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Bladder Leiomyoma: A Case Report and Literature Review

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Abstract:

Introduction: Bladder leiomyomas are rare benign mesenchymal neoplasms1-3. Herein we report a case of bladder leiomyoma treated with robotic-assisted laparoscopic enucleation and review the literature on bladder leiomyoma spanning a 5-year period, 2018–2023.

Case presentation: A 54-year-old female incidentally presented with a bladder mass during a regular abdominal ultrasound check-up. A 2.8-cm-sized extraluminal enhancing mass was confirmed using magnetic resonance imaging, and flexible cystoscopy revealed a 4-cm-sized submucosal mass on the posterior wall. Positron emission tomography revealed a bladder wall mass without hypermetabolism. After robotic-assisted laparoscopic enucleation and primary repair, histopathological examination confirmed leiomyoma. A search of the Pubmed, Google Scholar, and Medscape for the 5-year review of the literature (2018–2023) revealed a total of 34 previous cases of bladder leiomyoma (26 articles).

Conclusions: An extraluminal bladder leiomyoma was successfully treated with robotic-assisted laparoscopic enucleation.

Key words: bladder leiomyomas; urinary bladder neoplasms; robotic-assisted laparoscopic enucleation

Introduction

Leiomyoma of the bladder is a benign mesenchymal neoplasm originating from the submucosa and constitutes less than 0.5% of all detected bladder tumors[2,3]. It can occur in both sexes, but is predominantly prevalent in women[4]. To date, more than 250 cases have been reported in English-language journals[2]. The etiology of bladder leiomyomas remains unclear; however, estrogen may be associated with growth thereof[5-7]. Bladder leiomyoma is asymptomatic in approximately 20% of cases, and the remaining patients present with lower urinary tract symptoms (LUTS) including obstructive or irritative symptoms[4]. Imaging methods, including ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and cystoscopy, are used to detect and diagnose this tumor. The primary treatment is surgical resection, including transurethral resection, simple enucleation, and partial cystectomy. Active surveillance, with or without biopsy, is an effective treatment option. The treatment approach depends on the location and size of the tumor. After complete tumor removal, the prognosis is usually favorable, without recurrence. Herein, we present a case of bladder leiomyoma and a review of the related literature.

Case Presentation

A 54-year-old woman was incidentally found to have a 2.27×1.99×2.58 cm^3 bladder mass during a trans-abdominal ultrasound at a local clinic. Located in the posterior wall of the bladder, the mass was homogeneous, hypoechoic, encapsulated by a thin hyperechogenic wall, and without septations. Magnetic resonance imaging (MRI) subsequently confirmed the mass as an ovoid lesion with a smooth margin; the lesion was located in the posterior left bladder wall protruding into the bladder, with low-to-intermediate signal intensity on T1-weighted images (T1WI), and low-to-high signal intensity on T2-weighted images (T2WI) with heterogeneous enhancement; there was no invasion of surrounding structures (Firgure 1).

The patient visited the National Cancer Center without any hematuria, voiding, or dysuria symptoms. During the initial evaluation, no abnormalities were found during the physical examination, routine laboratory studies, or general female genital ultrasonography. The patient underwent cystoscopy, which revealed a 4-cm-sized submucosal mass at the posterior bladder wall covered by normal urothelium (Firgure 2). The contrast CT dynamic urography confirmed the presence of a solid, well-delineated mass measuring 2.7×2.3×2.9 cm^3 in the posterial wall of bladder, with no definite uterine mass or evidence of metastasis in the abdominal cavity (Firgure 3). Positron emission tomography (PET)-CT

revealed a urinary bladder wall mass without measurable hypermetabolism and no other abnormal hypermetabolic lesions, suggesting an ongoing malignant process.

