

## A Man with Shortness of Breath and Bloating

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The patient is a 61-year-old male with a past medical history of hypertension and insulin-dependent diabetes mellitus presented to the ED with new onset shortness of breath. He reported a three week progression of dyspnea after one flight of stairs, from a normal baseline. The patient also noticed 2 pillow orthopnea and increased urinary frequency and urgency. He denied fevers, chills, chest pain, palpitations or productive cough. Symptoms began when he ran out of his oral medications three weeks prior to admission (furosemide, enalapril, digoxin, metoprolol, spironolactone, aspirin). Family history was positive for alcoholic cirrhosis. Social history was positive for occasional tobacco and alcohol usage. Review of systems was also significant for a 2 to 3 month history of abdominal fullness and q3 day bowel movements. Upon further review, the patient stated he had a distended abdomen earlier, as an adult, that had somewhat disappeared until recently. He denied decreased oral intake, nausea, emesis, reflux, abdominal pain, diarrhea, melena or hematochezia.

Physical exam revealed an obese African-American male in no distress. Vital signs were pertinent for a resting tachycardia at 128 beats per minute and a blood pressure of 149/93. He had mild jugular venous distension and tachycardia with frequent ectopic heart sounds. Lung exam showed bibasilar crackles higher in the left lung field. His abdomen was massively distended with a rounded appearance, and dull to percussion throughout. Bowel sounds were loudest in the right flank area. There was no pain on palpation, rebound or guarding, and shifting dullness or a fluid wave could not be elicited. His extremities had 1+ pitting edema bilaterally to the knees. Labs including serum chemistry, blood count, liver function panel, PT and PTT, and cardiac enzymes were all within normal ranges. ECG revealed sinus tachycardia with multiple premature ventricular conduction and a left bundle branch block, while chest x-ray was notable for cardiomegaly and bilateral pulmonary vascular congestion, consistent with heart failure.

The patient was admitted with a diagnosis of heart failure, exacerbated by medication non-compliance. He was restarted on his medications and ruled out for



Figure 1.

myocardial infarction. An echocardiogram showed global hypo- to akinesis with an ejection fraction of approximately 15%. His symptoms improved with diuresis and he was asymptomatic by the end of his hospital admission. However, the size of his abdomen did not decrease, despite a negative fluid balance. An ultrasound of his abdomen was performed to evaluate for possible ascites secondary to heart failure. No ascites was seen. Instead, a large cystic space-occupying lesion was appreciated, involving most of the pelvis and abdomen, with mass effect on the left kidney causing moderate to severe left hydronephrosis (Fig 1). Computer tomography confirmed the cystic mass that measured 32 x 25 x 30 centimeters. (Figs 2-3). The massive size of the lesion prevented identification of an exact origin. Surgery was consulted for resection and tissue diagnosis. An uncomplicated open laparotomy was performed, which located the mass beneath the mesentery of the colon with the left ureter draped over it. There was no obvious connection to any of the surrounding organs. Due to the size of the mass, it could not be entirely excised, so it was first aspirated, with the removal of 12,000 ccs of serous fluid, and then resected. Pathology was consistent with benign mesothelial cyst. No further workup was required and the patient was discharged home in stable condition.

