Inflammatory myofibroblastic tumour in a female urethra: A rare benign lesion that mimics malignancy

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Abstract

Inflammatory myofibroblastic tumour (IMT) is a rare spindle tumour that mimics malignant processes. It can affect any part of the body, but rarely occurs in the genitourinary tract. We report a case of urethral IMT in a 31-year-old female. The diagnosis was established by histological findings and confirmed by immunohistochemical staining.

Introduction

Inflammatory myofibroblastic tumour (IMT) is a rare entity of vague etiology and pathogenesis.[1] It appears to be a benign process mimicking malignant processes. IMT can affect any part of the body, but is common in the lung and orbit.[2] It rarely occurs in the genitourinary tract, in which the bladder is its most common site.[3] We report a case of urethral IMT in a 31-year-old female. A Medline search revealed only 1 case.

Case history

A 31-year-old woman was referred to our clinic. She mostly complained of obstructive urinary symptoms and bloody urethral secretions for 1 month. She was married, but had no children. Her medical history was clear and she was not a smoker. Physical examination of the external genitalia was done in the lithotomy position, which revealed a round mass at the distal urethra (Fig. 1, part A). The mass was planned to be excised and therefore the patient underwent a complete resection. The mass was formed from a firm polypoid creamy tissue, 2 × 3 cm in size (Fig. 1, part C). Thereafter, cystoscopy was performed showing a normal bladder and proximal part of the urethra. The specimen was then evaluated by an experienced pathologist. Histological findings showed fascicules of spindle cells proliferation consisting of fibroblastic and myofibroblastic cells accompanied by a prominent infiltration of lymphocytes and plasma cells. In immunohistochemical staining, the spindle cells were positive for actin, desmin and anaplastic lymphoma kinase (ALK) and negative for S-100 and CK (Fig. 2). The patient was well with no complications or relapse at the 1-year follow-up.

Discussion

IMT is a rare spindle tumour which mimics malignant lesions.[4] Because of its histological heterogeneity, it has received many names over the past years, including plasma cell pseudotumor, inflammatory pseudotumor, xanthomatous pseudotumor, pseudosarcomatous myofibroblastic proliferation, inflammatory myofibrohistiocytic proliferation, atypical fibromyxoid tumor and atypical myofibroblastic tumour.[3-5] It is not clear whether IMT is benign, malignant or part of a spectrum of benign to malignant spindled soft tissue tumours. The World Health Organization continues to classify inflammatory myofibroblastic tumour as a distinct borderline lesion with uncertainty as to whether it is reactive or neoplastic in nature.[6]

IMT was first reported in the lungs and most commonly involves the lung and orbit; it can also occur in almost any location, including the abdomen, retroperitoneum, head and neck, brain and extremities. In the genitourinary tract, IMT is most frequently observed in the bladder, but has also been rarely reported in the kidneys, adrenal, prostate, ureter, epididymis and urethra. IMT has been reported in all age groups, but is much more likely to occur in young individuals. Also both sexes and all ethnic groups appear to be affected equally in other organs (e.g., lung), whereas in the genitourinary tract it has a 2:1 to 3:1 male predominance.[4]

Histologically, an IMT includes cells associated with both acute and chronic inflammation, including lymphocytes and plasma cells, myofibroblastic spindle cells, and collagen.[6]