The patient underwent single-port robot-assisted laparoscopic excision and primary repair. Under general anesthesia, the patient underwent lithotomy and the 2-cm-sized mass in the posterior bladder wall was successfully located and resected; frozen sectioning was not performed. The bladder mucosa and wall were subsequently repaired with a 3.0 V-loc suture, and intraoperative cystoscopy confirmed an intact bladder and ureteral orifices. The operating time was 105 min. Postoperatively, the patient remained stable without complications. The Foley catheter was removed on postoperative day (POD)-7, and the patient was discharged on POD-8, with no abnormalities in urination. Cystography confirmed the absence of definite bladder leakage. Histopathology revealed bladder leiomyoma.

Literature Review Of The Past 5 Years (2018–2023)

We gathered the details of 34 cases from 26 articles on bladder leiomyoma from PubMed, Google Scholar, and Medscape[8-33]. The sex distribution of cases was 12:5 (females:males), and the mean age was 41.94 ± 24.12 years (range: 23–67 years). Clinical presentation, tumor location, and treatment methods are listed in Table 1. With regard to the treatment descriptions, two patients initially underwent conservative treatment, but since the tumors increased in size and the patients' symptoms worsened during follow-up, surgery was finally performed. There was one case of small tumor recurrence during postoperative follow-up, however, since the patient was asymptomatic, they underwent conservative management.

Features	Patients (N) (%)
Clinical presentation	
Gross hematuria	6 (17.65%)
Irritative symptoms	15 (44.12%)
Dysuria	6 (17.65%)
Urinary retention	2 (5.88%)
Asymtomatic	13 (38.24%)
Location of tumors	
Endovesical	18 (52.94%)
Intramural	10 (29.41%)
Extravesical	6 (17.65%)
Treatment methods	
Conservative treatment	0
TUR	9 (26.47%)
EBRT	9 (26.47%)
Simple enucleation	8 (23.53%)
Open	3 (8.82%)
Laparoscopic	4 (11.76%)
Robotic-assisted	1 (2.94%)
Partial cystectomy	8 (23.53%)
Open	3 (8.82%)
Laparoscopic	4 (11.76%)
Robotic-assisted	1 (2.94%)
Total	34

TUR: Transurethral resection
EBRT: En bloc transurethral resection of bladder tumor

Discussion

Leiomyoma is a benign smooth muscle neoplasm that can occur in any organ; while the uterus is the most susceptible, and leiomyoma of the the bladder is far rarer. In 1929, De Berne-Lagarde reviewed the literature [34] and found a total of 36 case . Following this, Campbell and Gislason described 68 cases in 1953[35], Goluboff et al. reviewed 37 cases in 1994[4], Silva-Ramos et al. analyzed 90 cases from the literature in 2003[36], Park et al. reported nine cases in 2010[37] and He et al. reviewed 21 cases in 2018[38].

The histopathological characteristics of bladder leiomyoma are similar to those of leiomyoma of the uterus: grey-white round nodules, and the spiral appearance of smooth muscle fibers gathered in small fascicles and separated by varying amounts of fibrous connective tissue[39]. The absence of mitotic activity, cellular atypia, or necrosis has been observed in non-infiltrative smooth muscle tumors. In addition, bladder leiomyoma displays positive staining for smooth muscle actin and negative staining for Ki-67 on immunohistochemistry[1] (Firgure 4) .

Four theories have been proposed to explain the origin of leiomyomas: (1) the tumors arise as a result of a hormonal imbalance, with estrogen and progesterone playing a major role; (2) dysontogenesis, which refers to the development of embryonic remnants of tissue residing in bladder into leiomyomas; (3) bladder musculature infection results in inflammation and the formation of these benign tumors; and (4) perivascular inflammation causes metaplastic transformation of the bladder vascular supply[1].

In our literature review, we found that most authors concluded that there was a strong female preponderance (70%), especially in middle-aged individuals, which is consistent with our case report and collected data. This distribution may be related to the higher frequency of general female genital ultrasound scanning as well as hormone imbalances with estrogen and progesterone.