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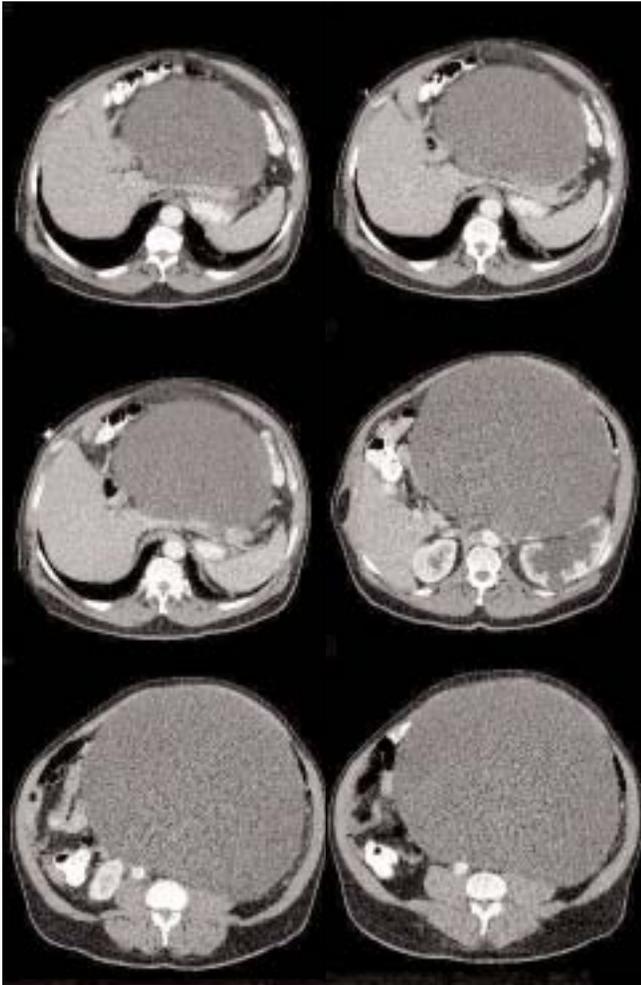


Figure 2.

### Discussion

Mesenteric cysts are very rare benign fluid-filled tumors. They account for only 1 in 100,000 acute adult hospital admissions.<sup>1</sup> They're more commonly found in the pediatric population (1 in 20,000 pediatric admissions).<sup>2</sup> This is probably due to the more rapid progression of symptoms in children, with a greater ratio of cystic volume to intraabdominal volume). The Italian anatomist Benineni reported the first mesenteric cyst in 1507 from an autopsy of an 8-year-old boy.<sup>3</sup> P.J. Tallaux performed the first successful resection of a mesenteric cyst in 1850.<sup>4</sup> Since then 750 to 1000 cases have been reported in the literature.<sup>5-6</sup>



Figure 3.

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Most mesenteric cysts in adults are asymptomatic. Over 40% are diagnosed incidentally during unrelated surgeries.<sup>5</sup> Others are found during routine physical or radiological examinations. Physical examination may show a distended abdomen mobile in the transverse plane only, as opposed to mobile in all directions with omental cysts.<sup>6</sup> The most common symptoms are abdominal pain with distension, anorexia, nausea, vomiting, and malaise. Pain can be caused by infection or torsion of the cyst, hemorrhage into the cyst, mesenteric stretching from the cyst, or compression of surrounding structures causing obstructions.<sup>7</sup> Occasionally cysts will cause mesenteric volvulus or herniations.<sup>5-6</sup>

Classification of mesenteric cysts used to be variable and inconsistently applied, lacking pathologic correlation. In 1986, Ros et al collected 41 cases of mesenteric and omental cysts and retrospectively classified them using histology and imaging criteria. Five types of mesenteric cysts were identified. These include lymphangiomas (endothelial lining), enteric duplication cysts (enteric and double-muscle lining), enteric cysts (enteric mucosa only), mesothelial cysts, and non-pancreatic pseudocysts that have a fibrous wall but no lining.<sup>8</sup> Other non-mesenteric cysts include cystic mesotheliomas, cystic spindle cell tumors, cystic teratomas, and cysts originating from abdominal or retroperitoneal organs.<sup>9</sup>

Lymphangiomas are usually large, thin-walled, multi-loculated cystic masses, formed from small bowel lymphatic tissue that congenitally does not communicate with lymphatic vessels. They are almost always seen in childhood or adolescents.<sup>12</sup> Lymphangiomas are often attached to bowel wall and are more likely to cause partial bowel obstructions.<sup>18</sup> Ultrasound shows lymphangiomas as multi-septated cysts that can be anechoic or contain fluid-filled levels caused by debris.<sup>8,10</sup> CT scans show a cystic mass with attenuation (Hounsfield units) ranging from water (serous contents) to fat (chylous contents).<sup>11</sup>

