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BLADDER LEIOMYOMA WITH URETERIC INVOLVEMENT: CASE REPORT WITH LITERATURE REVIEW

Urology

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ABSTRACT

Introduction Bladder leiomyomas are rare and benign tumors of bladder which account for 0.5% of all urinary bladder tumors especially those at vesicoureteric junction which are still rarer. Only low numbers of cases were reported till date with estimated at approximately 300 cases worldwide. Based on size and localization of the lesion, their symptoms vary considerably. Women seem to be more affected, and obstructive symptoms predominate. **Objective:** Purpose of our presentation is to stimulate surgeons dealing with bladder tumors to keep leiomyoma as differential diagnosis and a lesser aggressive approach inspite of Ureteric orifice involvement. **Case presentation** We present a clinical case of an 82-year old woman admitted under General surgery for Umbilical hernia repair with Incidental finding of Bladder mass on Ultrasound. CT showed a well-defined non- enhancing bladder mass in right posterolateral wall involving Right Ureteric orifice with no upstream dilatation and cystoscopy established the findings. Patient underwent successful transurethral resection of the lesion and Histopathology confirmed the diagnosis. **Conclusions** Urinary bladder leiomyoma can present as bladder mass with varying degrees of presentation from asymptomatic to obstructive symptoms. Transurethral resection is almost highly effective even in cases with tumors involving ureteric orifice without the need for aggressive surgical approach.

KEYWORDS

Bladder; Leiomyoma

INTRODUCTION

Leiomyoma represents a benign growth of smooth muscle tissue. These can occur anywhere in the body where smooth muscle is found, but frequently located in the uterus (fibroids) or gastrointestinal tract. The occurrence of leiomyoma in the bladder is quite a rare phenomenon, although it is the most common benign mesenchymal neoplasm of this organ, estimated at about less than 0.5% of all bladder tumors and one-third of all mesenchymal tumors [1,2]. Although it may be asymptomatic in about 20% of the cases, the majority presents with obstructive voiding symptoms or irritative urinary symptoms [3,4]. Surgery is the standard treatment, and the surgical approach depends on tumor size and location at the bladder wall. Easily accessible tumors can be treated with transurethral resection of the bladder tumor, while a large tumor may require segmental resection or laparoscopic partial cystectomy.

Here we present a clinical case of an 82-year old woman admitted under General surgery for Umbilical hernia repair with Incidental finding of Bladder mass on Ultrasound.

Case presentation

An 82-year-old woman referred to urology department with incidental finding of bladder mass with right vuj involvement on Ultrasound with no urinary symptoms or any history of lower urinary tract symptoms while being evaluated for Umbilical hernia. During the initial evaluation, no abnormalities were found on physical examination or in routine laboratory studies. Serum Creatinine was 1.1 mg/dl. Urinalysis was normal with 2-3 pus cells. Urine cytology was negative for malignancy. Ultrasound of the lower urinary tract revealed a smooth endovesical bladder lesion in the Right posterolateral wall involving Right vuj with no upstream hydroureteronephrosis.

Cect was done and it confirmed the presence of a solid, well-delineated non enhancing mass measuring 42× 30 × 30 mm that appeared to arise from the posterior wall (Fig. 1, 2). There was no upstream obstruction inspite of involvement of right vuj which was not seen separately from the lesion.

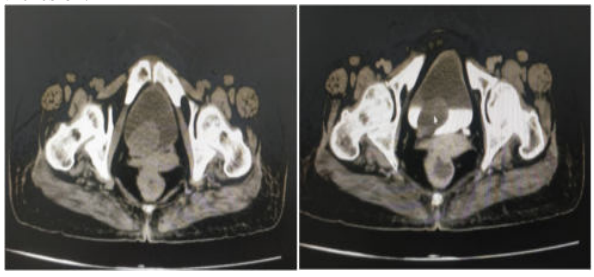

Fig. 1 CT confirmed the presence of a solid, well-delineated mass measuring 42 × 30 ×30 mm that appeared to arise from the bladder posterior wall

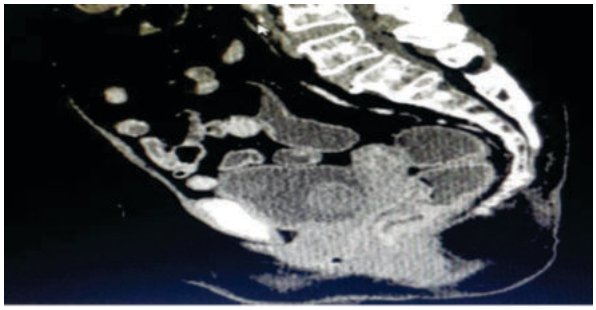

Fig. 2

The patient underwent cystoscopy, which revealed a protruding mass of size 4×3 cm in bladder posterior wall over right vuj with normal covering urothelium. There was a distortion in the area of the right ureteric orifice, which was displaced by the mass posterior to its normal position (Fig. 3).

