CASE REPORT

Magnetic resonance imaging for ureteral fibroepithelial polyp

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Ureteric tumours are rare and most of them are malignant. Of benign tumours, ureteral fibroepithelial polyps are the most common but are still considered clinical rarities. In the past, most benign ureteric tumours were only diagnosed after surgical removal. With technological advance, magnetic resonance imaging has become an effective means of assessing ureteric lesions. Non-contrast enhanced magnetic resonance urography can produce an image comparable to an intravenous urogram without use of intravenous water-soluble contrast. A polyp can be diagnosed on imaging if there is an elongated filling defect inside the ureter. Nevertheless, a definitive diagnosis relies on ureteroscopic examination with biopsy. When a non-obstructive polyp is being managed conservatively, imaging is helpful for monitoring. Equally, the information obtained from imaging can be used to plan operative treatment.

Introduction

Primary ureteric tumours are uncommon and only about 20% are benign. Fibroepithelial polyps are rare ureteric tumours, despite being the most common non-epithelial ureteral lesions. As most ureteral tumours are malignant, fibroepithelial polyps are commonly misdiagnosed before surgery. Imaging can help confirm and assess a ureteric lesion. Specific features seen on imaging may help to diagnose a ureteral polyp preoperatively. In the past, an intravenous urogram (IVU) was the most commonly used imaging examination but magnetic resonance imaging (MRI) can now assess ureteric lesions more comprehensively. We report the MRI assessment of a patient with a ureteral fibroepithelial polyp.

Case report

A 37-year-old Chinese woman presented to an orthopaedic surgeon complaining of low back pain in February 2006. Magnetic resonance imaging of her lumbosacral spine was performed in August 2006 and it showed hydronephrosis of the left kidney; in view of this finding an MRI of the abdomen was performed during the same session. A proximal left ureteric tumour lesion with resultant left hydronephrosis was found (Fig 1). A paraspinal tumour mass in the left upper abdomen was also noted. The patient was then referred to a surgeon for further management. An IVU was done in September 2006 (Fig 2), and a left proximal ureteric tumour lesion was again demonstrated. Ureteroscopic examination and biopsy of the mass was then performed, and a pathological examination of the specimen indicated that it was a fibroepithelial polyp. Examination of a computed tomography

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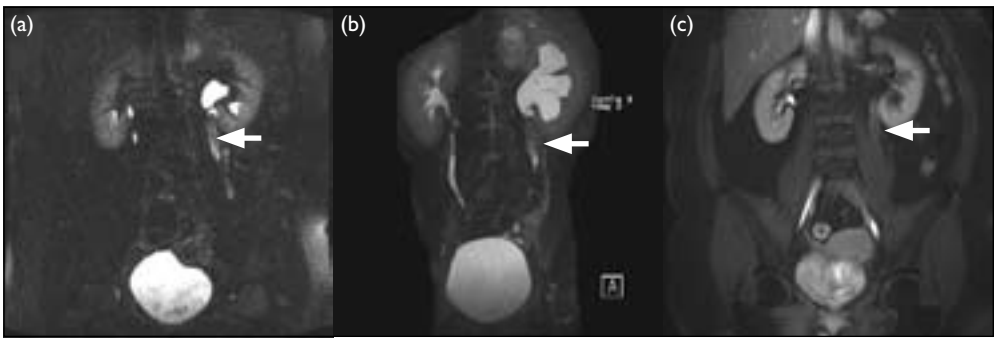

FIG 1. (a) Coronal thin section of T2-weighted image showed the ureteric tumour as a low-signal filling defect at the proximal left ureter (arrow). (b) Maximum intensity projection of magnetic resonance urography demonstrated a proximal left ureteric tumour (arrow) causing left urinary obstruction and left hydronephrosis in contrast to the normal urinary system on the right side. (c) The hypointense left ureteric tumour was also well shown in this coronal post-gadolinium T1 image (arrow). The bright signal from excreted contrast is noted in the right renal pelvis and distal ureters on both sides

(CT)–guided biopsy of the left upper paraspinal mass indicated that it was a schwannoma. Surgical resection of the left ureteral fibroepithelial polyp and left upper paraspinal schwannoma was performed in November 2006. The patient recovered well after the operation.

