CASE REPORT

CT characteristics of a uterus-like mass in the sigmoid mesocolon

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ABSTRACT. A uterus-like mass is a rare, benign extra-uterine tumour composed of smooth muscle and endometrium. The majority of uterus-like masses occur in the ovary. Rarely, uterus-like masses occur in the broad ligament, small bowel, small bowel mesentery or uterine cervix. Here, we report a case of a uterus-like mass in the sigmoid mesocolon. A well-defined, markedly enhanced soft-tissue mass with central cystic change and haemorrhage was observed on CT. The current report describes the CT characteristics of this sigmoid mesocolon uterus-like mass together with the differential diagnoses.

Received 18 September 2009

Accepted 10 November 2009

DOI: 10.1259/bjr/47170465

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A uterus-like mass is composed of uterine smooth muscle and endometrial tissue and has a gross morphology similar to that of the uterus [1]. This mass is a rare benign tumour of the female pelvis. The ovary is the most common site for a uterus-like mass [2], but this tumour can occur in various locations, such as the small bowel, small bowel mesentery, uterine cervix, uterosacral ligament and broad ligament [3–7]. The majority of previous reports have concentrated on the pathological features of the uterus-like mass [2–7]. To date, there have been no radiological reports concerning CT imaging of a uterus-like mass. Here, we present the CT findings associated with a uterus-like mass in the sigmoid mesocolon, together with the differential diagnoses.

Case report

A 31-year-old woman presented with a complaint of low abdominal pain with a duration of 6 months. No change in bowel habit was noted. On physical examination, tenderness or rebound tenderness was not noted. Multidetector CT (MDCT) was performed for further evaluation. On non-enhanced CT (Figure 1a), an ovoid soft-tissue mass was noted in the pelvis. Contrast-enhanced axial and coronal reformatted CT images (Figure 1b,c) demonstrated a well-defined, markedly enhancing soft-tissue mass with central cystic change adjacent to the sigmoid colon. The central cystic portion of the mass was measured at approximately 40 HU on the non-enhanced CT image, representing a haemorrhagic component (Figure 1a). No anomalies of the female genital or urinary tract were noted. Preoperatively, the mass was diagnosed as a gastrointestinal stromal tumour (GIST) with cystic degeneration.

The patient underwent laparoscopic sigmoidectomy, including removal of the mass. On pathological examination, the mass, which measured about $3 \times 2.5 \times 2.3$ cm in size, was found to be attached to the sigmoid mesocolon. The sigmoid colon demonstrated no abnormalities and the mass was separated from the colonic wall by 1.5 cm. The cut surface of the mass (Figure 1d) demonstrated a pear-shaped soft-tissue mass with a central cystic portion that was filled with a dark brownish-coloured haemorrhage. Gross morphology findings were quite similar to those of a miniature uterus. On microscopy, a thick smooth muscle layer lined with endometrial stroma and glands was noted. Haemosiderin deposition was noted in the endometrial stroma and glands. These findings were consistent with a uterus-like mass in the sigmoid mesocolon. When compared with the CT imaging, the smooth muscle layer coincided with the enhancing portion of the mass, and the endometrial central portion coincided with the haemorrhagic central cystic portion of the mass.

Discussion

There is a need for clarification of the terminology used to describe uterus-like masses. An adenomyoma is a benign tumour typically originating in the uterus and is composed of smooth muscle, endometrial glands and stroma [8]. Adenomyomas can be distinguished from adenomyosis by their sharp margin [9]. Extra-uterine adenomyomas are rare [8]. Uterus-like masses are also composed of smooth muscle, endometrial glands and stroma but can be distinguished from adenomyomas by their organ-like arrangement, consisting of a single central cavity lined by endometrial mucosa with surrounding myometrial tissue [10]. Uterus-like masses can also be distinguished from endometriosis by their characteristic prominent smooth muscle component and uterus-like morphology [8, 9].