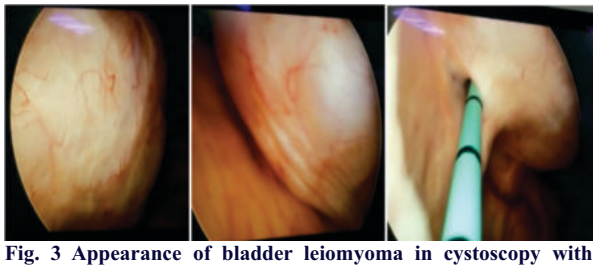

Fig. 3 Appearance of bladder leiomyoma in cystoscopy with ureteric catheter in situ in right Ureter

The patient underwent an uneventful TURBT. Special care was taken to prevent injury to right ureteric orifice. Left ureteric orifice was seen to be intact. Right ureteral stenting was done after complete resection. The catheter was removed on second postoperative day and patient discharged on same day.

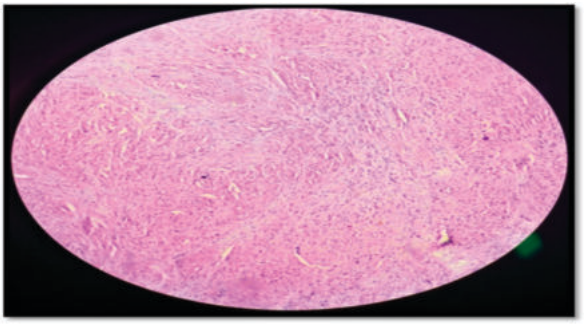

Fig. 4 Histopathology of Leiomyoma bladder in our case showing that it is composed of whorled interlacing fascicles of spindle-shaped cells (Department of Pathology, KIMS, Hubli)

Histopathology proved that the lesion was a benign submucosal leiomyoma and consisted of interlacing fascicles of spindle-shape cells. The cells had no pleomorphism and contained bland-looking central spindle nuclei and eosinophilic cytoplasm. Microscopic examination of the resected tissue fragments did not reveal any mitotic activity or coagulative necrosis.

Six weeks post procedure, patient was posted for cystoscopy and stent removal which did not show any scarring of ureteric orifice and ultrasound revealed normal kidneys. **No recurrence after six months of follow up.**

DISCUSSION AND CONCLUSIONS:

Although they are rare, leiomyoma of urinary bladder are most common benign mesenchymal tumor of the bladder, with an incidence rate less than 0.5% among all types of bladder tumors [1, 2]. It was first described by Kretschmer et al. in 1931 [5]. We reviewed recent relevant literature for bladder leiomyoma with ureteric involvement as tabulated in Table 1 with all cases involving Vesicoureteric junction (vuj). Isolated ureteric leiomyoma was reported in a report by McNall et al [6] which was managed conservatively. As there are no standard guidelines for this entity although TURBT and Partial Cystectomy have been advocated and performed routinely now for these cases.

Table 1. Recent literature review with Bladder leiomyoma involving ureter

Sr No.	Study	Leiomyoma cases with ureteric involvement	Tumor location	Symptoms/ HDUN	Tumor size (cm)	Treatment	Follow up/ Recurrence
1	Park JW et al 2010	1	Left Vuj	LUTS	3.2 cm	TURBT	14 months/ No
2	Khater N et al 2013	1	Left Vuj	Hematuria with dysuria	6×4.2cm	TURBT	NA
3	Dodia et al 2017 [7]	1	Right Vuj	Hematuria	4×3 cm	Open Enucleation	NA
4	Sharma et al 2018 [8]	1	Left Vuj	LUTS	3.8	TURBT	NA
5	Mitchell et al, 2019 [9]	1	Left Vuj	Hematuria	6	Refractory TURBT x 4 Radical cystoprostatectomy	16 months/ Yes
6	Tobias Machado et al 2020 [10]	1	Posterolateral wall	LUTS	3 cm	Robot assisted Partial cystectomy	NA
7	Zachariou et al 2020 [11]	1	Left Vuj	Hematuria with Luts	4.1×2.4 cm	TURBT	12 months/ No
8	Delara et al 2021 [12]	1	Left Vuj	Urgency	2×1.7 cm	TURBT	NA
9	N AlAmri et al 2022 [13]	1	Left Vuj	Dysuria	1.5×1.1 cm	TURBT	3 months/ No
10	M. Przudzik et al 2022 [14]	1	Left vuj	Asymptomatic	1.5 cm	TURBT(Enbloc)	50 months/ No
11	McNall S et al 2022 [6]	2	Right vuj and Left distal ureter	Lower abdominal pain	2.4 cm & 1.5 cm	TURBT & Conservative	36 months/ No
12	K Omkaram et al 2023 [15]	1	Left Vuj	Hematuria	6×5 cm	TURBT followed by Open Excision	24 months/No

