Case 16702

Leiomyoma: a rare and under-reported urinary bladder tumour
Published on 15.04.2020

DOI: 10.35100/eurorad/case.16702
ISSN: 1563-4086
Section: Uroradiology & genital male imaging
Area of Interest: Urinary Tract / Bladder Special Focus:
Neoplasia Case Type: Clinical Cases
Authors: Gasim Ahmed1, Hamza Imran1, Amany Said2, Santhi Kumar2, Saeed Usman1
Patient: 47, 61, and 73 years; male

Clinical History:

Three Caucasian adults (aged 47, 61 and 73 years) with an unremarkable medical background presented with frank painless haematuria and lower abdominal pain. Clinical examination was unremarkable, and haematuria without proteinuria was seen on the urine dipstick of all three patients.

Imaging Findings:

The first and second patient were evaluated initially with ultrasonography, which showed a well-defined hypoechoic lesion in the anterior wall of the urinary bladder (Fig. 1). The third patient, given his significant smoking history, had a contrast-enhanced computed tomography of the urinary system, which revealed a non-enhancing soft tissue density in the anteroinferior wall of the urinary bladder (Fig. 4, 5). All three patients had MRI imaging, which revealed a well-defined T1 and T2 low-intermediate signal intensity, intravesical mass. The lesion was not associated with extravesical extension or pelvic lymphadenopathy (Fig. 3).

Further cystoscopic evaluation revealed smooth intravesical masses covered with an unremarkable urothelium. On histopathologic evaluation, an unencapsulated, well-circumscribed, low cellularity spindle cell lamina propria lesion with benign surface mucosal urothelium was seen. There was no evidence of coagulative tumour necrosis, abnormal mitosis, or atypia (Fig. 6-8).

Discussion:

Leiomyomas have been described in various organs, including the uterus, stomach, seminal vesicles, and even the breast [1-4]. In the bladder, despite being the most common mesenchymal neoplasms, they constitute less than 0.5% of all vesical tumours [5]. Virchow described the first case of urinary bladder leiomyoma in 1892, and, since then, less than 250 cases have been documented in the literature [6-9]. The vast majority of these muscular neoplasms are intravesical (63%), while extravesical and mural tumours represent 30% and 7%, respectively [10, 11]. While the vast majority of extravesical and mural lesions are asymptomatic, the presentation of intravesical neoplasms may include haematuria, urinary frequency, mass effect, or bladder outflow obstruction [10, 12].

Radiologically, these lesions resemble uterine fibroids on ultrasound, CT, and MRI and may appear either as an indentation of the bladder wall or an intraluminal mass. On US, these lesions are typically smooth-walled, homogeneously hypoechoic, solid neoplasms in the bladder with a thin echogenic surface. Furthermore, ultrasound can define the intravesical, intramural, or extravesical location of the lesion [1]. On CT, bladder leiomyomas appear as hypodense lesions with weak to moderate enhancement characteristics [1, 2].
MRI adds a new dimension to the recognition and overall assessment of bladder lesions and helps in differentiating benign leiomyoma from malignant leiomyosarcoma. An intermediate signal intensity characterises the normal bladder wall on T1-weighted images. On T2 weighted sequences, a low internal and intermediate external signal intensity is observed [13]. The mucosa and lamina propria are not clearly depicted in the healthy bladder. Furthermore, T1-weighted images demonstrate bladder wall margins, perivesical structures and tumour margins, whereas T2-weighted fast spin-echo sequences demonstrate invasion of surrounding structures and the presence or absence of lymphadenopathy [14]. Leiomyoma has a low to intermediate signal intensity on T1 and low signal characteristics on T2-weighted sequences. Degenerative leiomyoma appears heterogeneous with high signal intensity on T2 sequences reflecting their cystic components in association with haemorrhage and calcifications if present. Contrast-enhancement is variable and is usually absent in degenerating lesions [10, 15]. It is of high importance to point out that the degree of enhancement is not a reliable sign in differentiating between benign leiomyoma and the more devastating leiomyosarcoma because both or neither may enhance after administration of gadolinium. Here, invasion of the bladder wall and surrounding soft tissue plains is a more reliable sign of malignancy [15].

