

## Endometriosis of the meso-appendix mimicking appendicitis: A case report

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Although appendicitis is largely a clinical diagnosis, on occasions diagnostic modalities may be needed to aid with the diagnosis. Despite the use of adjuncts and exploratory surgery, the diagnosis may not be clear until a histological diagnosis is achieved. Endometriosis of the appendix mimicking appendicitis is one of these diagnoses described in several case reports. Endometriosis of the meso-appendix has been described in association with intussusception of the appendix in several case reports. However, to our knowledge, endometriosis of the meso-appendix mimicking appendicitis has not been reported to date. We present the case of a 33-year-old woman with classic clinical signs and symptoms of appendicitis endorsed on computed tomography imaging. The patient underwent a laparoscopic appendicectomy with the postoperative histology demonstrating a normal appendix with endometriosis of the meso-appendix.

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### Case presentation

A 33-year-old woman presented to us with a past history of infertility for which she had had several unsuccessful *in vitro* fertilisation attempts. No diagnostic laparoscopies were undertaken for infertility. She presented with gradual onset of peri-umbilical pain that localised to the right iliac fossa. Pain onset had been about 4 hours prior to presentation and was associated with nausea. On examination she was hot to touch but afebrile with guarding and rigidity localised to the right iliac fossa. The white blood cell count revealed a leucocytosis of 16 000. A pregnancy test and urine examination were both negative. A diagnosis of appendicitis was entertained; however, in light of her gynaecological history, a computed tomography (CT) scan was performed. The CT scan revealed a mildly enlarged appendix (measuring 8.2 mm in cross-section), with rim enhancement and minimal surrounding fat stranding, with no other evident intra-abdominal pathology (Figs 1 and 2). The CT scan features were suggestive of that of an early

appendicitis. At laparoscopic appendicectomy the appendix looked mildly inflamed (Figs 3 and 4). The rest of the abdomen was pristine except for a reddish brown area on the uterus which was suggestive of endometriosis and was biopsied. The postoperative course was unremarkable; the presenting pain improved drastically and the white blood cell count returned to normal. Histology of the biopsy from the uterus confirmed endometriosis. No signs of appendicitis



Fig. 1. Axial CT scan. Red arrow demonstrates mildly thickened appendix (8.2 mm in cross-section).

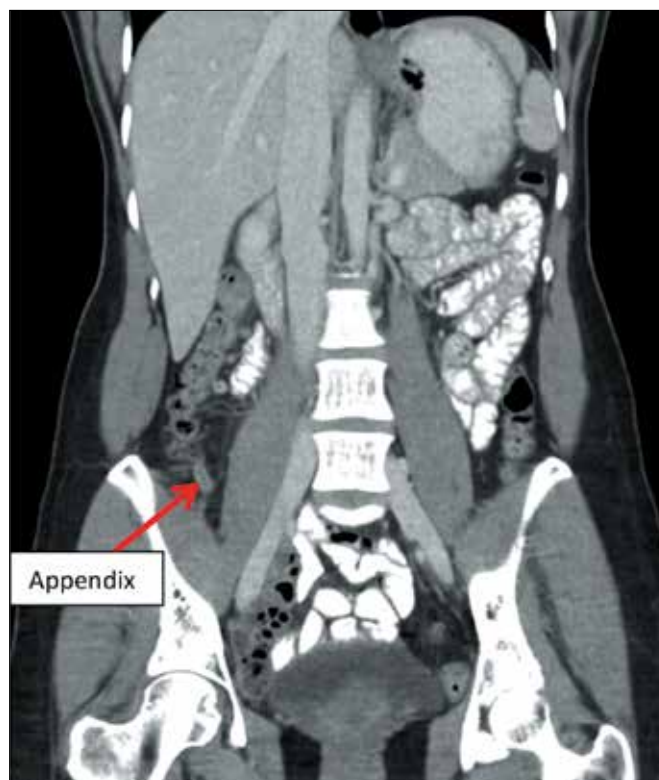


Fig. 2. Coronal CT scan. Red arrow demonstrates appendix with rim enhancement, mildly thickened wall (2.5 mm) and minimal surrounding fat stranding.



Fig. 3. Laparoscopic view of inflamed, thickened-looking appendix.



