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Imaging of an exceptional urinoma complicating a cervical cancer and leading to death: A case report

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Abstract

Spontaneous urinoma is a rare urological complication that can occur following acute urinary obstruction. It involves a collection of urine that typically forms around the kidney as a result of rupture of the fornix. There are several causes of acute urinary stasis, including lithiasis, tumors, prostatic hypertrophy, and others. We present a unique case of an asymptomatic spontaneous urinoma discovered incidentally during the extension study of a 66-year-old woman with cervical cancer. The positive diagnosis was made through a combination of ultrasound and uro-computed tomography scan. The evolution was marked by the occurrence of a uremic encephalopathy, leading to death before any treatment.

Keywords

Spontaneous urinoma, cervical cancer, uro-CT-scan

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Introduction

Urinoma is a collection of urine around the kidney caused by a rupture of the renal fornix resulting from an abrupt increase in pressure in the urinary tract. This acute urinary stasis can occur secondary to several factors, mainly a stone, posterior urethral valves, prostatic hypertrophy, and neoplasms.[1] Traumatic and iatrogenic causes are also recognized etiologies. We report a spontaneous, large urinoma following ureterohydronephrosis in a patient with cervical cancer. Ultrasonography is the first-line imaging modality to set the diagnosis. However, when large, chronic, or complicated, it may cause a differential diagnosis problem requiring cross-sectional imaging. We describe the particularities of the radiological findings on ultrasound (US) and uro-computed tomography (CT) scans of such urinomas.

Case report

A 66-year-old female with no medical history presented to gynecological consultation with isolated uterine bleeding for 6 months. The clinical examination revealed a tumor of the cervix, which was confirmed by biopsy to be a well-differentiated squamous cell carcinoma. A thoraco-abdomino-pelvic CT scan was performed as a part of an extension assessment and showed a huge retroperitoneal right-sided abdominal-pelvic cystic mass exercising a mass effect on the homolateral kidney against the anterior abdominal wall. The mass had well-defined, regular contours with a thin wall and a dense fluid content with multiple thin septa that enhanced faintly after injection of contrast medium (Figure 1). Delayed acquisitions performed at 15 min and 2 h after revealed a slow, progressive, and partial filling of the mass by the contrast medium (Figure 2). Ultrasonography showed an anechogenic cystic mass containing multiple fine septa with a fishnet-like appearance (Figure 3), indicating chronicity of the urinoma and the origin of its partial, heterogeneous filling. In addition, there was bilateral ureterohydronephrosis with a 17 mm pylon on the left side of the cervical tumor and a 51 mm pylon on the contralateral side, explaining the delayed excretion. Upon discovery of this mass, the patient was urgently referred for a urological consultation. A blood test was performed and

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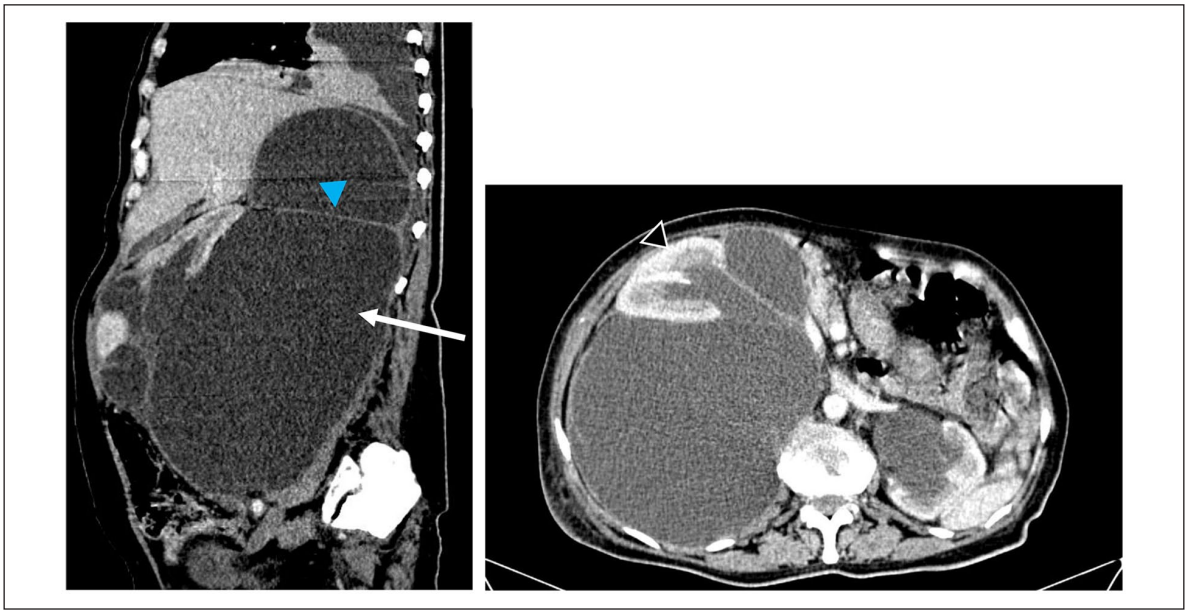

Figure 1. Sagittal and axial abdominopelvic computed tomography-scan in parenchymal phase: Pure liquid retroperitoneal mass (arrow) pushing the kidney against the anterior abdominal wall (black arrowhead). Note the well-defined thin septa (blue arrowhead).

