred to as peritoneal mice.<sup>3,5-7,10</sup> Littre reported the first case of PLBs in 1703.<sup>6</sup> In the year 1917, Harrigan, in a case series initially documented PLBs involving the epiploic appendages.<sup>13</sup> PLBs are usually small, less than 1cm in size and are pale grey to pearly white, with smooth glistening surface and a characteristic “Boiled Egg” appearance. However, their size varies in different individuals, sometimes exceeding 5cm, referred to as “Giant” forms.<sup>2,6,7</sup> These giant forms are extremely rare in presentation, always symptomatic and require a surgical intervention.<sup>2</sup> Many studies suggest that PLBs are more commonly observed in men between 40 to 70 years than females.<sup>1,6-9</sup> Asabe et al reported PLBs in a 2-month-old infant presenting with abdominal pain and urinary retention.<sup>14</sup>

In 2007, Mohri et al reported the largest case of PLBs measuring 9.5cm in a 73-year-old male.<sup>15</sup> Similarly, another case of the same dimension was reported by Hedawoo et al in 2010.<sup>16</sup> On the other hand, Huang et al reported a very rare occurrence of two giant PLBs in the peritoneal cavity of the same patient.<sup>3</sup>

The exact incidence of PLBs is unknown because of its rarity.<sup>1,7</sup> They are incidentally found during imaging studies, surgery or during autopsies. PLBs are generally asymptomatic and often remain undiagnosed making pre-operative diagnosis difficult. However, giant PLBs can cause obstructive symptoms by compressing the nearby viscera

based on the site where they lie.<sup>7,17</sup> They are often freely suspended in the peritoneal cavity and tend to localise in the dependent parts like the pelvic cavity.<sup>4</sup> External compression of the genitourinary and gastrointestinal tract by giant PLBs in rare instances can lead to acute urinary retention and intestinal obstruction.<sup>1,4,7</sup>

Studies suggest that PLBs occur as a result of chronic torsion and auto-amputation of appendices epiploicae (AE) within the peritoneal cavity.<sup>5,9-11,17,18</sup> AE are subserosal fat protrusions that are lined by peritoneum and are about 50-100 in number. They are about 2-5cm long and 1-2cm thick, arising from the serosal surface of the large bowel. They are attached to the anti-mesenteric border of the colon with a thin pedicle. They can be visualised by ultrasound and CT. Grahamani et al studied various pathologies of AE in 36 cases, out of which 22 cases were found to have spontaneous torsion, infarct and calcification.<sup>18</sup>

The exact sequence that happens in AE to become a PLBs is torsion resulting in chronic infarction/thrombosis of central draining vein, saponification and calcification. The shredded infarcted AE immerses in the peritoneal fluid that is protein rich, especially albumin. This albumin accumulates around AE leading to of fibrous layer formation peripherally.<sup>1,5,7,17,18</sup> A study by Jang et al revealed inflammation can result in torsion, strangulation and necrosis of AE as a result of intestinal obstruction/perforation, volvulus and intra-abdominal adhesion.<sup>12</sup> Huang et al suggested that PLBs can also be an auto-amputated part of the greater omentum, adnexa or pancreatic adipose tissue.<sup>3</sup>

PLBs tend to change their position often. Hence, repeated imaging at various positions is needed to arrive at the diagnosis. PLBs can be considered if there is movement of the mass with change in position.<sup>3,6,8,12</sup> Ultrasound, MRI and CT is useful in diagnosing PLBs. The CT findings of PLBs include a small hypodense centre with by a calcified shell surrounding it and a hyper-dense proteinaceous material at the periphery.<sup>5</sup> In T1 and T2-weighted MRI scans, PLBs appear as well-circumscribed masses with low-intensity.<sup>7</sup>

Surgical removal either by open laparotomy or laparoscopic approach along with histopathological examination helps in confirming the diagnosis of PLBs.<sup>4</sup> Pathological examinations not only aids in diagnosing PLBs but also helps in differentiating it from other lesions. Gross examination shows a characteristic “Boiled Egg” appearance.<sup>2,5,7</sup> They are generally 0.5 to 2.5cm in size, oval-shaped with pearly white, smooth, glistening surface. Cut surface shows a central yellow zone of fat necrosis, calcification and saponification and outer multiple layers of concentrically organized fibrosis. Histopathological examination shows a central zone of necrotic fatty tissue with surrounding areas of micro-calcifications and an outer densely laminated, hyalinised, acellular fibrous tissue.<sup>2,4</sup>

PLBs lack normal cellular architecture and are predominantly composed of collagen and protein. Sang et al studied the protein composition of PLBs by proteomic analysis. Interestingly, they found that up to 42 proteins were primarily involved in the formation of collagen. One such protein is Asporin which has a key role in promoting PLBs formation. Asporin is highly expressed in omentum and it has the ability to promote binding of collagen to proteins and induce calcification in the collagenous tissue. Also, Laminin and Connective Tissue Growth Factor can induce collagen deposition and network formation. Various collagen isoforms like COL5A2, COL1A1, COL3A1, COL6A3 and COL12A1 also play important roles in collagen deposition and collagen network formation.<sup>8</sup>