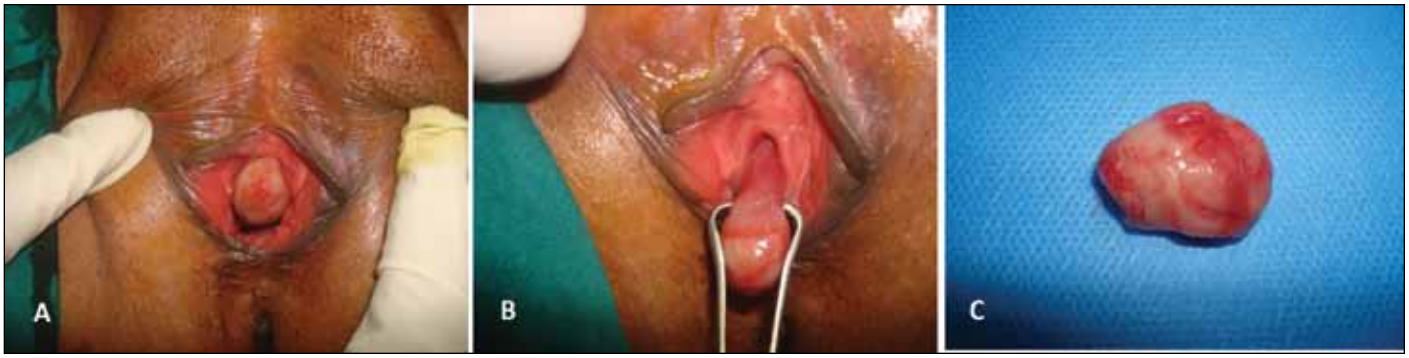

Fig. 1. A,B: A polypoid urethral mass in distal urethra C: The gross appearance of mass after excision.

Immunohistochemical features of IMT may overlap with other lesions, including malignancies.

IMT has been reported to stain positively for vimentin (95% to 100%), desmin (5% to 80%), smooth muscle actin (48% to 100%), muscle specific actin (62%) and keratin (10% to 89%). The role of ALK in differentiating IMT from other spindle cell neoplasms is very important. About half of IMTs show positive immunostaining for ALK.[4] The human ALK gene spans a region of about 728 kb on chromosome 2p23 and encodes anaplastic lymphoma kinase, a tyrosine kinase receptor and member of the insulin growth factor receptor superfamily which is normally expressed in the central nervous system. About 50% to 60% of IMTs have clonal genetic aberrations in the short arm of chromosome 2 in region p21–p23, which may support the concept of IMT as a neoplasm.[7] No histological differences have been seen between ALK positive and negative IMTs and the role of ALK in the tumour prognosis is not yet clear.[8]

Radiologic findings of inflammatory pseudotumor in the genitourinary tract (e.g., kidney and bladder) are nonspecific. Ultrasound imaging and contrast-enhanced computed tomography findings show variable patterns, whereas magnetic resonance imaging shows a hypointense lesion on T1-and T2-weighted images (possibly reflecting the fibrotic change) and shows marked gadolinium enhancement. These variable radiologic findings may be attributed to the various degrees of fibrosis, cellular infiltration, and dynamic change occurring during the inflammatory process. So although definite radiologic differentiation from malignancy is not clearly possible, manifestations of inflammatory pseudotumor and also imaging-guided biopsy can help avoid unnecessary radical surgery.[6] However, due to the specific location of urethral IMT, it seems that radiology cannot be very helpful in its diagnosis.

Patients may present with fever, weight loss, growth retardation, thrombocytosis, iron deficiency anemia, hypergammaglobulinemia, symptoms related to mass effect, or a combination of these signs and symptoms.[2] The differential diagnosis of IMT includes both benign and malignant lesions. Leiomyoma is a benign lesion which stains positively for vimentin, smooth muscle actin and desmin, similar to IMT. Also leiomyosarcoma, sarcomatoid carcinoma and rhabdomyosarcoma are malignant lesions which can be categorized in the differential diagnosis of IMT. Histologically, leiomyosarcoma and IMT may have components of spindled cells with fibrillar eosinophilic or vacuolated cytoplasm; the background stroma may be extensively myxoid and in both may include aggregates of inflammatory cells, predominantly lymphocytes and plasma cells; although leiomyosarcoma typically exhibits at least mild to moderate nuclear pleomorphism, necrosis and atypical mitotic figures. Sarcomatoid carcinoma and low-grade sarcoma can be mistaken for IMT;

