

Multiloculated cystic mesothelioma depicted on non-contrast MRI in a patient with impaired renal function

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Abstract

Multicystic peritoneal mesothelioma is a rare cystic neoplasm of the peritoneal cavity. It is a primary tumor of the peritoneum that arises from peritoneal mesothelium. The lesion may be macro or microcystic, and can involve several sites of the peritoneal surface including alimentary tract serosal surfaces. Its imaging diagnosis can be challenging, especially when it is microcystic in morphology and the cross-sectional imaging is without intravenous contrast. A histopathologic review is required to differentially diagnose this case in light of other benign or malignant neoplasms. We present a case of multicystic peritoneal mesothelioma, in a 64-year-old woman with renal insufficiency and a history of abdominal surgery. The non-contrast MRI findings helped in the differential diagnosis which was confirmed by the further evaluation of histopathology.

Keywords

multicystic peritoneal mesothelioma; non-contrast MRI; impaired renal function.

Introduction

Multicystic peritoneal mesothelioma is characterized by having numerous fluid-filled cysts of mesothelial origin, scattered along the abdomen [1]. More than 200 cases have been reported since 2017 [2]. The mean age at diagnosis is 37 years old [3], impacting mainly young-middle-aged females [4]. The primary tumor is capable of involving various peritoneal surfaces. It is often difficult to differentially diagnose due to limitations associated with the common imaging techniques. Knowing the risk contrast agent has on the patient's kidney function, non-contrast CT and MRI had to be employed [5]. MRI with single shot fast spin echo T2 waited images and immunohistochemical staining were key to identifying the multicystic peritoneal mesothelioma in this case.

Case Presentation

A 64-year-old female patient presented with colicky abdominal pain in the left flank following blunt trauma towards her knee and right flank, after falling in the bathroom 3 weeks ago. Physical examination of the abdomen was soft, with no exhibition of distention, fluid wave, or mass. No rigidity or guarding was noted. An uncomplicated umbilical hernia was present. A right pararectal incision was present following a post-sleeve gastrectomy in 2016. The patient was morbidly obese, with a BMI of 46.48 kg/m². The patient has a history of liver and kidney transplant in 2010, hepatitis C infection in 2016, bilateral knee replacement in February 2021, herpes zoster, and occasional infections due to consumption of high-risk medication and immunosuppressives. Lab results were impartial to indicate any ongoing infection, with inflammatory markers within the normal range. No leukocytosis was detected. From the preliminary observation, a hematoma was suspected. Abdominal ultrasonography was done, revealing a solid multi-cystic mass in the right abdomen measuring 11.6 X 6.4 X 3.0 cm. An abdominal NCCT (Non-contrast computerized tomography) revealed; a unilocular cystic mass measuring 8.3 X 5.2 X 11.6 cm, present at the right paracolic gutter extending to the right side of the omentum and lower subhepatic space (Figure 1). After the NCCT, hematoma was ruled out and a cystic lymphangioma was suspected. The patient underwent an additional Non-contrast MRI (Magnetic Resonance Imaging) to further characterize the internal content of the cyst. The MRI revealed right omental multiloculated cystic mass adjacent to the ascending colon serosa and abutting inferior liver capsule. The internal multiloculated content of the cystic lesion was better demonstrated on T2 weighted single shot fast spin echo images (HASTE). The multiloculated cystic lesion was measuring 9.6 X 5.4 X 11.1 cm. Smaller-sized cysts were also noted with the same imaging features at the serosal surfaces of the small bowel loops measuring 1.2 cm (Figure 2). Multiple other cystic lesions were present at the peritoneal layers at the porta hepatis, serosal surfaces of the small bowel and colon as well as on the middle omental surfaces (Figure 3). A differential diagnosis of multicystic mesothelioma was closer based on MRI findings. The patient was referred to pathology for a CT-guided biopsy of the cyst: core biopsy revealed microscopic cysts separated by thin fibrous tissue (Figure 4a). The cysts were layered by a single layer of epithelial cells that expressed CK5 and CK6, calretinin (Figure 4b) and D2-40 and was found to be negative for beta-catenin and CD31. Those findings were consistent with multicystic benign mesothelioma. Due to the resolution of the abdominal pain during the next follow-up, and the patient's refusal to undergo surgery they were not surgically removed. The patient has been having regular follow-ups for other underlying conditions. However, no longer suffered abdominal pain.

