CASE REPORT

A case of a giant mucocoele of the appendiceal stump presented with a palpable mass in the right thigh: pre-operative diagnosis based on characteristic multidetector CT findings

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ABSTRACT. The pre-operative diagnosis of a mucocoele of the appendiceal stump (MAS) may be difficult owing to rarity and non-specific clinical presentation. However, a pre-operative diagnosis of a MAS is important to prevent widespread dissemination by inadvertent spillage of mucous contents. We describe a case of a MAS presenting with a palpable mass in the right thigh in which a pre-operative diagnosis was made by characteristic multidetector CT (MDCT) findings.

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A mucocoele of the appendiceal stump (MAS) is a rare entity. Because of rarity and the non-specific nature of the disease, pre-operative diagnosis of a MAS may be difficult [1–3]. However, manipulation of a MAS during surgery or an ultrasound-guided biopsy before surgery may result in rupture or spillage of the mucous content into the peritoneal space, leading to formation of a pseudomyxoma peritonei [4]. Therefore, a pre-operative diagnosis of a MAS is important to avoid the risk of such a complication. Although there are only a few case reports describing a MAS in the English literature [1, 2], these reports did not provide characteristic CT findings of a MAS. In particular, no reports have demonstrated the extension of a MAS into the right thigh along the right femoral canal. We present a case of a MAS presenting with a palpable mass in the right thigh in which a pre-operative diagnosis of a MAS was made using characteristic multidetector CT (MDCT) findings.

Case report

A 78-year-old man presented with a palpable mass in the right upper thigh and swelling of the right lower extremity for 2 months. The patient had a history of an appendectomy that was performed 40 years ago. A physical examination demonstrated the presence of a palpable mass (8 × 10 cm) in the right upper thigh. Diffuse right lower extremity oedema was also noted, suggestive of deep vein thrombosis. There was no tenderness or rebound tenderness on palpation of the mass. There was no abnormality on laboratory findings.

Doppler ultrasonography was performed to determine the presence or absence of deep vein thrombosis. A well-defined lobulated mass (10 × 30 cm) with heterogeneous internal echo texture was noted in the right lower quadrant (Figure 1a). The mass extended into the right upper thigh. On the basis of the sonographic findings, it was uncertain whether the mass was cystic or solid. Thrombus was noted in the right common, superficial and deep femoral veins (Figure 1b). Abdominopelvic CT (Lightspeed 16; GE Healthcare, Milwaukee, WI) was performed for further evaluation of the mass. An elongated tortuous cystic mass with a thin enhancing wall and focal calcification was noted in the extraperitoneal space of the right lower quadrant on contrast enhanced CT images (Figure 2a,b). The distal portion of the mass had extended into the right thigh along the right femoral canal. A focal round indentation caused by the mass was identified at the medial aspect of the caecum on coronal multiplanar reformatted (MPR) images (Figure 2b). The presence of this feature in the absence of broad contact between the rest of the mass and the caecum indicated that the origin of the mass was the medial portion of the caecum (*i.e.* the expected location of the appendix). Furthermore, luminal continuity was demonstrated within the tortuous mass on consecutive CT images (Figure 2c). Extrinsic compression of the right external iliac vein by the mass resulted in deep vein thrombosis in the right common, superficial and deep femoral veins. There was no intraperitoneal mass or fluid collection. The combination of these MDCT findings led to the highly specific diagnosis of a MAS extending into the right thigh. Two separate incisions were made in the right lower abdomen and right upper thigh to facilitate dissection and removal of the mass. Owing to adhesion between the mass and surrounding tissue at the level of the right femoral canal, *en bloc*

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resection of the entire mass was impossible. The caecum, terminal ileum and a portion of the mass above the right femoral canal were removed simultaneously and an ileocolostomy was performed. However, a portion of the mass below the right femoral canal was removed separately. The pathological diagnosis was a mucinous cystadenoma. There was no evidence of recurrence 3 years after surgery.

