Introduction

Endometriosis is a common gynecologic disorder characterized by ectopic endometrial tissue growth outside the uterine cavity. Although usually occurring in pelvic organs, endometrial lesions may involve urinary tract. Renal endometriosis is extremely rare and it has only occasionally been reported in the past. We report two cases of patients with renal cystic lesions, incidentally found at imaging techniques during oncologic follow-up for gastric sarcoma and melanoma, initially misinterpreted as complicated haemorrhagic cysts and then histologically characterized as renal localizations of extragenital endometriosis.

Case presentation

Case 1

In January 2014, a 40-years-old woman was admitted to our University Hospital “P. Giaccone”, Palermo, Italy for further investigation about a gastric ulcerated neoformation discovered and biopsied during endoscopy...
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performed for dysphagia and bleeding (11). The patient previously underwent a laparoscopic left ovariectomy because of ovarian endometriosis. At the time of hospital admission, there was no history of abdominal pain or gross haematuria. Furthermore, the menstrual pattern was normal and there was no history of recent dyspareunia, dysmenorrhea, or leucorrhoea.

The ultrasonography (US) of the abdomen showed some cystic formations in the left kidney, not reported in abdomen US performed two years before. Then, contrast enhanced Computed Tomography (CECT) of abdomen was performed. It showed a small (maximum diameter 2.5 cm) gastric polypoid lesion with a slight and homogeneous contrast enhancement located in the antrum, appearing suspicious for tumor of stomach. CECT showed also multiple hyperattenuating nodular cortical lesions (maximum diameter 1.8 cm), contiguous among themselves with “bunch of grapes” appearance, both in upper and mid poles of the left kidney (Figure 1 A, C). On the arterial and portal venous phases, despite the evaluation of different areas of interest within the lesions, it has never been observed significant enhancement of the renal lesions themselves (Figure 1 B). These were considered compatible with hemorrhagic cysts but it was not possible to exclude other diagnosis. Hystopathology of the gastric tumor revealed an advanced gastric cancer and a Magnetic Resonance (MR) of the abdomen was performed in order to characterize the renal findings, revealing left renal cortical lesions, tending to confluence, hyperintense on T1-weighted images and with low signal on T2-weighted images. No significant enhancement was demonstrated on post-contrast phases (Figure 2). However, due to the medical history of gastric cancer, after a multidisciplinary discussion between oncologists, surgeons and radiologists, a CT-guided biopsy was suggested.

Case 2

In September 2016, a 39-years-old woman with newly diagnosed skin melanoma was admitted to our Department of Radiology for staging work-up. Since the age of 22, the patient had suffered from ovarian endometriosis, successfully regressed after 8 years of treatment with hormonal therapy. At the time of diagnosis of melanoma, there was no history of abdominal pain or gross hematuria.

Figure 1 - 40-years-old woman with renal endometriosis - Technique: Abdominal CT scans (120 kV, modulated mA, 0.6 mm slice thickness, 80 ml of Ultra-vist 370) - Findings: A: Axial unenhanced CT image shows multiple hyperattenuating lesions (maximum diameter 1.8 cm, 67 HU) (arrow). A simple cyst coexists on the mid pole (maximum size of 2.4 cm) (curved arrow). B: Axial contrast enhanced CT image on corticomedullary phase demonstrates slight enhancement of the renal lesions (80 HU) interpreted as “pseudoenhancement” (arrow). C: Coronal reformatatted unenhanced CT image of the abdomen depicts multiple hyperattenuating renal lesions in upper and lower poles of the left kidney, contiguous among themselves with “bunch of grapes” appearance, related to endometriotic lesions (arrow).
CECT of the abdomen showed a left kidney reduced in size (maximum diameter 8 cm), with multiple millimetric spontaneously hyperattenuating cortical lesions, contiguous among themselves with "bunch of grapes" appearance, with no significant enhancement after contrast medium injection (Figure 3) considered as hemorrhagic cysts. However, medical history of skin melanoma led the clinicians to request a CT-guided biopsy to exclude the diagnosis of renal metastases.

In both patients, a CT-guided biopsy of renal lesions was performed: in both cases, pathological examination revealed fibrocollagenous cysts lined by endometrial epithelium, glands and stromal tissue, along with areas of haemorrhage, hemosiderin and macrophages. Immunohistochemistry showed both stromal and epithelial cells were focally positive for estrogen (ER) and progesterone receptors (PR). Based on these features, a diagnosis of endometriosis involving the left kidney was given. Patients were asymptomatic and did not need any hormonal or surgical therapy for renal lesions. During the follow-up, 6 months after the first imaging examination, no clinical changes occurred, neither hematuria in the urinalysis or modification of CECT findings.

