

# Benign Multicystic Peritoneal Mesothelioma: A Case Report

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**Abstract:** Benign multicystic peritoneal mesothelioma (BMPM) is a rare tumor originating from peritoneal mesothelial cells. Here, we present a case of an 18-year-old male with right lower abdominal pain. Physical examination revealed a palpable mass with unclear boundaries. Laboratory tests showed elevated levels of monocytes and high-sensitivity C-reactive protein. CT scan revealed a cystic mass in the ileocecal region with multiple septations. Laparoscopic surgery confirmed a cystic solid mass resembling beads on the colon's right side. Immunohistochemistry confirmed BMPM diagnosis. BMPM, especially in the ileocecal region, is uncommon and presents diagnostic challenges. Differential diagnosis includes lymphangioma, peritoneal metastasis, and malignant mesothelioma. CT findings, such as thin cyst walls and septations, aid in diagnosis. Recognition of BMPM's imaging features improves diagnostic accuracy. Surgical resection remains the primary treatment. This case underscores the importance of considering BMPM in young male patients with abdominal pain and emphasizes the value of imaging modalities in accurate diagnosis and management.

**Keywords:** Benign multicystic peritoneal mesothelioma (BMPM); Imaging; Diagnosis

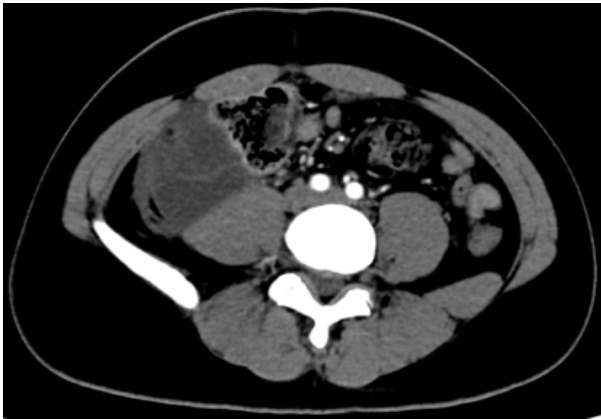
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## 1. Case study

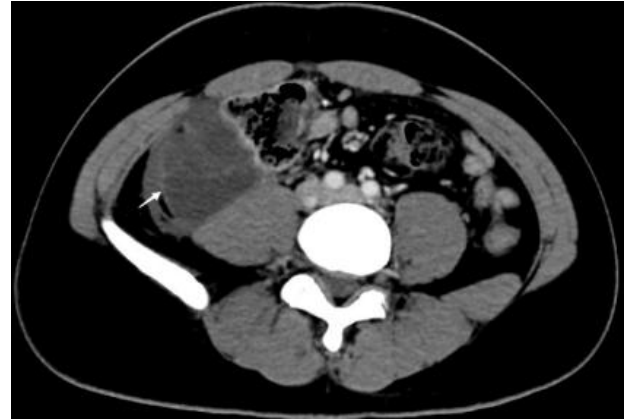
The patient, an 18-year-old male, experienced pain in the right lower abdomen for two days. Physical examination revealed a flat abdomen with a palpable tough mass on the right side, exhibiting unclear boundaries and average range of motion. There were no signs of tenderness, rebound tenderness, or muscle tension in the abdomen. The liver from the subcostal position was not palpable. Laboratory tests indicated a monocyte count of  $0.78 \times 10^9$  g/L, high-sensitivity C-reactive protein (hs-CRP) level of  $> 10.00$  mg/L (normal range: 0–3), cytokeratin level of 0.087 g/L (normal range: 0.2–0.43), and abnormal tumor detection measuring  $108.52 \mu\text{m}^2$  (in the range of 0–121). Colonoscopy revealed no abnormalities in any segment of the colon or rectum.

The computed tomography (CT) scan showed a cystic mass with a low-density shadow in the paracolic sulcus of the ileocecal region and a clear edge, measuring approximately  $7.4 \text{ cm} \times 6.4 \text{ cm} \times 13.3 \text{ cm}$  with multiple septations. Mild enhancement of the lesion edges and septations was observed on enhanced scans.

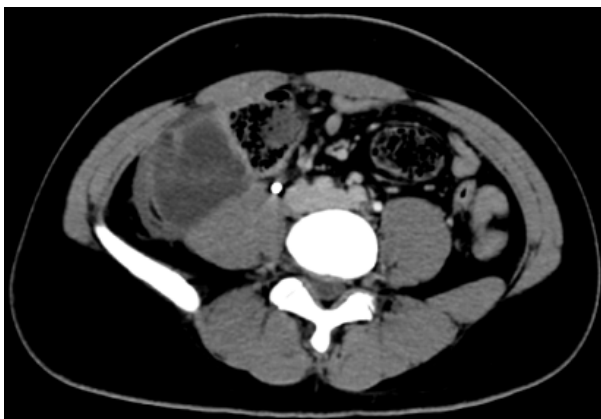
The arterial phase CT value was 25 HU, the venous phase CT value was 28 HU, and the delayed phase CT value was 32 HU (**Figures 1–3**). Additionally, arc-shaped, watery, low-density shadows were visible around the mass. Coronal reconstruction revealed a well-shaped appendix located below the mass with local peritoneal thickening (**Figure 4**).