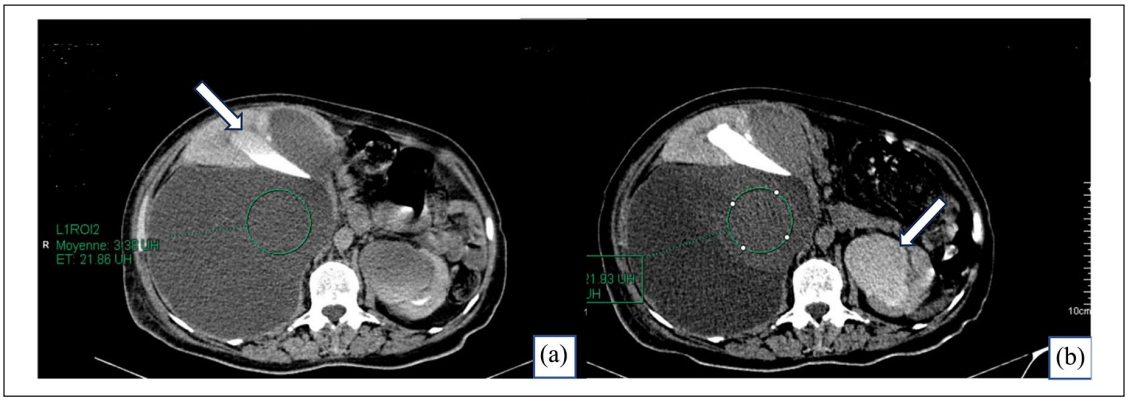

Figure 2. Axial abdominal computed tomography-scan in delayed phase performed at 15 min and 2 h: Bilateral pelvic dilation more pronounced on the left (arrows). At 15 min (a), the measured density was 3.3 Hounsfield Units (HU), increasing 2 h later to 22 HU, proof of a slow and progressive filling of the fluid mass by the contrast agent (b).

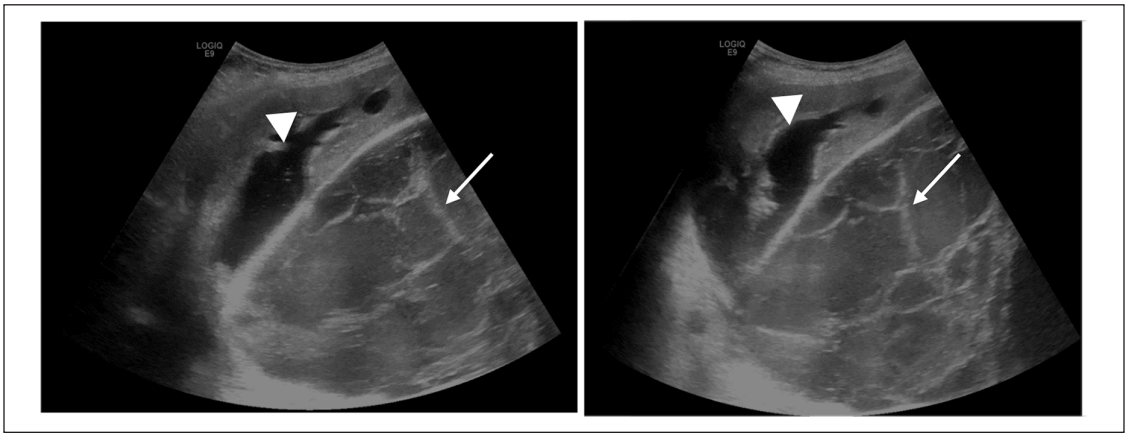

Figure 3. Ultrasound showing a thin-walled anechoic cyst containing multiple septa (arrow), displacing the kidney forward. Note the pyelo-calyceal dilation (arrowhead).

showed elevated levels of uremia and creatinemia with an estimated glomerular rate of 11 ml/min associated with mild hyperkalemia without electrical changes and leukocytosis. The case was discussed in a multidisciplinary consultation, and percutaneous nephrostomy was considered. However, the patient began to suffer from uremic encephalopathy, requiring intensive care unit, where she died despite efforts to restore proper renal function and treat her sepsis.

Discussion

A urinoma is a collection of urine that accumulates in the retroperitoneal and perirenal space following rupture of the fornix. Spontaneous urinoma is a rare urological complication that occurs due to a sudden increase in pressure in the urinary tract, while post-traumatic and iatrogenic urinomas constitute a distinct entity. Several factors can cause spontaneous urinomas, including stones,[1] posterior urethral valves, prostatic hypertrophy, urological and gynecological cancers, pyeloureteral junction syndrome, and retroperitoneal fibrosis. It may be asymptomatic or present with non-specific symptoms such as simple back pain. Spontaneous urinoma with no underlying cause is a very rare condition reported in many cases in the literature.[2]

Urinomas are classified into several types based on their location, including localized perirenal urinoma, the commonest one, diffuse perirenal urinoma, subcapsular urinoma, and intrarenal urinoma.