Enteric duplication cysts are thick-walled, unilocular cysts with predominantly serous contents. These cysts probably were once attached to normal bowel, but separated and migrated into the mesentery. Their composition “duplicates” that of the normal enteric wall. On histologic examination, all layers of bowel are seen, including

mucosa, circular and longitudinal muscle layers, and mesenteric plexus. Ultrasound shows a thick-walled, anechoic cyst that internally resembles small bowel. CT scan reveals the thick wall with serous fluid attenuation.<sup>8-9</sup>

Enteric cysts are thin-walled, unilocular cysts lined with gastric mucosa only, lacking the muscle layers of an enteric duplication cyst. They are formed from small bowel or colonic diverticuli that migrate into the mesentery. Ultrasound shows a hypoechoic mass with occasional septations. CT scan shows a fluid-filled mass without an identifiable wall and attenuation consistent with serous contents.<sup>8-9</sup>

Mesothelial cysts are thin-walled, unilocular cysts lined with mesothelial cells. They are thought to arise from incomplete fusion of mesothelial layers during development, and are found in mediastinum (pericardial, pleural), omentum, and retroperitoneal areas (splenic). Ultrasound shows an anechoic mass with acoustic enhancement. They appear similar to enteric cysts on CT scan.<sup>8-9</sup>

Non-pancreatic pseudocysts, like their pancreatic namesakes, arise from local trauma or inflammation. They are thought to be the results of a hematoma or abscess that did not resorb. Pathologically they are thick-walled and septated, with hemorrhagic or purulent contents. Ultrasound shows a thick-walled mass with echogenic debris. CT scan shows a mass that may have a fluid-fluid level differentiating blood from pus.<sup>8-9</sup>

Other masses in the abdominal cavity can mimic mesenteric cysts. Cystic mesotheliomas are an intermediate formation, between an adenomatoid tumor and a malignant peritoneal mesothelioma. These benign tumors are usually found in middle-aged women. They are usually large and multicystic, and tend to reoccur locally after resection.<sup>13</sup> Spindle cell tumors, otherwise known as gastrointestinal leiomyomas or leiomyosarcomas, can occasionally undergo necrosis. This causes liquification and hemorrhage into the center of the neoplasm, creating an appearance similar to mesenteric cysts on imaging. Ultrasound and CT scan will show a complex cystic mass with a lot of internal debris.<sup>14</sup> Mesenteric teratomas, usually seen in children,

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have cystic components and resemble mesenteric cysts on physical exam. However, imaging studies will pick up calcifications and accumulations of fat, that do not appear in mesenteric cysts.<sup>15</sup>

### Treatment

Mesenteric cysts very rarely resolve spontaneously and surgical resection is most often required. Drainage of cysts are not recommended, because they tend to reaccumulate quickly. Marsupialisation of cysts are also not performed, since they increase infection risk from a persistently draining sinus. Complete resection of the cyst usually prevents recurrence. This may require the removal of a bowel segment, if the cyst cannot be separated cleanly, as is the case with lymphangiomas.<sup>7</sup> Recently, laparoscopy has been used for identification and removal of mesenteric cysts. Like other minimally invasive surgeries, laparoscopic excision of mesenteric cysts significantly reduces hospital duration and complication rates. Mesothelial cysts are usually easier to remove, due to their loose attachments to surrounding tissues.<sup>16</sup> However, our patient's cyst was too large and too close to other vital structures to be safely removed by laparoscopy.