Patients with bladder leiomyomas may be asymptomatic or symptomatic, presenting with obstructive urinary symptoms, irritative urinary symptoms, or hematuria. Goluboff et al. reported 37 patients with bladder leiomyoma, in which 38% of patients presented with irritative voiding symptoms, including burning dysuria, sensation, and urgency; 49% of patients presented with obstructive voiding symptoms, including acute urinary retention, a weak stream, and a sensation of incomplete emptying; 11% of patients presented with gross hematuria; 13% of patients had flank pain due to ureteric obstruction; and 19% of patients had no symptoms[4]. Silva-Ramos et al. reported that in 90 cases, 26,7% of patients were

asymptomatic[36]. In our collection of 34 cases in the most recent five years, including the present report, asymptomatic patients represented nearly 40% of all cases. This may be due to the frequent use of imaging methods such as ultrasound or CT scans; increasingly, bladder leiomyomas have been incidentally detected without chief complaints.

Bladder leiomyomas are classified into three subtypes, namely: extravesical, intramural, endovesical. The most common type was endovesical, representing 52.94% of cases in our collected series, and in 86% and 51.1% of cases reported by Goluboff et al.[4] and Silva-Ramos M et al.[36], respectively. The intramural subtype represented 29.41%, 3%, and 30% of cases in our series, in Goluboff et al.'s[4] series, and in Silva- Ramos et al.'s[36] series, respectively. The extravesical subtypes constituted 17.65%, 11%, and 16.7% of cases, respectively.

The clinical presentation and chief complaint of bladder leiomyomas may be related to the location and size of the mass within the bladder. The endovesical form can cause more irritative symptoms or hematuria than the intramural or extravesical subtypes. Large tumors located in the trigone or bladder neck may cause irritative and obstructive symptoms, whereas small tumors on the lateral wall or dome tend to be asymptomatic.

Imaging methods, including ultrasonography, CT, and MRI, are essential for the detection of bladder leiomyomas. Ultrasound appears to be the initial imaging method used in the screening of tumors or general health checks. Ultrasonography is a very sensitive and cost-effective method for distinguishing a homogenous submucosal solid mass from peripheral hyperechogenicity[1]. CT can be used to identify the tumor size and location; solid tumors of the bladder wall with densities of approximately 30 Hounsfield Units are typical CT findings of bladder leiomyomas. MRI has a higher specificity for mesenchymal tumors and can mark the relationship between the bladder wall and the detrusor muscle. Typical MRI findings in leiomyomas of the bladder are medium-signal intensity on T1WI, homogenous low signal intensity on T2WI, and a smooth periphery, similar to that of a leiomyoma of the uterus[40,41]. Cystoscopy reveals a smooth submucosal mass covered by normal urothelium. Although typical findings of bladder leiomyomas were obtained using imaging methods in our case, malignancy was not excluded until histopathological and immunohistochemical examinations were performed. As this was the first presentation of this type of tumor in our clinic, we attempted to rule out sarcoma of the vaginal wall using PET-CT.

Surgical tumor resection can be curative, especially when recurrence rates are low. In addition, active surveillance, with or without biopsy, can be performed in cases of small, asymptomatic tumors, as there is no evidence to support the malignant transformation thereof. However, the potential for malignancy should be considered before the exclusion thereof by active surveillance and imaging. Therefore, the gold standard for the definitive diagnosis of bladder leiomyoma is pathological examination after surgical removal of the mass. In the case of uterine myomas, which have pathological characteristics in common with bladder myomas, more than 70% of the patients are asymptomatic and therefore undergo active surveillance[42]. The choice of an appropriate surgical method depends on the size, subtype, and anatomical location of the tumor, and may include transurethral resection (TUR), enucleation, or partial cystectomy (open, laparoscopy, or robot-assisted laparoscopy). TUR can be chosen in cases of small and endovesical tumor subtypes. Excision or partial cystectomy should be considered for large intramural or extravesical tumors. In an analysis of 90 cases of leiomyoma, Silva-Ramos et al. reported that laparoscopy was performed in 56 patients (62.2%), with enucleation in 29 (32.2%), partial cystectomy in 25 (27.8%), and cystectomy in two (2.2%). Their study also revealed that TUR was performed in 27 patients (30%) and transvaginal resection in five (5.6%), while two patients received conservative treatment[36].

