# *Bladder leiomyoma: report of two cases and literature review*

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*Mesenchymal tumors of the urinary bladder are rare and the majority of them are malignant. We report two cases of leiomyoma of the urinary bladder presenting with symptoms of bladder outlet obstruction. The first patient was managed with staged transurethral resections, and the second with holmium laser transurethral inoculation. The outcome was excellent in both cases. A review of the literature is also outlined.*

**Key Words:** leiomyoma, urinary bladder, bladder tumor

## Introduction

Benign mesenchymal tumors of the urinary bladder are rare. Leiomyoma is the most common mesenchymal tumor of the bladder accounting for approximately 35% of them, and accounts for less than 0.43% of all bladder tumors. Approximately 250 cases have been reported to date, including patients who had leiomyoma in a urethral location.[1] Although most reports within the last decade describe tumors found incidentally on ultrasonography, there have been some exceptional cases of symptomatic leiomyomas reaching dimensions of 3500 gm[2] Symptoms as well as treatment depend on the location and size of the lesion. We report two such cases with a review of the literature.

## Case report:

### *Case one*

A 33 year old man otherwise healthy was referred urgently for urological assessment secondary to a recently diagnosed bladder mass (7.5 cm X 5.3 cm) on abdominal ultrasonography appearing as a continuation of the central portion of the prostate.

The patient reported a history of hesitancy, dribbling, and weak urinary stream. There was no history of gross hematuria, weight loss, or other urological or constitutional symptoms. Physical examination was completely normal, including a normal rectal examination. All laboratory investigations were normal including a normal urinalysis, urine cytology, and a PSA of 0.43 ng/ml. A cystourethroscopy revealed a large solid bladder tumor extending from the bladder neck to the right postero-lateral wall causing an intermittent bladder outlet obstruction.

A biopsy of this mass showed chronic inflammation with Von Brunn's nests and no evidence of malignancy. A transrectal ultrasound revealed a bladder mass distinct and separate from the prostate. An abdominal and pelvic CT scan confirmed this enhancing bladder mass (6.5 cm X 5.5 cm) with normal upper urinary tracts. This patient underwent a transurethral resection of this mass (TURBT), with only a small portion resected. The final pathology for it was a benign bladder leiomyoma. Subsequently, a two-staged TURBT was performed with over 140 grams of tissues resected. During resection, care was taken to preserve the bladder neck. Post-operatively, during the short-term follow-up, the patient did well with no reported complications. A repeat abdominal and pelvic CAT scan post-operatively confirmed the complete resection of the whole mass.

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*Case two*

A 62 year old woman with multiple medical problems requiring life long anticoagulation with warfarin (atrial fibrillation, mitral valve regurgitation, hypercoagulable status resulting in left eye blindness after thromboembolic event, and multiple deep vein thrombosis) was followed up for long time for interstitial cystitis, presented recently with increasing frequency, decrease urinary stream, and hesitancy. Her uroflowmetry was equivocal with a maximum flow rate of 16 cc/second and post void residual of 90 cc; urine cytology and culture were normal. An abdominal ultrasound scan revealed a well-defined homogenous mass arising from the left superior portion of the urinary bladder measuring 3.3 cm X 3.5 cm Figure1. Cystourethroscopy revealed an exophytic well demarcated bladder tumor near the bladder dome. Based on the tumor appearance and the patient medical limitations namely anticoagulation therapy, we decided to proceed with a one stage transurethral Holmium –Laser transurethral inoculation of the tumor, with deeper biopsies taken after with the resectoscope. The procedure was accomplished with no complications and the final pathology was of a benign smooth muscles compatible with leiomyoma. During the subsequent one-year follow up, the patient reported no complaints, post operative ultrasound scanning Figure 2 and cystourethroscopy were unremarkable with no evidence of recurrence.

## Discussion

Benign mesenchymal tumors of the urinary bladder are rare and account for 1% - 5 % of all bladder tumors. Leiomyomas are the most common of these tumors, comprising one third of this group.[4] It carries a female

