

## Two rarities together: A free peritoneal body in a *hernia en pantaloon* sac and case series of our experience of finding loose peritoneal bodies

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### ABSTRACT

Peritoneal loose bodies (PLBs) are rare findings that were reported extensively in the early nineteenth and twentieth century in the form of case series by Littre, Riedel and Macintosh. In the recent past, focus has shifted more towards symptomatic free peritoneal bodies. Although a proper intrabdominal examination and histopathology can help to clear the diagnosis, there is still no consensus in the surgical circle as to how to deal with them. Here, we report a case series of 4 cases of finding loose peritoneal bodies during intra-abdominal procedures, three of them were found during laparoscopic procedures (laparoscopic appendectomy, Robotic mesh rectopexy and laparoscopic bowel resection) while one was an open surgery (open inguinal hernia repair). This paper is unique as for the first time in the history it brings two surgical rarities together i.e. 'hernia en pantaloon' and free peritoneal body along with recommendations based on the literature, review to diagnose and treat loose peritoneal bodies.

**Keywords:** *Appendices epiploic, Peritoneal loose bodies, Peritoneal mouse.*

**F**ree peritoneal bodies are rarely found structures inside the abdomen during open or laparoscopic procedures and during an autopsy. The incidence is not clear from the literature as they are rarely reported. Although extensive work has done to explain the origin of peritoneal free bodies, yet they are still a great source of confusion during diagnosis and treatment. With this case series and review, we have tried to explain their origin and devised guidelines for their management.

### CASE SERIES

We are presenting a case series of finding loose peritoneal bodies during intra-abdominal procedures, three of them were found during laparoscopic procedures (laparoscopic appendectomy, Robotic mesh rectopexy and laparoscopic bowel resection) while one was an open surgery (open inguinal hernia repair). All cases were incidental findings and loose peritoneal bodies were asymptomatic. In this case series, the origin of loose peritoneal bodies was tried to establish and the complications caused by these bodies during diagnostic and treatment were also investigated.

#### CASE 1

A 73-years-old lady presented with central, severe, colicky abdominal pain which later shifted to the right iliac fossa with raised inflammatory markers. Her general examination and other observations were all normal and the vitals were stable. On abdominal examination, she was tender at McBurney's point.

On laparoscopic examination, a small 30x20x10 mm calcific body was spotted in the pouch of Douglas and retrieved with a grasper. Both ovaries were present, the gallbladder was normal and no other intrabdominal pathology. The physical appearance of a loose peritoneal body was of a calcific body, consistency was rubbery and inner core was grey in colour (Figure 1). Histology revealed a nodule composed of adipose tissue surrounded by a thick fibrous capsule. The patient was inquired about any previous symptoms of acute abdomen, but she did not seem to remember any symptoms in the past. The patient had uneventful recovery after surgery.

#### CASE 2

A 69-years-old female with small bowel stricture involving the distal part of ileum with active Crohn's for the last five years and the previous history of intestinal tuberculosis diagnosed when she was very young. On general examination, vitals were stable. She underwent an elective laparoscopic-assisted small bowel resection and Kono-S anastomosis of the small bowel. During exploring the peritoneal cavity, a small loose peritoneal body was found in the right paracolic gutter with a shape of a berry and variegated in colour with grey and yellow stranding. Rest of the intrabdominal organs were normal. The core was soft and consisted of cheesy white material (Figure 2). This specimen was sent for histopathology which was reported as small fibrous body measuring 35x22x10mm with hyalinization and areas of calcification. Origin could not be determined but from the



**Figure 1:** An ovoid free peritoneal body found in case 1



**Figure 2:** Ovoid peritoneal body found in case 2



**Figure 3:** Small (less than 1 cm) free peritoneal body found in case 4

physical appearance and histology, it was assumed either be a calcified lymph node or calcified appendices epiploic. Only relevant history from the past is previous tuberculosis, no acute abdominal pain before diagnosed with Crohn's and no history of fibroids. No previous imaging pointed at a possible calcified body in the abdomen. The patient had an uneventful recovery from surgery.