**Discussion**

The pathogenesis of endometriosis is controversial and includes ectopic transplantation theory, metaplasia of coelomic epithelium, autoimmunity, blood-lymphatic embolism and embryonic theory (12). Renal endometriosis is an extremely rare find of this disease, which may remain asymptomatic for several years and discovered incidentally, although it might present as vague nonspecific symptoms (13). The presence of genitourinary symptomatology depends on the extent, depth and location of the ectopic endometrium: this cyclically thickens and sheds in response to the changing levels of ovarian sex hormones, resulting in the growth of fibrous tissue and formation of the endometrioma in the kidney. Repeated periodic bleeding may lead to hemorrhagic cysts, that gradually increase in the renal tissue or invade the renal capsule, causing abdominal pain (6). Gross haematuria is clinically manifest when the lesions break into the renal calyces, while blood clots and deciduous endometrium may cause ureteral obstructions, which may evoke renal colic pain (13). Rarely, renal endometriosis can result in asymptomatic kidney dysfunction if a large endometriotic lesion involves directly
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The absence of symptoms was probably related to the fact the endometriotic lesions were confined within the renal cortex with no involvement of the calyces. An early diagnosis of renal endometriosis is primarily dependent on the knowledge of a medical history of endometriosis. Persisting urinary symptoms in women with endometriosis or undergone gynaecological surgery, should suggest the diagnosis of urinary tract endometriosis. However, cyclic hormonal changes may affect both stromal and glandular components in endometriosis, making the radiological and pathological interpretation challenging.

The imaging features of renal endometriosis do not facilitate accurate diagnosis. Although US is useful to differentiate solid from cystic lesions and contrast enhanced US increases the accuracy of the examination in the evaluation of lesions of the urinary tract (14), US provides just little diagnostic information to identify renal endometriosis.

CECT is commonly helpful to detect extragenital endometriosis. Renal endometriosis is usually located in the parenchyma and may have the appearance of multilobular cyst, polypoid bulge or just scar tissue deformity. Unenhanced CT may show lesions of several size, from a few millimetres to 3 cm in diameter, with clear and irregular borders. Lesion density is usually uniformly hypodense, but it changes with the menstrual cycle. When ectopic endometrium bleeding occurs during the menstrual period, the density of lesions may increase or appear uneven. Renal cysts show attenuation value between 0 and 20 HU on unenhanced CT, while renal masses with 20-70 HU values (“danger zone”) require further investigation, since renal cell carcinomas have typically these attenuation values (15). Moreover, renal lesions with HU values greater than 70 HU on unenhanced CT are cystic lesions with haemorrhagic content in 99% of cases (15). Furthermore, it is possible to observe a “pseudoenhancement” (15), an increase in attenuation values between 10 and 20 HU as a consequence of beam hardening, as we observed in our cases. CECT may show enhancement in the central part of endometriotic lesions and enhancement in the surrounding proliferative fibromuscular tissue (13).

MR imaging, compared to CT, despite the higher costs and longer acquisition times, shows superior contra-
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with patients’ menstrual cycles, may lead to the adoption of medical approaches, including hormonal therapies such as GnRH agonists and oral contraceptives, while surgical therapeutic strategies, in particular laparoscopic management, should be considered for large renal endometriomas or persistent obstructive uropathy (6, 27, 28). These surgical procedures should be performed by a surgical team experienced in general, gynaecological, adrenal and urological laparoscopic surgery also in urgency setting because we well know the possible intraoperative complications of this kind of surgery as bowel, bladder, ureteric and vascular injuries (29-35).

Conclusion

Our cases are two examples of asymptomatic patients with history of ovarian endometriosis and incidental detection of renal endometriotic lesions, subsequently histopathological examined. These patients do not need any therapy for renal lesions being asymptomatic and unchanged on the subsequent imaging examinations. From literature data most of the previously reported examples of endometriosis of kidney are found in symptomatic patients.

In conclusion, renal endometriosis is a rare entity that may be asymptomatic or clinically controversial and the diagnosis is possible only in presence of an appropriate clinical assessment. CECT and MR may be helpful in staging the disease process and for differential diagnosis from other blood containing lesions, although definitive diagnosis requires histological confirmation by identifying endometrial glands and stroma within the renal lesions.

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References