Discussion

Multicystic peritoneal mesothelioma originates from mesothelial cells and is multicystic as well as multi-septated in morphology. The cystic mass is adherent to the peritoneal wall. They are also viewed as multiloculated peritoneal inclusion cysts. Multicystic peritoneal mesothelioma is a benign mesothelial cystic neoplasm, which does not have malignant potential or transformation, however, may recur after surgical removal [2,7,8].

The imaging diagnosis of multicystic peritoneal mesothelioma can be challenging as there are no specific imaging features reported [9]. In our case the findings mimicked an omental mass on non-contrast CT, since the morphologic findings were inconclusive for the type of the cystic lesion. This happened

because of the multiple small sized cysts with internal connecting septae were not demonstrated on non-contrast CT scan. However, MRI with single shot fast spin echo T2 weighted images was able to demonstrate the fine morphology of the multiple small cysts and helped the differential diagnosis. T2 weighted single shot fast spin echo (HASTE) is the most sensitive imaging technique for the evaluation of cystic lesions in the abdomen, since it is not susceptible to breathing artifacts and has good resolution [9]. The common radiological differential diagnosis for multicystic peritoneal mesothelioma is abdominal lymphangiomas which also present as multiloculated cystic masses. Lymphangiomas, however, primarily occur in the paediatric population and do not have a gender predilection. The lesions are usually in the abdomen with presentation reported in the mesenteric, retroperitoneal and omental locations. Lymphangiomas may also demonstrate a characteristic elongated shape and may cross from one retroperitoneal compartment to another. The list of other differential diagnosis for intraabdominal cystic neoplasms is extensive and includes endometriosis, pseudomyxoma peritonei, mucinous cystadenoma, cystic teratoma, cystic mesothelioma, Mullerian cyst, epidermoid cysts, tailgut cyst, bronchogenic cyst, cystic changes in solid neoplasms, and perianal mucinous carcinoma [8-10]. There is significant overlap between the imaging features of these lesions; however, the clear serous content of the cysts on single shot fast spin echo T2 weighted images and thin septations helped to suggest the benignity of this lesion.

Complete removal of the cystic lesion, if possible, is the best treatment, however, local recurrence may occur [7]. In our case, the patient refused the surgical treatment.



Figure 1a: Non-contrast CT of the Abdomen in axial plane. A unilocular cystic lesion is present at the left lower omentum abutting the ascending colon serosa (arrow).



Figure 1b: Non-contrast CT of the Abdomen in coronal plane. The cystic lesion in the left lower quadrant is again noted which abuts both the ascending colon and the tip of the liver.

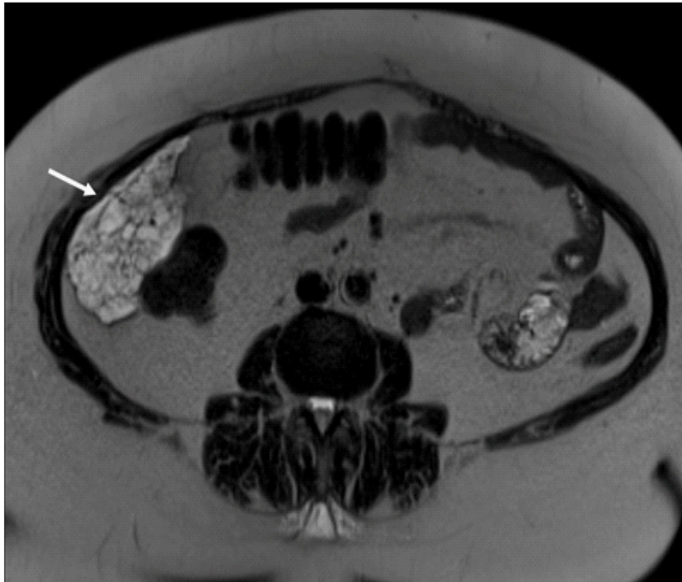


Figure 2a: T2 weighted HASTE image in axial plane reveals the same cystic mass with multiloculated internal content (arrow).

