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Case Series

Benign Bladder Masses: Clinicopathological Spectrum, Diagnostic Evaluation, and Management — A Series of 15 Cases

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ABSTRACT

Background: Benign bladder masses are uncommon and account for less than 5% of bladder neoplasms [1,2]. They comprise a heterogeneous group of mesenchymal and non-mesenchymal lesions. Smooth muscle tumors represent the most frequently reported benign mesenchymal subtype in published series [4,5]. Because clinical and radiological findings may overlap with malignant tumors, accurate diagnosis and appropriate management are essential [2,8].
Objective: To evaluate the clinicopathological characteristics, radiological features, management strategies, and outcomes of 15 patients diagnosed with benign bladder masses, with emphasis on individualized treatment according to tumor location and symptomatology.
Methods: A retrospective observational study was conducted including 15 consecutive patients with histologically confirmed benign bladder masses.
Results: Smooth muscle tumors accounted for 73.3% of cases, consistent with prior reports [4,5]. Intravesical lesions were predominantly symptomatic and managed surgically, whereas intramural lesions were largely incidental and managed conservatively [10]. One biopsy-proven extravesical smooth muscle tumor was managed conservatively without progression.
Conclusion: Benign bladder masses demonstrate excellent prognosis. Conservative management is appropriate for selected asymptomatic intramural and biopsy-proven extravesical lesions [10,16], whereas symptomatic intravesical tumors warrant surgical excision [12,14].

Keywords*: Clinicopathological, Diagnostic, bladder neoplasms, clinicopathological.*

INTRODUCTION

Benign tumors of the urinary bladder represent less than 5% of all bladder neoplasms [1,2]. Although rare, they are clinically important because radiologic and cystoscopic findings frequently overlap with those of urothelial carcinoma [2,8].

The pathological spectrum includes mesenchymal tumors such as smooth muscle tumors, hemangiomas, neurofibromas, and inflammatory pseudotumors [3]. Among these, smooth muscle tumors are the most frequently reported benign mesenchymal subtype [4–6].

These tumors arise from the detrusor muscle and are typically well-circumscribed, slow-growing, and non-invasive [4,6]. Histologically, they demonstrate bland spindle cells arranged in interlacing bundles with minimal mitotic activity and absence of necrosis, consistent with WHO criteria for benign smooth muscle tumors [18].

Benign bladder masses are categorized into intravesical, intramural, and extravesical types. Clinical presentation correlates primarily with anatomical location rather than histological subtype [5,12].

MATERIALS AND METHODS

Study Design

Retrospective descriptive study of 15 consecutive patients diagnosed with benign bladder masses at a tertiary care center.

Inclusion Criteria

- Histopathological confirmation of benign bladder mass
- Complete imaging documentation
- Minimum follow-up of 12 months

Parameters Evaluated

- Age and sex
- Presenting symptoms
- Imaging findings (ultrasound, CT, MRI)
- Tumor size and anatomical classification
- Management approach
- Histopathological diagnosis
- Follow-up outcome

RESULTS

Demographic Characteristics

Table 1. Demographic Profile

Parameter	Value
Total patients	15
Mean age	42 years (range 28–63)
Female	10 (66.7%)
Male	5 (33.3%)

Female predominance was noted, particularly among smooth muscle tumors, consistent with prior reports suggesting possible hormonal influence [4,7].

Histopathological Distribution

Table 2. Histopathological Spectrum

Diagnosis	Number (n=15)	Percentage
Smooth muscle tumor (leiomyoma)	11	73.3%
Inflammatory pseudotumor	2	13.3%
Hemangioma	1	6.7%
Fibroepithelial polyp	1	6.7%

Smooth muscle tumors represented the majority of cases.

Anatomical Distribution

Table 3. Tumor Location

Location	Number of Cases
Intravesical	7
Intramural	5
Extravesical	3

Among smooth muscle tumors:

- Intravesical: 6
- Intramural: 4
- Extravesical: 1

Clinical Presentation

Table 4. Presenting Symptoms

Symptom	Number
Irritative LUTS	7
Obstructive symptoms	3
Hematuria	2
Incidental finding	3

Intravesical lesions were predominantly symptomatic, while intramural lesions were frequently incidental findings.

Radiological Evaluation
Ultrasound typically demonstrated well-defined hypoechoic lesions with smooth margins. CT scans revealed homogeneous soft tissue density without lymphadenopathy.

MRI was particularly valuable in defining tumor depth and growth pattern. Smooth muscle tumors characteristically appear:

- Isointense to skeletal muscle on T1-weighted images
- Low signal intensity on T2-weighted images
- Homogeneous contrast enhancement

MRI also assists in differentiating intramural from extravesical growth and evaluating adjacent organ involvement [6,8].

Management
Intravesical Lesions (n=7)

- Majority symptomatic
- Treated surgically
    - Transurethral resection for tumors <3 cm
    - Partial cystectomy for larger lesions

Complete excision achieved in all cases.

Intramural Lesions (n=5)

- Mostly asymptomatic
- Tumor size <3 cm
- Imaging features consistent with benign pathology

Managed conservatively with:

- Periodic ultrasound or MRI
- Clinical follow-up every 6–12 months

No progression observed.

Extravesical Lesions (n=3)
Two extravesical lesions underwent surgical excision due to mass effect.

One extravesical smooth muscle tumor:

- Incidentally detected
- Asymptomatic
- MRI showed well-circumscribed lesion without invasion
- CT-guided needle biopsy performed
- Histology confirmed benign smooth muscle proliferation
- Managed conservatively with surveillance

No increase in size or symptoms during 24-month follow-up.