In our collected series, more than 50% of patients underwent TUR, which tended to be associated with endovesical subtypes in 52.94% of the cases. Li et al. reported that six patients with bladder leiomyoma underwent en bloc transurethral resection of the bladder tumor[22]. Among these six patients, five had tumors measuring > 2 cm and three had intramural subtypes. This technique is a less invasive approach that is safe, reliable, and effective for selected patients with well-encapsulated tumors (Figure 5).

Robot-assisted laparoscopic excision of a tumor or partial cystectomy has been successfully used for the treatment of large bladder leiomyoma tumors. We performed single-port robot-assisted surgery and achieved a good outcome without complications. We decided to perform robot-assisted laparoscopic excision of the tumor for two main reasons: its posterior location and intramural subtype. When considering the risk of bladder perforation, we believe that robot-assisted enucleation is safer than TUR for the intramural subtype.

The prognosis of bladder leiomyomas treated with excision surgery is usually excellent, and recurrence is rare. In our series, only one case was found to recur as a small tumor, and since the patient had no complaints and was asymptomatic, they were subsequently managed conservatively.

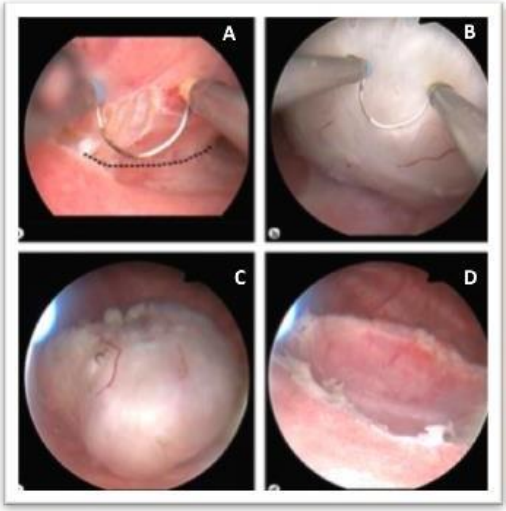

Figure 5. En-bloc transurethral resection of bladder tumor.
Imaging record of the surgical procedure of Axiang Li *et al.*
A. Firstly making an incision along the margin of the bladder (dotted line).
B. Dissecting the tumor from the base by using the resecting loop to give a push.
C. The whole mass with capsule was resected.
D. Exposing the tumor bed after enucleation of the tumor.

(Source: Li A, Zhang P, Zhang M, et al. Transurethral enucleation of bladder leiomyoma: A series of six cases and review of the literature. Urologia Internationalis. 2019;102(1):102-108[22])

Conclusion

Bladder leiomyoma is a rare benign tumor that can lead to lower urinary tract symptoms or, in cases of incidental detection, is asymptomatic. It has special diagnostic characteristics on commonly used imaging modalities (sonography, CT, and MRI); however, pathological confirmation is crucial. Urologists should always perform a full evaluation of the size, location, subtype (endovesical, intramural, or extravesical), or invasion to another organ. Endovesical bladder leiomyomas are the most common subtype; therefore, TUR is the principal therapy for patients with small endovesical bladder leiomyomas. In cases of large extravesical or intramural tumors, urologists should consider performing enucleation or partial cystectomy. In addition, tumor excision is an effective method with good outcomes and pathological confirmation.