Fig. 4. Laparoscopic view of dissected appendix together with meso-appendix.

were noted in the appendix; however, endometriosis was noted in the meso-appendix.

## Discussion

Acute appendicitis is the leading cause of acute abdominal pain and abdominal surgery worldwide. The aetiology of acute appendicitis is due to obstruction of the lumen of the appendix, most commonly by a faecolith or lymphoid hyperplasia. Histological diagnosis for true appendicitis requires the presence of neutrophilic infiltration of the muscularis mucosa.<sup>[1]</sup> A host of conditions can mimic appendicitis, namely protozoan infections (amoebiasis, schistosomiasis, ascariasis, enterobiasis), tuberculosis, mucocèles and carcinoid tumours. Endometriosis ranks eighth among conditions mimicking appendicitis.<sup>[2]</sup> The meso-appendix is the part of the appendix that contains the blood vessels, nerves and lymphatics that supply and drain the appendix. It is also referred to as the mesentery of the appendix, and is usually uninvolved in appendicular pathologies.

Endometriosis is defined as the presence of endometrial glands and stroma outside the uterine cavity.<sup>[3]</sup> The exact aetiology and pathogenesis of endometriosis are unknown. The two main hypotheses proposed for the development of endometriosis are multipotential mesenchymal cells undergoing metaplasia into endometriosis and endometrial cells being implanted from retrograde menstruation through the fallopian tubes.<sup>[4]</sup> Endometriosis is most commonly found in the gynaecological organs and pelvic peritoneum but may also involve the gastrointestinal

system, greater omentum, surgical scars and the mesentery; it is rarely found at distant sites such as the kidney, lungs, skin and nasal cavity.<sup>[5]</sup> Gastrointestinal tract endometriosis occurs in 3 - 37% of all cases of endometriosis. Appendiceal endometriosis accounts for about 3% of all gastrointestinal endometriosis and <1% of all cases of endometriosis.<sup>[6]</sup>

The diagnosis of endometriosis is made on histological evaluation with findings of endometrial glands and stroma. Intestinal endometriosis often affects the serosa and subserosal layers, but can occasionally be found in the muscularis propria, submucosa and mucosa.<sup>[7]</sup> Clinically, a third of patients with endometriosis may be asymptomatic; however, the majority are symptomatic with gynaecological symptoms ranging from chronic pelvic pain, dysmenorrhoea, dyspareunia, irregular or heavy menstrual periods and infertility.<sup>[8]</sup> Gastrointestinal endometriosis presents as rectal bleeding, abdominal cramps, change in bowel habits, and bowel obstruction. Appendiceal endometriosis presents as acute right iliac fossa pain mimicking appendicitis, lower gastrointestinal bleeding or appendiceal intussusception. There are reports of meso-appendiceal endometriosis presenting as appendiceal intussusception but none presenting as acute appendicitis.<sup>[9]</sup> This case study, to our knowledge, is the first report of endometriosis of the meso-appendix presenting as acute appendicitis.

The reasons for endometriosis of the appendix or meso-appendix without pathological signs of appendicitis and lumen obstruction presenting as typical acute

appendicitis are not known; oedema and inflammation of the serosa and surrounding peritoneum may be implicated. However, obstruction of the lumen from an endometrioma or haemorrhage of endometrium in the submucosa are possibilities for concomitant pathological findings of both appendicitis and endometriosis of the appendix.

In a review<sup>[10]</sup> of 4 670 appendectomy specimens, 14 cases of endometriosis of the appendix were identified. Of these, 5 (35.7%) had coexistent appendicitis and 7 (50.0%) had evidence of endometriosis only.<sup>[10]</sup>

## Conclusion

The preoperative diagnosis of appendiceal endometriosis is almost impossible, but should be suspected in patients with infertility or cyclic right iliac fossa pain. The diagnosis should also be suspected on colonoscopy in patients with inverted appendices or a bulbous appendiceal orifice. The investigation of choice in patients suspected with endometriosis is laparoscopy, and if there is appendiceal involvement, an appendectomy is warranted. A patient who has undergone appendectomy with a histological diagnosis of endometriosis requires referral to a gynaecologist for further management.

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