DISCUSSION
Benign bladder masses represent a small but clinically significant subset of bladder tumors. Despite their rarity, they pose diagnostic challenges because imaging characteristics may closely resemble malignant lesions [2,8].

Epidemiology and Pathological Spectrum
Multiple case series confirm that smooth muscle tumors are the most commonly reported benign bladder neoplasms [4–6,12]. Silva-Ramos et al. analyzed 90 cases and demonstrated intravesical predominance with excellent outcomes following excision [5]. Similarly, Goluboff et al. reported favorable prognosis and low recurrence rates in their review [4].

Female predominance has been consistently observed [4,7,17]. Cornella et al. suggested possible hormonal influence based on estrogen receptor expression in some tumors [7]. However, definitive causative relationships remain unclear.

According to the WHO classification, benign smooth muscle tumors are defined by absence of cytologic atypia, low mitotic activity, and lack of tumor necrosis [18]. Accurate histopathological differentiation from leiomyosarcoma is critical, as the latter demonstrates increased mitotic figures, atypia, and infiltrative growth.

Growth Pattern and Clinical Correlation
Published literature suggests distribution as follows: intravesical (60–70%), intramural (20–30%), and extravesical (10–15%) [5,16].

In our study, clinical presentation correlated strongly with anatomical location.

Intravesical lesions commonly produce irritative and obstructive symptoms due to luminal protrusion and mucosal irritation [12,14]. Beaghler et al. emphasized that most symptomatic patients harbor intravesical growth patterns [12].

Intramural lesions are frequently asymptomatic and discovered incidentally [5,16]. Their confinement within the bladder wall explains minimal mucosal irritation.

Extravesical lesions may present as pelvic masses or remain incidental findings [16,17]. Labanaris et al. described similar presentations in their case series [16].

Radiological Assessment
Imaging plays a crucial role in diagnosis.

Ultrasound typically demonstrates well-circumscribed hypoechoic masses [9]. CT imaging reveals homogeneous soft tissue density without lymphadenopathy [8].

MRI is particularly useful for assessing tumor depth and differentiating benign from malignant features [8,9]. Kawashima et al. described typical MRI features including low T2 signal intensity and homogeneous enhancement in benign smooth muscle tumors [8]. Kim et al. further emphasized the value of MRI in distinguishing intramural from extravesical growth patterns [9].

Radiologic features suggestive of benignity include:

- Smooth, well-defined margins
- Homogeneous internal structure
- Absence of invasion
- Lack of lymphadenopathy

Nevertheless, imaging alone cannot definitively exclude malignancy [2].

Role of Biopsy and Conservative Management
Traditionally, surgical excision has been recommended for most bladder masses [14]. However, increasing evidence supports conservative management in selected cases [10,16].

Park et al. reported long-term stability of conservatively managed smooth muscle tumors [10]. Labanaris et al. similarly described successful observation of asymptomatic lesions [16].

In our cohort, asymptomatic intramural lesions were managed conservatively without progression. Additionally, one extravesical smooth muscle tumor was confirmed by CT-guided needle biopsy and managed with surveillance.

Image-guided biopsy is particularly valuable in extravesical lesions when imaging strongly suggests benign pathology [16]. This approach allows histological confirmation while avoiding unnecessary surgery.

Surgical Management
Surgical excision remains the gold standard for symptomatic lesions [12,14].

Transurethral resection is appropriate for small intravesical tumors, while partial cystectomy may be required for larger or broad-based masses [12,14]. Complete excision is typically curative, with recurrence rates reported as extremely low [4,6].

Knoll et al. reported no recurrence following complete resection in their series [6]. Similar outcomes have been documented in multiple reports [4,5].

Prognosis and Follow-Up
Benign bladder masses carry an excellent prognosis. Malignant transformation of histologically confirmed smooth muscle tumors has not been convincingly documented [4,6,18].

Follow-up strategies are not standardized but generally include periodic clinical evaluation and imaging [10]. In our study, mean follow-up of 20 months demonstrated no recurrence or progression.

Study	Year	No. of Cases	Intravesical (%)	Intramural (%)	Extravesical (%)	Management	Recurrence
Knoll et al. [6]	1986	9	67	22	11	Surgical	None
Beaghler et al. [12]	1992	10	70	20	10	TURBT/Partial cystectomy	None
Goluboff et al. [4]	1994	8	62	25	13	Surgical	None
Silva-Ramos et al. [5]	2003	90	63	27	10	Surgical	Rare
Labanaris et al. [16]	2009	12	58	33	9	Surgery/Observation	None
Park et al. [10]	2012	7	43	43	14	Conservative (selected)	None
Present Study	2024	15	47	33	20	Surgery + Selective surveillance	None

Clinical Implications
This study reinforces several key principles:

1. Smooth muscle tumors are the most common benign bladder mass subtype [4–6].
2. Symptomatology correlates strongly with anatomical location [5,12].
3. MRI improves diagnostic confidence and surgical planning [8,9].
4. Conservative management is appropriate in selected intramural and biopsy-proven extravesical lesions [10,16].
5. Surgical excision is curative for symptomatic intravesical tumors [12,14].

Individualized management minimizes overtreatment while maintaining oncological safety.

CONCLUSION

Benign bladder masses are rare entities with favorable prognosis. Smooth muscle tumors represent the most common subtype in clinical practice.

Management should be individualized based on tumor location and symptom burden. Surgical excision is indicated for symptomatic intravesical lesions, whereas selected intramural and biopsy-proven extravesical lesions may be safely managed conservatively with structured follow-up.

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