

Spilled stones following pyelolithotomy: an unusual mimic of peritoneal carcinomatosis

Barakat Ogunde, MD, Kaitlin M. Zaki-Metias, MD, Mehrvaan Kaur, MD, Rafat Dallo, MS-IV, Mohammed Al-Hameed, MD, Zeeshaan S. Bhatti, MD

St. Joseph Mercy Oakland Hospital, Pontiac, MI

Purpose:

While spillage of intraperitoneal gallstones has been reported frequently in the literature, spilled renal stones after urologic intervention is rare. The dropped renal stones may mimic peritoneal carcinomatosis (PC) on imaging, causing concern and potentially leading to unnecessary diagnostic workup. Additionally, these dropped stones may cause surrounding inflammation, potentially leading to the formation of adhesions or an intra-abdominal abscess. Calcifications along the peritoneal lining are generally interpreted as peritoneal carcinomatosis until proven otherwise. However, this case highlights the importance of a detailed, adequate history. We describe a case of intraperitoneal spilled renal stones after pyelolithotomy resulting in small bowel obstruction, in addition to a review of diagnostic pitfalls and radiologic mimics of PC.

Case Description:

A 33-year-old female with a history of nephrolithiasis status-post pyelolithotomy at an outside institution two weeks prior presented to the emergency department with diffuse abdominal pain and low-grade fever. At this time, records from her prior hospitalization and procedure were not available. A contrast-enhanced CT of the abdomen and pelvis showed interval removal of the renal stones with placement of bilateral ureteral stents. There were unexpected findings of moderate volume ascites with peritoneal enhancement, and scattered

nodules and calcifications throughout the peritoneum. The appendix was dilated and fluid-filled. The differential included peritoneal carcinomatosis possibly related to a ruptured appendiceal mucinous adenocarcinoma versus a primary ovarian malignancy. She subsequently underwent a diagnostic paracentesis, which revealed no evidence of malignancy or urine leak.

The patient presented again, now one month after the initial procedure, with worsening left-sided abdominal and pelvic pain, subjective fever, emesis, and obstipation. Physical examination revealed tenderness to palpation of the left hemiabdomen and pelvis with hypoactive bowel sounds. CT of the abdomen and pelvis with intravenous contrast was obtained, and again demonstrated numerous calcifications, now identified as scattered spilled stone fragments, throughout the peritoneal cavity secondary to prior urologic procedure and associated with peritonitis and inflammation. A conglomerate of inflamed spilled stones in the left upper quadrant was associated with inflammatory tethering of the proximal left ureter and a few small bowel loops, resulting in stricturing of the proximal left ureter with severe left hydronephrosis and partial low-grade obstruction of few proximal small bowel loops.

The patient was admitted for management of the left ureteral stricture, for which a nephrostomy tube placed. Her small bowel obstruction was managed conservatively. Her condition stabilized, and she was subsequently discharged home.

Discussion:

Tumors originating from the abdomen and pelvis often metastasize to the peritoneum, implicating a poor prognosis for patients. Peritoneal metastasis most commonly occurs as a result of ovarian or gastric malignancies. The term peritoneal carcinomatosis (PC) is reserved for extensive peritoneal metastases of epithelial origin. Evaluation of PC and its complications are

best and most frequently assessed with computed tomography (CT), with varying appearances including nodular enhancement of the thickened peritoneum, soft tissue nodules, ascites, omental caking, and nodular calcifications, such as in the case of cystadenocarcinoma of the ovary. Pitfalls in diagnosis include common mimics such as pseudomyxoma peritonei and non-epithelial tissue origin malignancies, such as primary peritoneal mesothelioma and peritoneal sarcomatosis.

An extremely uncommon differential diagnosis for nodular peritoneal calcifications that radiologists should be aware of is spilled intraperitoneal stones. Spilled intraperitoneal stones mimicking PC is not itself a novel consideration, with numerous reports of spilled gallstones occurring during cholecystectomy and an estimated incidence ranging from 6% to 40% of all laparoscopic cholecystectomies. Approximately 8.5% of these retained gallstones have led to further complications, including the formation of abscesses, intra-abdominal adhesions, and implants or granulomas, which may radiologically mimic PC on CT imaging.

Calcified soft tissue nodules along the peritoneal lining are generally interpreted as peritoneal carcinomatosis on CT imaging until proven otherwise. However, this case highlights the importance of a detailed history, including a history of malignancy and recent infection or surgical intervention.

Author Photos:



Barakat Ogunde, MD



Kaitlin Zaki-Metias, MD



Mehrvaan Kaur, MD

References

1. Vicens RA, Patnana M, Le O, Bhosale PR, Sagebiel TL, Menias CO, Balachandran A. Multimodality imaging of common and uncommon peritoneal disease: a review for radiologists. *Abdom Imaging*, 2015;40(2): 436-456.
2. Karabulut N, Tavasli B, Kiroğlu Y. Intra-abdominal spilled gallstones simulating peritoneal metastasis: CT and MR imaging features. *Eur Radiol*, 2008; 18: 851-854.
3. Nayak L, Menias CO, Gayer G. Dropped gallstones: spectrum of imaging findings, complications and diagnostic pitfalls. *Br J Radiol*, 2013; 86(1028): 20120588.
4. Lee JW, Cho SY, Yean J, Jeong MY, Son H, Jeong H, Kim HH, Lee SB. Laparoscopic Pyelolithotomy: Comparison of Surgical Outcomes in Relation to Stone Distribution Within the Kidney. *J Endourol*, 2013; 27(5): 592-597.