**Figure 1.** The arterial phase of the enhanced scan shows a cystic mass in the ileocecal paracolic groove, approximately 7.4 cm × 6.4 cm × 13.3 cm in size, with enhancement visible at the edge and separation of the lesion, and a CT value of 25 HU



**Figure 2.** Venous phase of contrast-enhanced scan with a slightly enhanced septa (white arrow) and a CT value of 28 HU



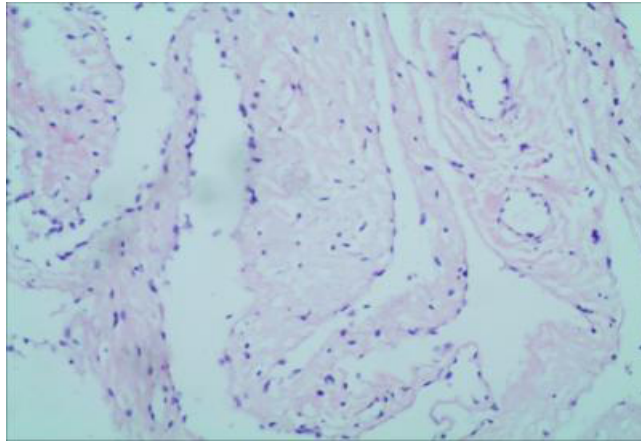
**Figure 3.** The delay period of the enhanced scan with a CT value of 32 HU



**Figure 4.** In the CT arterial phase coronal reconstruction image, the lesion edges and septa are enhanced (white arrow), and the right peritoneum is thickened

The diagnosis was a cystic mass occupying the paracolic groove in the ileocecal region with surrounding exudative changes. The patient underwent laparoscopic surgery under general anesthesia, involving laparoscopic abdominal mass resection and intestinal adhesion lysis. During the operation, a large cystic solid mass resembling a string of beads was observed on the right side of the colon. The cystic fluid had a jelly-like consistency and contained septa. The sizes of the tumors submitted for examination post-surgery were 10 cm × 10 cm × 4 cm and 7 cm × 2 cm × 1 cm, respectively. Immunohistochemistry results revealed CR (+), MC (+), CD34 (-), D2-40 (+), CD31 (vascular+), Desmin (partially +), Ki-67 (+ about 25%), EMA (-), P53 (-), Vimentin (+), S-100 (-), MOC31 (-), CK(pan) (+), WT 1 (+), and CK5/6 (+). The pathological diagnosis was benign

cystic peritoneal mesothelioma (BMPM; **Figure 5**).



**Figure 5.** Mass under electron microscope mainly composed of mesothelial cells and stroma (HE×100)

## 2. Discussion

BMPM is a rare tumor arising from peritoneal mesothelial cells, with the potential to develop in any peritoneal or subperitoneal area. The cyst wall typically consists of a proliferated fibrous stroma, lined with a single or double layer of flat or cuboidal mesothelial cells devoid of atypia. The fibrous stroma often contains edema, mucinous degeneration, and chronic inflammatory cell infiltration. BMPM predominantly affects women under 30 years old <sup>[1]</sup>, manifesting with symptoms like abdominal pain, distension, refractory ascites, and abdominal masses <sup>[2]</sup>. Reports of BMPM, particularly in the ileocecal region, are scarce.

In this case, CT findings revealed a cystic mass in the ileocecal paracolic groove with distinct boundaries, thin and uniform cyst walls, and multiple internal septations. The enhanced scan displayed mild enhancement along the lesion edges and septations, with internal cyst fluid demonstrating higher density than ordinary water CT values. The diagnostic challenge primarily revolved around accurate localization. Coronal CT reconstruction identified the appendix below the mass, excluding appendiceal origins. Furthermore, colonoscopy ruled out ascending colon involvement, pinpointing the origin to the peritoneum. Differential diagnosis involved distinguishing BMPM from lymphangioma, peritoneal metastasis, and malignant mesothelioma. Notably, lymphangiomas typically located in the retroperitoneum, have irregular shapes, multiple septations, and lack a clear relationship with the peritoneum. Peritoneal metastases present with primary lesions and omental cake signs from thickening of the peritoneum and massive ascites <sup>[3]</sup>, while malignant mesothelioma displays atypical mesothelial cell growth <sup>[2,4]</sup>.

Paracolic BMPM poses diagnostic hurdles, requiring meticulous exclusion of adjacent structures such as the appendix and ascending colon. Recognition of characteristic imaging features, such as thin and uniform cyst wall, multiple septations that are mildly enhanced, and no obvious mural nodules on enhanced scanning, facilitates accurate preoperative diagnosis, with surgical resection serving as the mainstay treatment <sup>[5]</sup>.

## Disclosure statement

The authors declare no conflict of interest.

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