Pathophysiology:

The pathophysiology of these lesions remains unclear but four theories [16] have been proposed: (1) Lips-Chutz's theory: Hormonal disturbances cause these tumors to develop with estrogen and progesterone having a primary role; (2) Piegel's disontogenic theory: embryonic rests of tissue residing in the bladder that transform into leiomyomas; (3) Perivascular inflammation leading to metaplastic transformation of the bladder vascular supply; and (4) Blum's irritative theory: Bladder musculature infection leading to inflammation and the development of these benign tumors. Still studies are needed to elucidate exact mechanism of these benign tumors.

Incidence & Classification:

Initially it was thought that bladder leiomyoma occur equally in both sexes and are evenly distributed across all age groups [1]. However, recent studies have reported a female preponderance (70%) [1,2], and this pathology affects more in their third to sixth decades. Leiomyomas are classified according to different locations in bladder, i.e., endovesical, intramural, and extravesical. Endovesical (63-86%) is the most common location, while intramural in 3–5% and extravesical in 10–30% [1,4].

Clinical Presentation:

Patients with bladder leiomyomas can be asymptomatic (20%), but most of them present with obstructive symptoms (49%), irritative symptoms (38%) and hematuria (11%) [1]. Lesions involving ureter and Vesicoureteric junction have more of irritative symptoms and pain in lower abdomen in few cases. Larger lesions are more symptomatic comparatively. A leiomyoma located in the bladder trigone may cause more severe obstructive symptoms compared with a lesion located in the bladder wall [17].

Table 2. Clinical Features in Bladder leiomyoma

Clinical presentation	No of patients (%)
Asymptomatic	20 %
Obstructive symptoms	39 %
Irritative symptoms	29 %
Hematuria	11%
Lower Abdominal pain	1%

Investigations:

Classical investigations for bladder leiomyoma include Ultrasound, CT and MRI. Ultrasound being the first investigation to detect these

tumors as was in our case and findings suggest homogenous, smooth walled lesions with numerous internal echoes. CECT is used to determine size and extent of the tumor. Solid tumors of the bladder wall, with densities of around 25-50 HU are the typical CT findings in bladder leiomyomas [1]. MRI imaging is better than CT for evaluating the origin and the boundary demarcation of the tumor. Leiomyomas on MRI have a medium-signal intensity on T1-WI and homogenous low signal intensity on T1-WI, with a smooth peripheral mimicking a uterine leiomyoma [18]. In all the above mentioned investigations, imaging techniques can never exclude a malignancy; thus only histological studies can prove an accurate diagnosis of leiomyoma.

Histopathology:

Leiomyomas are clear-margined, capsulated solid masses with yellow-colored internal sectional surface. Leiomyoma consists of intersecting smooth muscle fascicles surrounding vascular structures lined with normal endothelium and arranged as bundles extending in various directions. No mitotic activity, hemorrhage or necrosis foci are seen in these lesions. On Immunohistochemistry, they have positive staining with smooth muscle actin (SMA) and muscle-specific actin (MSA). They stain negative with keratins and epithelial membrane antigens (EMA). Detrusor muscle invasion is the deciding factor in differential diagnosis with leiomyosarcoma [19].

Treatment options:

Management of leiomyomas varies by the size of lesion, anatomical location, and relationship with bladder wall [1,2,4]. Surgery is indicated due to the potential growth capacity of these tumors. The procedure must be as conservative as possible given the benign nature of these lesions. Treatment options include transurethral resection and Open/ Laparoscopic/ Robotic surgical excision (enucleation or/with partial cystectomy). Transurethral resection is the treatment of choice for tumors even with Vesicoureteric junction involvement. Ureteral stenting is indicated given the close proximity of tumor to distal ureter and vuj but rarely requires any ureteric procedures like re-implantation.

In our case, the patient was asymptomatic. Therefore, transurethral resection was suitable along with right ureteric stenting and complete resection could be achieved. There was no scarring at ureteric orifice during cystoscopic follow up at 6 weeks and no recurrence after 6 months follow-up.

Recurrence after surgical removal is rare, and recurrent cases have been successfully managed with repeat transurethral resection or enucleation. Having in mind that there are no clear guidelines regarding follow-up of these cases, the clear suggestion is to avoid exposing the patients to invasive or radiologic investigations to detect small asymptomatic recurrences.

This report and review demonstrates that transurethral resection of a bladder leiomyoma with ureteric involvement is a feasible and effective procedure. Follow-up proved no damage to ureteral orifice and equivocal results as that for enucleation or open excision procedures.

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