### CASE 3

An 85-years-old male came to day unit for elective left-sided hernia repair which he had for last two years. General examination and vitals were all normal. Physical examination revealed palpable reducible swelling in the left groin. The patient had never had any trouble with his hernia in the past. When hernia repair was performed, it was found that there were two sacs on either side of inferior epigastric artery constituting the diagnosis of 'Hernia en Pantaloon'. In the indirect component, a small lump of almost the same size of normal testis was felt. Scrotum was examined to confirm normal testicular position. As it was an open repair, intrabdominal structures could not be evaluated. The lump was fully mobile and about 40x32x20mm with a rubbery consistency, grey in colour with yellow strands. Histology showed that loose peritoneal body consisted of homogenous material with an outer core of calcification and islands of calcification in the core. No previous imaging showed any radio-opaque body in the abdomen or pelvis in the past. Only relevant history from the past was old pulmonary tuberculosis and exposure to asbestos. The patient denied any history of acute abdomen. In this case, origin could be either infarcted appendices epiploic or calcified lymph node, although the evidence favours the latter. It is worth to mention that the patient never had any pain with the hernia.

### CASE 4

A 65-years-old female presented for elective robot-assisted mesh rectopexy. General examination revealed no abnormalities. During the laparoscopic examination of the peritoneal cavity, a small free peritoneal body was noticed in the pelvic cavity in retro-vesical space. It was about 1 cm in maximum diameter and was pearly white in colour. It was retrieved. On physical examination, it was found to be soft and cut surface showed cheesy paste-like material inside it (Figure 3). The peritoneal examination was performed to look for an obvious cause but could not be found. The peritoneal body was sent for histopathology. Histopathology is reported as: "a pale-yellow nodule measuring 7x6x3 mm with sections showed an oval piece of peritoneum covered with flattened mesothelial cells with underlying thin fibrous tissue layer and showing cystic degeneration in the rest of the nodule. There were a scattered collection of foamy macrophages, in keeping with fat necrosis". Origin was likely appendices epiploic.

### DISCUSSION

In the literature, the origin of a free peritoneal body is usually associated with appendices epiploic. Appendices epiploic was first explained by Vesalius in 1543 and the loose peritoneal body was first mentioned by Littre in 1703<sup>1</sup>. Though the concept of epiploic appendicitis became clearer in mid-twentieth century, it's possible relationship with the loose peritoneal body was first described by Virchow in 1863.<sup>1</sup>

Harigen in 1917 described a case of infarcted appendices epiploic causing peritonitis and mentioned a list of authors who found free peritoneal bodies<sup>1</sup>. In 1919, Hunt described 42 cases of appendices epiploicae from the literature and 11 cases of finding free peritoneal bodies<sup>2</sup>. A rare case was described by Johnston in

which the patient had a missing ovary and an incidental finding of the free peritoneal body having ovary like cuboidal epithelium<sup>3</sup>. Although most cases hint to their origin to infarcted appendices epiploicae but in rare instances, ovary, Ectopic pregnancies, lymph nodes, faecoliths, stercoliths and pedunculated fibroids can also be implicated.<sup>3</sup>

Free peritoneal bodies, loose peritoneal bodies or peritoneal mice are rarely found intraperitoneally during laparotomy, laparoscopy and autopsy. The incidence of peritoneal loose bodies (PLBs) is not clear in the literature. Sometimes they are wrongly called “foreign bodies”, which is a misnomer as they are not introduced externally inside the abdomen. They are called peritoneal mice because of their mobility inside the abdomen and they keep changing position on imaging. Peritoneal loose bodies are a completely different entity compared to phlebolith and calcified lymph nodes as later are fixed structures. Both types of structures cause confusion during interpreting radiological images. Giant peritoneal bodies more than 5 cm are rare but usually more symptomatic because of their size<sup>4</sup>. They are widely known as “free peritoneal bodies”, “loose peritoneal bodies”, “peritoneal mice” and “boiled egg” due to their appearance. They can attach to intra-abdominal structures and in the literature, such peritoneal bodies are called “parasitized peritoneal bodies”.