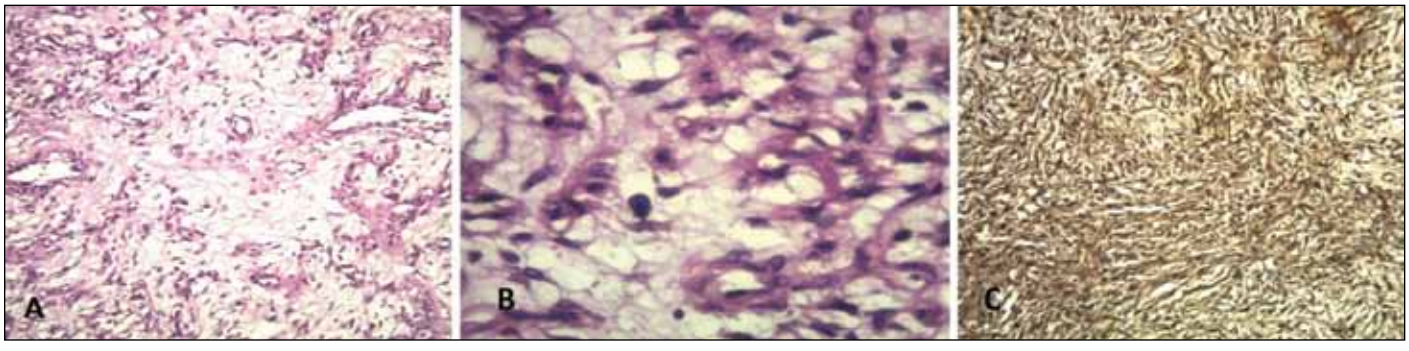

Fig. 2. A. Fibrofascicular fibroblast and myofibroblast proliferations mixed with chronic inflammatory cells (hematoxylin and eosin [H&E] staining ×40). B. Edematous stroma and chronic inflammatory cells (H&E staining ×100). C. IHC positive staining for ALK (×100).

however, immunohistochemical staining for epithelial markers such as cytokeratin, ALK immunostaining and fluorescence in situ hybridization (FISH) analysis may be valuable in the differential diagnosis. Rhabdomyosarcoma is also an important consideration in children where morphological features and positive immunohistochemical staining for MyoD1 or myogenin can help in the differential diagnosis.[4]

Typical IMTs can be locally aggressive, sometimes requiring radical surgical resection. Metastasis is not seen in typical cases with only a rare incidence of malignant transformation and remote metastasis.[5] The substantial role of IMT in the subsequent occurrence of invasive urothelial carcinoma is not yet clear. In general, recurrences are reported in 10% to 25% of genitourinary IMT cases.[4] IMT of the genitourinary tract is rare and was first described in the renal pelvis by Davides in 1972.10 Thereafter most cases were reported in the urinary bladder.[3] IMT may be associated with UTI, cigarette smoking, bladder instrumentation and gynecological surgery. Infection may also have an important role in the pathogenesis of IMT and various organisms have been cultured from IMT in different anatomical sites.[4] IMT of the bladder was first described by Roth in 1980.[11] It occurs in young adults and is more common in women. Patients can present with gross hematuria, anemia, dysuria, increased urinary frequency, and urinary tract obstruction. The lesion can have various presentations, including a polypoid enhancing intraluminal mass and a submucosal mass with or without perivesical fat involvement. In most cases, conservative surgery is adequate for cure.[2] In some cases, it is difficult to preserve urinary function at surgery, especially if the tumour has extensive bladder neck and ureteric involvement. In such cases, preoperative treatment with a cyclooxygenase 2 inhibitor may shrink the tumour before resection.[12] Renal IMTs are extremely rare and only 38 cases of IMT in the kidney were reported between 1972 and 2010, from which 54% were male, including both children and adults.

Renal IMT usually presents as flank pain and hematuria. The imaging characteristics are non-specific. Treatment is usually nephrectomy or partial nephrectomy because of the inability to differentiate these masses preoperatively from renal cell carcinoma by radiologic or pathologic means.[13] Furthermore, adrenal IMT is very rare and presents as a solid mass. The patient may suffer from endocrine symptoms, such as amenorrhea.[2,6] IMT can even present as a paratesticular or epididymal mass in which surgical resection without orchiectomy is the ideal treatment.[14] Nevertheless, IMT has been rarely reported in the ureter and prostate.[4] While reviewing the literature, only 1 case of IMT of the urethra in a female patient was found.[15]

Conclusion

Although rare, IMT should be considered in the differential diagnosis of urethral masses in female patients. Also, both the physician and patient should be aware of its probable risk of malignant transformation and recurrence; therefore follow-up is warranted.

Competing interests: Dr. Aslzare, Dr. Jafarian and Dr. Ghoreifi all declare no competing financial or personal interests.

This paper has been peer-reviewed.

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