It is known that PLBs are intra-abdominal mobile lesions. Hence, it is essential to differentiate it from other intra-abdominal lesions of the peritoneum like calcified uterine leiomyomas, rhabdomyomas, fecaliths, peritoneal calcifying fibrous pseudotumours, teratomas, desmoid tumours, spontaneously amputated ovaries, metastatic lesions of ovarian cancer, mesenteric lymph node enlargement and calcifications, ecchinococcal cysts, appendicitis, tuberculosis, gallstones, urinary stones.<sup>1,2,4,7,12</sup> The diagnosis of PLBs must be considered when there is a lack of communication with any organ, the presence of a clear fat plane, eggshell/popcorn pattern of calcification and lack of enhancement in CT.<sup>7,18</sup>

#### 4. Conclusion

Peritoneal loose body is a rare, asymptomatic benign pathology that appears as an easily mobile, intraperitoneal mass found incidentally during imaging, laparotomy and autopsy. Any symptomatic patient presenting with a mobile, calcified lesion within the peritoneal cavity should raise a suspicion of PLBs. Preoperative diagnosis of PLBs is difficult and can mimic features of a malignant tumour making its diagnosis challengeable for the surgeons. Hence, it is necessary to differentiate PLBs from neoplastic or metastatic lesions. Dynamic imaging modalities such as Ultrasound, CT and MRI in different positions can be useful in assessing their mobility. Symptomatic PLBs can be removed by open or laparoscopic surgery. However, pathological examination is needed for confirmation and to categorise such lesions as PLBs or malignant lesions.

In our case, the patient was a female who presented with complaints of vague lower abdominal pain with prior history of two abdominal surgeries and was currently posted for hernioplasty in whom the loose body was an incidental intraperitoneal finding noted during hernia repair. Only a few studies have suggested the occurrence of PLBs in females as in our case.

#### 5. Source of Funding

None.

## 6. Conflict of Interest

None.

## 7. Consent for Publication

Obtained from the patient for the publication of this case report

## 8. List of Abbreviations

AE: Appendices epiploicae; COL: Collagen; CT: Computed tomography; MRI: Magnetic resonance imaging; PLBs: Peritoneal loose bodies.

## References

1. Ariaya A, Ahmed M, Mindaye ET. Incidental peritoneal loose body in a polytrauma patient: The unnoticed scenario: A case report. *Int J Surg Case Rep.* 2021;85:106158.
2. Guo S, Yuan H, Xu Y, Chen P, Zong L. Giant peritoneal loose body: A case report. *Biomed Rep.* 2019;10(6):351–3.
3. 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.
4. Kim HS, Sung JY, Park WS, Kim YW. A giant peritoneal loose body. *Korean J Pathol.* 2013;47(4):378–82.
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;5:297.
6. Dhoot NM, Afzalpurkar S, Goenka U, Mahendra V, Khan EM, Sutradhar A, et al. A rare peritoneal egg: Case report with literature review. *Radiol Case Rep.* 2020;15(10):1895–900.
7. Mohammed AH, Bezabih NA, Gebresilassie MY, Hailu YA, Semahegn MY, Damtie MY. Unveiling the rarity: A case report of giant peritoneal loose body. *Radiol Case Rep.* 2024;19(11):5492–95.
8. 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.
9. 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;39:188–191.
10. 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.
11. Patel DN, Patel RR, Desai HK, Patel RK. A rare case of peritoneal loose body (mice) in left sided inguinal hernial sac. *Annal Urol Nephrol.* 2020;2(4).
12. 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.
13. Harrigan AH. Torsion and inflammation of the appendices epiploicae. *Ann Surg.* 1917;66(4):467–78.
14. Asabe K, Mackawa T, Yamashita Y, Shirakusa T. Endoscopic extraction of a peritoneal loose body: a case report of an infant. *Pediatr Surg Int.* 2005;21(5):388–9.
15. Mohri T, Kato T, Suzuki H. A giant peritoneal loose body: report of a case. *Am Surg.* 2007;73(9):895–6.
16. Hedawoo JB, Wagh A. Giant peritoneal loose body in a patient with haemorrhoids. *Trop Gastroenterol.* 2010;31(2):132–3.
17. Ansari N, Suryavanshi P, Singh GN, Roy S, Verma S. Rolling egg-shaped peritoneal loose body (plb): a diagnostic dilemma for surgeons and radiologists. *Cureus.* 2022;14(11):e31214.
18. Ghahremani GG, White EM, Hoff FL, Gore RM, Miller JW, Christ ML. Appendices epiploicae of the colon: radiologic and pathologic features. *Radiographics.* 1992;12(1):59–77.

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