Pathophysiology of PLB depends upon its origin. If origin of PLB is appendices epiploic then it is proposed that inflammation or infection of appendices epiploic cause it to become laden with fat and fibrinous material making it heavier which can lead to twisting on the axis of its arterial supply, over days and weeks because of combination of ischaemia and inflammation, it eventually suffers infarction leading it to go loose in abdominal cavity. With time dystrophic calcification and connective tissue degeneration lead to the formation of PLB. As the number of appendices epiploic can vary between 50-100, so finding multiple PLBs is not rare.<sup>5</sup>

There are instances where infarcted ovaries and fallopian tubes were found as PLB<sup>6,7</sup>. In the literature, they were diagnosed by identifying ovary like epithelium and absence of ovary in the patient. Ovarian cysts and pedunculated fibroids can cut off their blood supply, get infarcted and can present as free peritoneal body after degeneration, hyalinization and dystrophic calcification<sup>8</sup>. Loose calcified mesenteric lymph nodes can become loose inside the abdomen with a similar mechanism, although there is little evidence in their favour. In our study, two patients had tuberculosis in the past. So though calcified loose lymph nodes are less likely, they cannot be completely ruled out.<sup>5</sup>

Johnstonin 1928 states that several interesting cases were recorded in the transactions of the Pathological Society of London in addition to those quoted by Hunt. In all, nine specimens of the loose body from the peritoneal cavity were exhibited to this society between 1854 and 1860. The first, exhibited by Mr. Shaw, was from a hernial sac. The patient was operated upon twenty-four hours later after presentation<sup>1</sup>. The loose body, round and about 1.5 inches in diameter, was described as “looking like a hard-boiled egg with the shell removed.” Section of it showed

that what may be called the cortex was as dense as fibro-cartilage, while the centre was cystic and contained fat, possibly, indicating origin from appendices epiploic<sup>3</sup>. In history, there is only one instance when a PBL was reported to found in hernia sac.<sup>5</sup>

In the literature, any PLB which is about 5 cm or more than that has shown a potential to become symptomatic<sup>9-13</sup>. Multiple PLB can form adhesion among themselves or with intrabdominal structures and can become symptomatic regardless of their size<sup>14</sup>. Most of the symptomatic patients had lower abdominal or urological symptoms. In a large proportion of patients, they were picked up as incidentalomas on routine imaging. Majority of the studies did not look at potential sources of free peritoneal bodies like ovary, uterus, colon, gallbladder and mesentery. Our study recommends looking for possible sources rather than relying on imaging and symptoms. Free peritoneal bodies causing symptoms like urinary retention and peritonitis<sup>8-11</sup> is a rare phenomenon but depending on the size and site, there are occurrences where benign looking free peritoneal bodies became symptomatic<sup>14</sup>.

There are no guidelines on how to deal with PLB in the literature. Based on literature review, we are putting forth a few recommendations for PLB. Every attempt should be made to retrieve them intra-operatively and should be sent for histopathology and relevant history should be mentioned in the requests. There are several other causes of PLBs, and surgeons and pathologists should not be tempted to declare every PLBs as infarcted appendices epiploic, unless there is relevant past medical history, positive evidence in terms of intra-abdominal findings and pathological findings. The literature review showed that every effort should be made to treat symptomatic PLBs while asymptomatic PLBs should be observed as studies have shown their potential to grow bigger in size. If these are found intra-operatively, a thorough intra-abdominal examination of potential sources of PLB should be done, as their origin can be as benign as fat to ovaries and ectopic pregnancy. If these are found as incidentalomas, a relevant history should be taken and examination should be performed to determine their source e.g. tuberculosis, fibroids, ovarian cysts, and stercoral perforation etc.

## CONCLUSIONS

Proper histopathology of PLB and examination of peritoneal structures intraoperatively to look for possible origin should be attempted at least. Every effort should be made to retrieve them if found intra-operatively and surgical exploration should be attempted only when they become symptomatic.

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