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(a)

(b)

(c)

(d)

Figure 1. A uterus-like mass in a 31-year-old woman. (a) The non-enhanced CT scan demonstrated an ovoid soft-tissue mass (arrow) in the pelvis. The central portion of the mass (arrowhead) had a CT density number ranging from 30 to 45 HU, averaging 40 HU. (b) The contrast-enhanced CT scan demonstrated a well-defined, markedly enhancing soft-tissue mass (arrow) with cystic change in the central portion (arrowhead). The mass was located adjacent to the sigmoid colon (S). (c) On the coronal reformation CT image, the shape and degree of contrast enhancement of the mass (arrow) were similar to those of the uterus. Multiple small uterine leiomyomas were also noted. (d) Pathological examination demonstrated a well-defined pear-shaped, soft-tissue mass (arrow) in the sigmoid mesocolon. The central portion of the mass demonstrated cystic changes and was filled with a dark brownish-coloured haemorrhage (arrowhead). In gross morphology, the mass was quite similar to that of the uterus. Smooth muscle, endometrial glands and stroma were identified on microscopy (not shown).

The uterus-like mass was first reported in 1981 by Cozzutto [1]. Uterus-like masses arise primarily in the ovaries [2], but they can occur in other locations including the small bowel, small bowel mesentery, uterine cervix, uterosacral ligament and broad ligament

[3–7]. Three theories on the histogenesis of the uterus-like mass have been proposed. The Müllerian duct defect theory holds that a developmental anomaly during the formation of the female genital tract leads to this tumour. The uterus-like mass may result from either a Müllerian

duct fusion defect or a partial duplication of the Müllerian system [11]. The metaplasia theory holds that the tumour arises from subperitoneal mesenchymal cells that are capable of duplicating Müllerian duct structures [7]. It may be a hormone-dependent lesion and a form of endometriosis. Finally, the heterotopia theory was proposed by Peterson et al [3]. According to this theory, the tumour is neither a congenital anomaly nor a metaplasia. The present case had neither uterine anomalies related to Müllerian fusion defects nor other genitourinary anomalies. Therefore, it seems to be consistent with the metaplastic theory.

There have been few descriptions of the imaging characteristics of uterus-like masses. Menn et al [12] described the MRI appearance of a uterus-like mass arising from the uterine wall. It is, however, difficult to appreciate the organoid features of the mass on MRI, and the differentiation of this entity from a possible adenomyoma is not clear upon MRI. Redman et al [8] described the CT features of a uterus-like mass as a large, heterogeneous, solid pelvic mass on the side of the vaginal cuff. Kaufman et al [13] briefly described the CT features of a uterus-like mass as an enlarged unilateral uterine horn and mass adjacent to the external iliac vessels. The CT features described in these two papers were ambiguous and in need of clarification. In the present case, the uterus-like mass was attached to the sigmoid mesocolon. On CT, the appearance of an ovoid, well-defined, markedly enhancing thick layer with a central haemorrhagic cystic area was similar to that of a miniature uterus.

The differential diagnoses for the uterus-like mass should include GIST and neurogenic tumours, such as schwannomas. Some GISTs originate primarily in the mesentery or omentum and are unrelated to the gastrointestinal tract. Most GISTs demonstrate heterogeneous enhancement and may have a cystic-necrotic component, including haemorrhage [14]. A schwannoma may appear as a well-defined round or oval mass that often demonstrates prominent cystic degeneration and calcification [15]. On contrast-enhanced CT, schwannomas demonstrate variable homogeneous or heterogeneous enhancement [15]. Morphological features similar to those of the uterus may be a useful clue to aid in differentiating a uterus-like mass from a mesenteric GIST or schwannoma.

In conclusion, a uterus-like mass is a rare tumour of the female pelvis. This tumour may be included in the differential diagnosis of a female patient who has a

well-defined, markedly enhancing soft-tissue mass with central cystic change. Morphological features similar to those of a uterus may be a clue that suggests the diagnosis of a uterus-like mass.

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