Discussion

Ureteric tumours are rare and usually malignant. Although fibroepithelial polyps are the most common benign lesions, they are still considered clinical rarities.[1] Fibroepithelial polyps consist of fibrous and vascular tissue covered with normal transitional epithelium. They are most commonly located in the left proximal ureter as in our case[2] and are seen in both adult and paediatric patients. The aetiology of the neoplasm is not certain; congenital causes and chronic inflammation are both postulated as contributing to the pathogenesis of the lesion.[1,3] Variable clinical presentations have been seen, but they usually involve urinary symptoms such as flank pain, haematuria, and dysuria. Our patient presented with low back pain and experienced partial resolution of this a few months after the operation. Her polyp could be considered an incidental MRI finding, as the examination was performed to assess her lumbosacral spine rather than a ureteric lesion. On the other hand, her low back pain may have been at least partly caused by the lesion. All in all, as there were no obvious urinary signs and symptoms, the pathology was not suspected clinically before the MRI examination.

Ureteral fibroepithelial polyps can be assessed using various imaging techniques. Imaging helps diagnose and define the location of the lesion. In the past, IVU was the principal means of assessing a ureteric lesion radiologically and in fact an IVU was also requested in our case because the surgeon was not familiar with MRI images. With the development of CT and MRI, both types of examination are increasingly used for assessment of ureteric lesions. The introduction of multi-detector row CT in the past decade has yielded a lot of new applications for this imaging examination. High-quality CT scans and the ability to perform virtual CT ureteroscopy have now become possible. Chou et al[4] reported good results when assessing fibroepithelial polyps with CT imaging. The major disadvantages of CT examination are radiation exposure to the patient and risk of a reaction to water-soluble contrast.

As with CT, significant technological advances have also been made with MRI. There has been hardware improvement with more powerful magnets, improved detector designs, and faster computers. The development of faster sequences has led to a wider application of MRI in body imaging. With its multiplanar capability and inherent contrast resolution, MRI is well suited for providing important information about a ureteric lesion. As demonstrated in this case, in a dilated or obstructed urinary system, non-contrast enhanced MR urography (MRU) was able to provide similar information as IVU and CT urography without using intravenous contrast. The technical aspects involved in non-contrast enhanced MRU are similar to those of magnetic resonance cholangiopancreatography. They are both heavily T2-weighted images, which are good for showing a structure with a high fluid content, such as urine in a ureter and bile in a bile duct. Heavily T2-weighted images can be obtained rapidly by using a fast turbo-spin echo sequence. As the images are strongly T2-weighted, most of the tissues lose their signal and become dark while the fluid remains bright because

使用磁共振成像術診斷輸尿管纖維上皮息肉

輸尿管腫瘤很罕見，且大多數都屬惡性。雖然纖維上皮息肉是輸尿管最常見的良性腫瘤，但臨床上仍屬罕見的病例。以往大部份輸尿管的良性腫瘤都是進行手術切割後才診斷出來。隨著科技進步，磁共振成像術可有效診斷輸尿管病變。用非增強磁共振尿道造影術產生的影像，可媲美靜脈腎盂造影術，而且不須使用靜脈水溶性造影劑。如果輸尿管內有極度擴張的填影缺損，憑影像圖便可把息肉診斷出來。通過輸尿管鏡檢查和活組織檢查可明確診斷。影像學不但有助監察對非梗阻性息肉進行的保守治療，所得的資料更有助計劃手術治療。