Discussion

An appendiceal mucocoele is defined as appendiceal dilatation caused by accumulation of mucus in the lumen [5]. Four histological subtypes can cause an appendiceal mucocoele: a retention cyst, mucosal hyperplasia, mucinous cystadenoma and mucinous cystadenocarcinoma. Although pre-treatment diagnosis of a MAS is difficult owing to its non-specific clinical presentation, its pre-operative diagnosis is important to prevent widespread dissemination by inadvertent spillage of mucinous contents. A previous case report stated that pre-operative diagnosis of a MAS was possible based on the imaging features [1]. However, the sole imaging feature of the MAS described in this report was a cystic mass located adjacent to the caecum. This imaging feature may have been a non-specific finding that required a differential diagnosis, such as a mesenteric cyst, duplication cyst, urachal cyst, lymphangioma, abscess or haematoma [6–9].

Owing to the remarkable advance of MDCT technology, fine details of small structures can be recognised. Coronal and sagittal MPR images without any loss of image quality compared with transaxial source images can be obtained. This three-dimensional technique has markedly enhanced understanding of lesions with a complex anatomy. Characteristic MDCT findings of a

MAS were demonstrated on coronal MPR images in the present case. A focal round indentation by the mass was identified at the medial aspect of the caecum on a coronal MPR image. This finding was unaccompanied by broad contact between the rest of the mass and the caecum, indicating that the mass originated from the medial portion of the caecum (*i.e.* the expected location of the appendix). Furthermore, luminal continuity was demonstrated within the tortuous mass on consecutive CT images. The combination of these CT findings provided strong evidence of the presence of a MAS in a patient with a history of an appendectomy, obviating the need for another differential diagnosis. Calcification on the wall of a cystic mass is a known CT finding of an appendiceal mucocoele [10, 11].

Although there has been a case report of appendiceal mucocoele presented with a right inguinal hernia caused by a pseudomyxoma peritonei [12], the extension of a MAS into the right lower extremity along the right femoral canal has not been reported in the English literature. This peculiar phenomenon may originate from rupture of previous appendicitis into the retroperitoneum (*i.e.* the extension of a MAS into the extraperitoneal space through the peritoneal defect) [13]. The pre-operative diagnosis of the MAS was made in the present case, but *en bloc* resection of the MAS was impossible owing to adhesion between the mass and the surrounding tissue at the right femoral canal. The extension of a MAS into the right thigh suggests that *en bloc* removal of the mass may be difficult.

In conclusion, the pre-treatment diagnosis of a MAS is important to prevent widespread dissemination by inadvertent spillage of mucinous contents. Its pre-operative diagnosis may be possible by identification of a focal indentation of the caecum caused by an elongated cystic mass in the right lower quadrant and luminal

(a)

(b)

Figure 1. (a) A well-defined lobulated mass with heterogeneous internal echo texture (arrows) is noted in the right lower quadrant on a transverse sonographic image. (b) The mass (white arrowheads) shows extension into the right inguinal area along the right common femoral artery (white arrows) and vein (black arrowheads) on a transverse colour Doppler image. A thrombus in the right common femoral vein (black arrowheads) is also demonstrated.

(a)

(b)

(c)

Figure 2 (a) A cystic mass (M) with incomplete septations is noted between the right psoas muscle (P) and external iliac vessels (arrowhead) on an axial contrast-enhanced CT image at the level of the pelvis. (b) A small, round indentation (black arrows) caused by the mass (M) is identified at the medial aspect of the caecum (black arrowheads) on a coronal multiplanar reformatted (MPR) image. The mass shows extension into the right thigh (white arrows). Note the thin enhancing wall with a focal calcification (white arrowhead) on the mass. (c) Luminal continuity (arrows) is noted within the tortuous mass on a coronal MPR image obtained 1 cm posterior to (b).

continuity within the tortuous mass on contrast enhanced MDCT images in patients with a history of an appendectomy.

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