US is the first-line imaging tool to diagnose urinoma. It presents as a thin-walled, echogenic, cystic peri-renal mass with posterior enhancement. The content may be purely liquid or contain thin septa, indicating chronicity, as in our case. Infection of the urinoma is characterized by mobile intraluminal echoes or thick, heterogeneous content with associated pyuria.[3] In such cases, US allows simple and effective therapeutic drainage. It also assesses the state of the renal parenchymal status, the calculus, and the resulting pyelocalyceal dilation. This pelvicalyceal dilation may regress when urinoma has already appeared due to its perforation, so it is not mandatory to assess it at the time of diagnosis. A large urinoma may cause the kidney to move forward and be mistaken for ascites, retro or intraperitoneal cystic masses, or other differential diagnoses. This is why CT is recommended in such cases.

A CT scan is the exam of choice to set diagnosis of urinomas and to rule out differential ones. A non-contrast acquisition is used to measure the spontaneous density of the content and to highlight a hemorrhagic complication as hyperdensity. Injection of a 100–150 ml bolus of iodinated contrast agent, preferably with a concentration of 300 mg/ml, at a rate of 2–3 ml/s per kilogram, followed by a nephrographic-phase acquisition at approximately 80 s, is useful for studying kidney status, ureteral and urinoma wall enhancement. Additionally, the overall viscera can be analyzed to eliminate all differential diagnoses. The delayed excretory phase is the key image to diagnose urinoma. It should preferably be obtained at 10 min, sometimes up to 20 min. Another acquisition may be necessary because of the delayed excretion usually present in these patients due to underlying urinary stasis. The excretory phase shows progressive filling of the urinoma by the contrast agent and confirms its communication with the excretory pathways. The disadvantage of CT is the radiation exposure; thus, the radiologist must choose the most cost-effective and the least irradiating protocol for the patient.[4]

Magnetic Resonance Imaging (MRI) has the advantage of being non-radiating and having better contrast resolution. Due to a lesser availability, it is reserved for pregnant women, children, and in cases where there is a contraindication to the injection of iodinated contrast agents. The examination includes standard sequences in T1 and T2 weighted images, T1WI after injection of Gadolinium, MRI urography sequences (uro-MRI) to visualize dilated excretory pathways without the use of contrast agents, and a cine-MRI sequence to confirm a positive diagnosis in cases of ureteral stenosis. The sensitivity of MRI in the diagnosis of urinary tract obstruction is around 86.8%, which can be improved by the injection of diuretics in the absence of contraindications. However, MRI may be affected by artifacts generated by the presence of metallic clips. In addition, the detection of urinary leakage on MRI is difficult in the absence of sequences performed after the injection of contrast agents.[5]

In our case, the urinoma has been incidentally discovered. Even though, it was of huge volume with a quick alteration of the renal function leading to a uremic encephalopathy of which the proposed mechanism is an accumulation of neurotoxins with no clear identified pathway. The consequences are a dysregulation of blood pressure through the damage of rostral ventrolateral medulla, and an oxidative stress leading to mitochondrial dysfunction.[6] The aim of the conduct was to stabilize the patient and get out of the emergency by treating the encephalopathy, hence, the hospitalization in unit care and the start of dialysis. Yet, the comorbidity of cervical cancer, the important blood loss, and the associated clinical state led to a coma of the patient and to death.

Differential diagnoses of a cystic structure adjacent to the kidney include lymphangioma, hemorrhagic renal neuroblastoma, mesenteric cyst, enteric duplication cyst, polycystic kidney disease, cystic tumor of the kidney, and ureteral duplication. A complicated urinoma can simulate an abscess or a hematoma.

The therapeutic modalities are diverse and are chosen on a case-by-case basis depending on the etiology of the urinary stasis, the presence of infection, and the condition of the renal parenchyma. Therapeutic options include conservative management, placement of a JJ catheter, endoscopic procedures, percutaneous nephrostomy under US or CT guidance, percutaneous drainage, and finally, surgical treatment.[7–9]

This case highlights the need for close monitoring of renal function in patients with cervical cancer. Even if these urinomas are asymptomatic, repetitive blood tests as

well as renal US would be more effective, at least in patients with large cervical masses or histological subtypes with a poor prognosis. This attitude will prevent patients from reaching advanced stages where therapy is no longer effective.

Conclusion

Spontaneous urinoma is a complication that may occur in the case of any acute and significant urinary obstruction. Radiologists must be familiar with its different imaging aspects, complications, and especially the differential diagnoses. The patient's medical history, urinary stasis, and abdominopelvic CT scan with late sequences are key elements for positive and differential diagnosis.

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Author contributions

All authors participated actively in elaboration of this scientific document: The A.H., H.A., set diagnosis and wrote the manuscript. The H.E. was the physician in charge of the patient and helped elaborating the manuscript. The H.A., A.E.B., S.A., Y.O., and R.L. set the diagnosis and revised the text.

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Ethics approval

Our institution does not require ethical approval for reporting individual cases or case series.

Informed consent

Informed consent has been obtained from the patient before referring her to the urology department, as well as from her family after death.

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