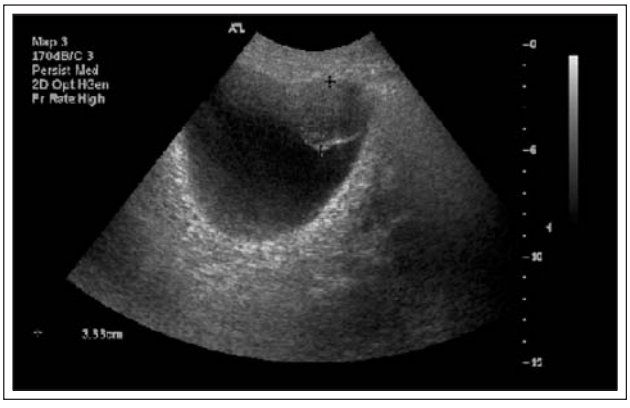


**Figure 1.** Case two. Preoperative ultrasound showing the bladder mass.

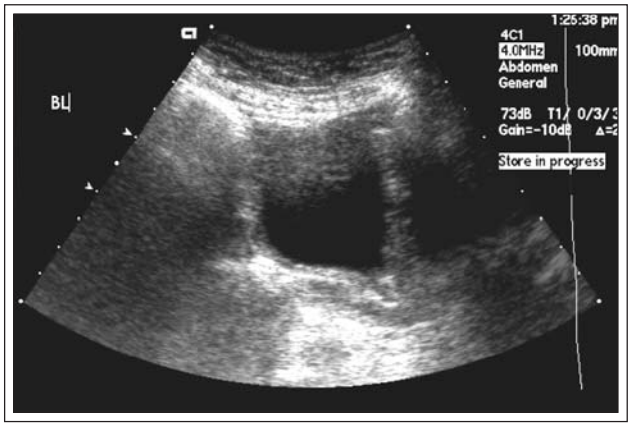


**Figure 2.** Case two. One year Postoperative ultrasound showing no recurrence.

predominance, with a female to male ratio of 3:1. They are usually asymptomatic but can cause irritative or obstructive bladder symptoms especially with increasing sizes and location, with or without hematuria. Bladder leiomyomas can be intramural (7%) extravesical (30%) or most commonly endovesical (63%).[3] In February 1994, Goluboff et al[4] reviewed all reported cases of leiomyoma of the bladder in the English literature since 1970. They indicated that obstructive symptoms were the most frequent presenting patient complaint (49%), with the remaining patients, 38% presented with irritative voiding symptoms, 11% with hematuria and 19% were asymptomatic.

Knoll et al[5] indicated that irritative symptoms were the most frequent presenting symptom.

Fernandez and Dehesa[6] investigated the various radiographic measures used in demonstrating these benign tumors to determine which method was the most fruitful for the physician preoperatively. They noted computed tomography scan to be beneficial for precisely locating the tumor but inadequate for identifying its relationship to the adjacent bladder mucosa or vaginal wall due to its fixed axial plane and advocated transvaginal ultrasound, which they perceived as producing better definition of the mass.

Leiomyomas of the bladder are demonstrated sonographically as solid smooth-walled lesions with many internal echoes and with an underlying homogeneous texture of medium echogenicity .[4]

In a report by Sundaram et al[7] characteristics of bladder leiomyomas as noted on magnetic resonance imaging (MRI) have been described. They found that MRI of the bladder can differentiate mesenchymal tumors from the more common transitional cell tumors. $T_2$-weighted fast spin echo and post

gadolinium images are both helpful in the evaluation of bladder tumors with normal bladder wall appearing as a band of intermediate signal intensity on $T_1$-weighted images and as bands of low (inner) and intermediate (outer) signal intensity on $T_2$-weighted images. The mucosa and lamina propria are not clearly seen in the normal bladder. $T_1$-weighted images demonstrate bladder wall margins, perivesical structures, and tumor margins. $T_2$-weighted fast spin echo images also clearly depict invasion of surrounding structures and any lymphadenopathy, if present. Invasion of tumor into muscle is also visualized on $T_2$-weighted images.

Cystoscopically, these tumors are easily visualized and are covered with normal bladder mucosa.

Histologically, leiomyomas of the bladder may be clearly differentiated from leiomyosarcoma. Leiomyomas appear as whitish-gray round to ovoid nodules with spiral appearance of smooth muscle fibers. They are firm and rubbery in consistency. There are usually less than two mitotic figures per high power field.[4] Like its benign counterpart, leiomyosarcoma may have little mitotic activity microscopically but it usually has a large quantity of myxoid intracellular material and invades the muscularis propria. There are no reports of malignant degeneration of leiomyoma. The pathophysiology of leiomyoma of the bladder is unclear. There are four major theories that have been proposed: (a) Inflammatory reaction of the bladder wall to an infection of the bladder musculature; (b) Metaplastic reaction around the perivascular walls from vascular inflammation of the bladder; (c) Neoplasia controlled by hormonal influences; or (d) Dysontogenesis—the result of embryologic rest within the bladder wall developing into a smooth muscle tumor.[4]

The treatment of these rare mesothelial bladder tumors is determined primarily by their size and anatomic location. In Goluboff's review of the literature, 62% were treated by open resection, whereas 30% were removed by transurethral resection. The small endovesical tumors can be resected transurethrally; only 18% have necessitated reoperation due to incomplete initial resection. Of the 62% of patients who underwent open resection, all had large endovesical tumors, extravesical tumors, or intramural lesions, and none required a second procedure.[4]

In our first case we managed to achieve complete resection of the large bladder leiomyoma by staged TURBTs, with no subsequent complications encountered. Holmium-Laser resection/inoculation of bladder tumors has been proven to be a safe and effective treatment modality.[9] The Laser technique does not alter the stage or the diagnosis of bladder tumors, and can be used as a viable alternative to the standard electrocautery transurethral resections especially for high risk patients like the second case in this report. Laparoscopic approach for large transmural, and extravesical bladder leiomyomas has been reported with good result.[8]

Because all reported bladder leiomyomas have followed a benign course and there are no reports of malignant transformation, Cornella et al[1] have recommended that if imaging, cystoscopic evaluation and biopsy indicate a high probability of leiomyoma, then the patient who is asymptomatic can be followed up. Prognosis is excellent, and malignant transformation has not been reported.

## Conclusion

Transurethral resection of bladder leiomyoma is feasible in the majority of cases, with very little morbidity, and no reported malignant transformation.

For large lesions, a staged TURBT can be applied, and for high risk patients and large tumors Holmium-Laser inoculation/resections can be used. Both carry the advantage of faster recovery and lower morbidity compared to open surgery. □

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