Written informed patient consent for publication has been obtained.

**Differential Diagnosis List:** Leiomyoma of the urinary bladder, Transitional cell carcinoma: hyperintense on T2W images, Squamous cell carcinoma: more common where Schistosomiasis is prevalent, Adenocarcinoma: bladder wall thickening on CT and T2 hyperintense , Artefactual bladder thickening (blood products/clot): Non-enhancing on postcontrast CT/MRI.

**Final Diagnosis:** Leiomyoma of the urinary bladder

**References:**

9215185)
Description: A sagittal ultrasonic image of the bladder showing a well-defined hypoechogetic soft tissue lesion in the anterior vesical wall. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Axial (2A) and coronal (2B) images of an MRI T1 sequence showing a well-defined 23 mm low signal intensity lesion originating from the left bladder dome. No intraluminal extension or lymphadenopathy was present. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Axial (2A) and coronal (2B) images of an MRI T1 sequence showing a well-defined 23 mm low signal intensity lesion originating from the left bladder dome. No intraluminal extension or lymphadenopathy was present. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
**Description:** Axial (3A), coronal (3B), and sagittal (3C) MRI T2 sequence images showing a well-defined 28 mm low to intermediate signal intensity lesion originating from the left bladder dome. No intraluminal extension or lymphadenopathy was present. **Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020.
Description: Axial (3A), coronal (3B), and sagittal (3C) MRI T2 sequence images showing a well-defined 28 mm low to intermediate signal intensity lesion originating from the left bladder dome. No intraluminal extension or lymphadenopathy was present. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Axial (3A), coronal (3B), and sagittal (3C) MRI T2 sequence images showing a well-defined 28 mm low to intermediate signal intensity lesion originating from the left bladder dome. No intraluminal extension or lymphadenopathy was present. **Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Figure 4

Description: Axial (4A), coronal (4B), and sagittal (4C) non-contrast enhanced computed tomography images showing a well-defined soft tissue density in the anteroinferior bladder wall. No lymphadenopathy was present. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
**Description:** Axial (4A), coronal (4B), and sagittal (4C) non-contrast enhanced computed tomography images showing a well-defined soft tissue density in the anteroinferior bladder wall. No lymphadenopathy was present. **Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Axial (4A), coronal (4B), and sagittal (4C) non-contrast enhanced computed tomography images showing a well-defined soft tissue density in the anteroinferior bladder wall. No lymphadenopathy was present. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Figure 5

**Description:** Axial (5A), coronal (5B), and sagittal (5C) contrast-enhanced computed tomography images showing a well-defined poorly enhancing soft tissue density in the anteroinferior bladder wall.

**Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
**Description:** Axial (5A), coronal (5B), and sagittal (5C) contrast-enhanced computed tomography images showing a well-defined poorly enhancing soft tissue density in the anteroinferior bladder wall.

**Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Axial (5A), coronal (5B), and sagittal (5C) contrast-enhanced computed tomography images showing a well-defined poorly enhancing soft tissue density in the anteroinferior bladder wall.
Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
**Description:** Histologic examination showing an unencapsulated, well-circumscribed, low cellularity spindle cell lesion in the lamina propria with benign surface mucosal urothelium. The lesional cells are bland spindle cells with eosinophilic cytoplasm. There is no evidence of coagulative tumour necrosis, abnormal mitosis, or atypia. (A: Haemotoxylin and Eosin x4 magnification, B: Haemotoxylin and Eosin x10 magnification). **Origin:** Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Leiomyoma of the urinary bladder: Higher magnification (Haemotoxylin and Eosin x20) showing spindle cells arranged in interlacing bundles. The cells have indistinct cell borders. Note the cigar-shaped nuclei and the bland nuclear appearance. Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020
Description: Leiomyoma of the urinary bladder: The lesional cells are strongly and diffusely positive for smooth muscle desmin (A) and smooth muscle actin (B). Origin: Radiology and Histopathology departments of Royal Blackburn Hospital, Blackburn, UK, 2020