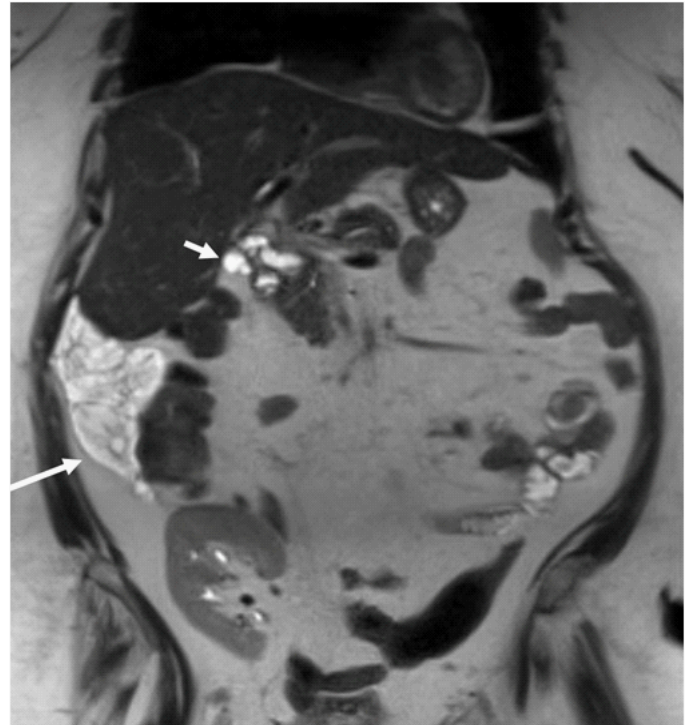


Figure 2b: T2 weighted HASTE image in coronal plane reveals the cystic mass with multiloculated internal content abutting the ascending colon and the tip of the liver (long arrow), also a sub-centimeter satellite cyst at the peritoneal surface along the porta hepatis (short arrow).



Figure 3: Separate cysts at the mid omentum (black arrow) and at the porta hepatis (white arrow).

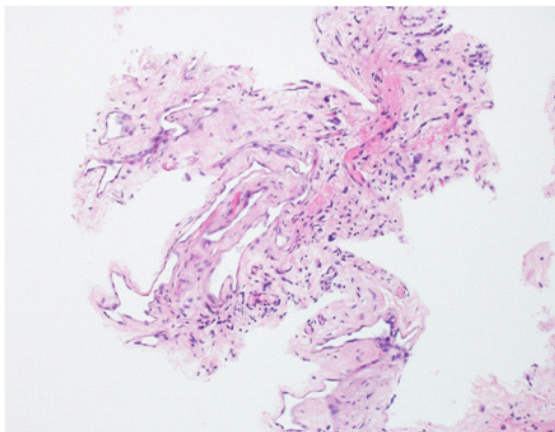


Figure 4a: (100X magnification: Hematoxylin & Eosin): Thin walled fibrous tissue forming microcysts, lined by flat to cuboidal benign epithelial cells, suggestive of benign mesothelial cyst.

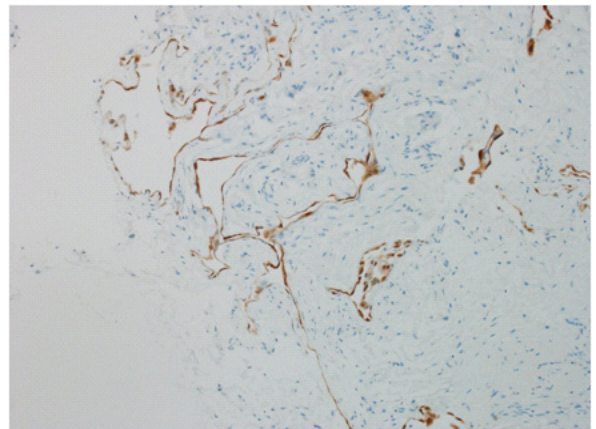


Figure 4b: (200X magnification: Calretinin immunostain): Nuclear and cytoplasmic expression, strong, to the lining epithelium, confirming the mesothelial origin of the cyst.

Conclusion

In conclusion, we described a case of an uncommon cystic mass in the abdomen with multiple satellite cystic lesions along the peritoneal surfaces and serosal surfaces of the alimentary tract. Although other imaging methods were able to detect the presence of a cystic mass, they were inferior in their depiction of its details. The MRI images with T2 weighted images helped to suggest the benignity of the lesion, whilst the biopsy confirmed the diagnosis of multicystic peritoneal mesothelioma.

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