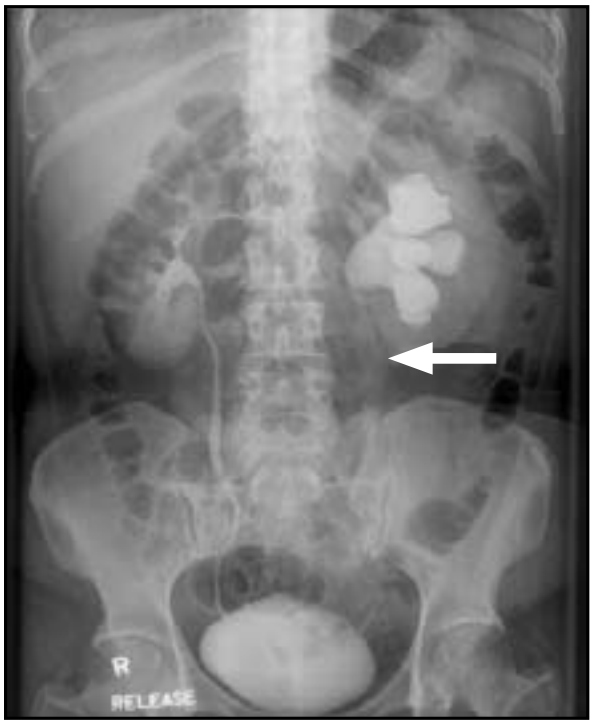

FIG 2. The intravenous urogram had similar features to the magnetic resonance imaging examination
The proximal left ureteric tumour was noted as a filling defect in the examination (arrow)

of its long relaxation time. This gives a picture of a fluid-containing structure with good contrast resolution; the ureter containing urine stands out as a bright signal structure in a dark background. The ureteric lesion is demonstrated as a filling defect as it is in an IVU examination. Our case shows that non-contrast MRU can give a quality of image and diagnostic information comparable to IVU. Moreover, with sectional images in orthogonal planes, MRI can further delineate the extent of the tumour, thus providing important information for planning operative treatment and more accurate diagnosis. Demonstration of lack of local invasion, no regional lymphadenopathy, and no distant metastases provides imaging evidence for a diagnosis of a benign ureteric lesion. The presence of urine around the filling defect, the demonstration of an attachment of the polyp, and the increased length of the ureteric mass are imaging features highly suggestive of a ureteral fibroepithelial polyp.[5] Magnetic resonance urography can also be performed with an intravenous contrast injection but the T2 dephasing artifact in concentrated gadolinium in the urine means diuretics should always be given at the same time.

In the past, ureteral polyps were usually diagnosed after surgery by pathological examination of specimens removed during an operation. When a ureteric lesion was seen on imaging, the clinical diagnosis was always the much more common malignant ureteric tumours. Therefore, when imaging suggests a polyp, a ureteroscopic examination with biopsy of the lesion should be performed. Conservative treatment with regular follow-up may be preferred for non-obstructive and asymptomatic polyps,[6] thus an accurate diagnosis can help to avoid unnecessary surgery. Imaging methods such as MRI can be used to monitor and detect any hydronephrosis developing in patients being managed conservatively. In contrast to malignant tumours, symptomatic and obstructive polyps can be treated with local resection of the lesion either by open operation or ureteroscopic removal of the tumour mass.[7] Once again, accurate diagnosis and delineation of the lesion by imaging is of great importance in the planning of surgical treatment.

In conclusion, we have presented a case of ureteral fibroepithelial polyp with an emphasis on MRI assessment. Imaging plays an important role in both the diagnosis and delineation of this lesion, which in turn informs decisions about appropriate treatment. With its multi-planar capability and high inherent contrast resolution, MRI is well suited for assessment of an obstructive ureteral polyp. Magnetic resonance urography provides good-quality images for accurate assessment of the lesion. While contrast CT provides a similar level of imaging, radiation exposure and the risk of contrast reaction are major disadvantages for patients undergoing this examination. Polyps may be suspected if there is an elongated filling defect inside the ureter. Nevertheless, a definitive diagnosis should be reached by performing a ureteroscopic examination with biopsy. A correct preoperative diagnosis helps prevent unnecessary radical surgery for a benign tumour.

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