### Conclusion

Because of their relative rarity, mesenteric cysts are not commonly considered by most primary care physicians evaluating patients with abdominal complaints. Certainly in cases of appreciable abdominal distention, when physical examination is not consistent with ascites, a work-up to rule out mesenteric cyst pathology could be warranted. Ultrasound should be the first imaging performed because of its ease of use and identification of internal components of the cyst. CT scan and MRI can delineate physical nature and relationship to adjacent structures and should be performed prior to surgery. . New approaches such as laparoscopic removal make mesenteric cysts easy to cure. A definitive diagnosis can only be made after surgical resection and histologic examination.

### References

1. Takiff, H., Calabria, R., Yin, L., Stabile, B.E. Mesenteric cysts and intra-abdominal cystic lymphangiomas. *Arch. Surg.* 1985; 120: 1266-1269.
2. Kurtz, R.J., Heiman, T.M., Beck, A.R., Holt, J. Mesenteric and retroperitoneal cysts. *Arch. Surg.* 1986; 203: 109-112.
3. Bearhs, O.M., Judd, E.S., Docherty, M.G. Chylous cysts of the abdomen. *Surg. Clin. North Am.* 1950; 302: 1081-1096.
4. Tallaux, P.J. Cyste du mesentere un homme: ablation par la gastromie: quersion. *Rev. Ther. Med. Chir. Paris.* 1880; 47: 479.
5. Mohanty, S.K., Bal, R.K., Maudar, K.K. Mesenteric cyst - an unusual presentation. *J Pediatr Surg* 1998; 33: 792-793.
6. O'Brien, M.F., Winter, D.C., Lee, G., Fitzgerald, E.J., O'Sullivan, G.C.. Mesenteric cysts - a series of six cases with a review of literature. *Ir. J. Med. Sc.* 1999; 168: 233-236.
7. Mollitt, D.R., Ballantine, T.V.N., Grosfield, J.L. Mesenteric cysts in infancy and childhood. *Surg. Gynaecol. Obstet.* 1978; 147: 182-184.
8. Ros, P.R., Olmsted, W.W., Moser, R.P Jr., Dachman, A.H., Hjermsstad, B.H., Sobin, S.H. Mesenteric and omental cysts: histologic classification with imaging correlation. *Radiology* 1987; 164: 327-332.
9. Stoupis, S., Ros, P.R., Abbitt, P.L., Burton, S.S., Gauger, J. Bubbles in the belly: imaging of cystic mesenteric or omental masses. *Radiographics* 1994; 14: 729-737.
10. Wicks, J.D., Silver, T.M., Bree R.L. Giant cystic abdominal masses in children and adolescents: ultrasonic differential diagnosis. *Am J Radiology* 1978; 130: 853-857.
11. Davidson, A.J., Hartman, D.S. Lymphangioma of the retroperitoneum: CT and sonographic characteristics. *Radiology* 1990; 175: 507-510.
12. Sun, C.C.J., Tank, C.K., Hill, J.L. Mesenteric lymphangioma. *Arch Pathol Lab Med* 1980; 104: 316-318.
13. Katsube, Y., Mukai, K., Silverberg, S.G. Cystic mesothelioma of the peritoneum: a report of five cases and review of the literature. *Cancer* 1982; 50: 1615-1622.
14. Volk, B.A., Scholmerich, J., Farthmann E., Gerok W., Wenz, W. Leiomyoblastoma of the stomach - a case report on ultrasonographic differential diagnosis of cystic lesions in the abdomen. *Hepatogastroenterology* 1983; 30: 33-35.
15. Bowen, B., Ros, P.R., McCarthy, M.J., Olmsted, W.W., Hjermsstad, B.M. Gastrointestinal teratomas: CT and US appearance with pathologic correlation. *Radiology* 1987; 162: 431-433.
16. MacKenzie, D.J., Shapiro, S.J., Gordon, L.A., et al. Laparoscopic excision of a mesenteric cyst. *J. Laparoendosc. Surg.* 1993; 3: 295-296.