References

1. Khater, N., & Sakr, G. (2013). Bladder leiomyoma: Presentation, evaluation and treatment [Presentation]. Arab Journal of Urology, 11(1), 54–61. https://doi.org/10.1016/j.aju.2012.11.007
2. Saunders, S. E., Conjeski, J. M., Zaslau, S., Williams, J., & Kandzari, S. J. (2009). Leiomyoma of the urinary bladder presenting as urinary retention in the female. Canadian Journal of Urology, 16(4), 4762–4764.
3. Cornella, J. L., Larson, T. R., Lee, R. A., Magrina, J. F., & Kammerer-Doak, D. (1997). Leiomyoma of the female urethra and bladder: Report of twenty-three patients and review of the literature. American Journal of Obstetrics and Gynecology, 176(6), 1278–1285. https://doi.org/10.1016/s0002-9378(97)70346-6
4. Goluboff, E. T., O'Toole, K., & Sawczuk, I. S. (1994). Leiomyoma of bladder: Report of case and review of literature. Urology, 43(2), 238–241. https://doi.org/10.1016/0090-4295(94)90053-1
5. Larsson, G. (1994). Multiple leiomyomata of the urinary bladder in a hysterectomized woman. Acta Obstetricia et Gynecologica Scandinavica, 73(1), 78–80. https://doi.org/10.3109/00016349409013402
6. Neto, A. G., Gupta, D., Biddle, D. A., Torres, C., & Malpica, A. (2002). Urinary bladder leiomyoma during pregnancy: Report of one case with immunohistochemical studies. Journal of Obstetrics and Gynaecology, 22(6), 683–685. https://doi.org/10.1080/0144361027620623330
7. Peng, S., Zhang, L., Hu, L., Chen, J., Ju, J., Wang, X., Zhang, R., Wang, Z., & Chen, W. (2015). Factors influencing the dosimetry for high-intensity focused ultrasound ablation of uterine fibroids: A retrospective study. Medicine, 94(13), e650. https://doi.org/10.1097/MD.0000000000000650
8. Przudzik, M., Derkaczew, M., Łesiów, M., & Roslan, M. (2022). Asymptomatic bladder leiomyoma: A report of three cases treated with minimal invasive techniques and a review of literature. OncoReview, 12(3(47)), 59–64. https://doi.org/10.24292/01.OR.123301922
9. Zachariou, A., Filiponi, M., Dimitriadis, F., Kaltsas, A., & Sofikitis, N. (2020). Transurethral resection of a bladder trigone leiomyoma: A rare case report. BMC Urology, 20(1), 152. https://doi.org/10.1186/s12894-020-00722-2
10. Song, J., Song, H., & Kim, Y. W. (2022). Recurrent atypical leiomyoma in bladder trigone, confused with uterine fibroids: A case report. World Journal of Clinical Cases, 10(29), 10728–10734. https://doi.org/10.12998/wjcc.v10.i29.10728
11. He, L., Li, S., Zheng, C., & Wang, C. (2018). Rare symptomatic bladder leiomyoma: Case report and literature review. Journal of International Medical Research, 46(4), 1678–1684. https://doi.org/10.1177/0300060517752732
12. AlHalak, R., Alkabbani, S., Nasseif, H., Oghanna, N., & Janahi, F. (2022). Bladder leiomyoma treated with transurethral resection of bladder tumor (TURBT): Case report. International Journal of Surgery Case Reports, 98, 107464. https://doi.org/10.1016/j.ijscr.2022.107464
13. Al Solumany, A., Alobairi, Y., Abuzenada, M., Sulaiman, O. A., & Fatani, Sr, M. (2021). Open partial cystectomy of intramural bladder leiomyoma with unfavorable position: A rare case report. Cureus, 13(1), e12965. https://doi.org/10.7759/cureus.12965
14. Kashkoush, J., & Park, A. (2022). Bladder leiomyoma presenting as urinary retention: A case report. Urology Case Reports, 45, 102253. https://doi.org/10.1016/j.eucr.2022.102253
15. Pramod, S. V., Safriadi, F., Hernowo, B. S., Dwiyana, R. F., & Ksatriapraja, R. A. (2020). A large bladder leiomyoma. Urology Case Reports, 32, 101211. https://doi.org/10.1016/j.eucr.2020.101211

16. Stanescu, A., Smith, S. F., Ball, R., Reddy, U., & Tsiotras, A. (2022). A case report of bladder leiomyoma: An unusual bladder tumour. Journal of Surgical Case Reports, 2022(12), rjac580. https://doi.org/10.1093/jscr/rjac580
17. Baird, B. A., Ericson, C. A., Augustus, A., Geldmaker, L., Wajswol, E., & Young, P. R. (2022). Robotic transvesical bladder leiomyoma excision. Urology Case Reports, 43, 102054. https://doi.org/10.1016/j.eucr.2022.102054
18. Mavridis, C., Georgiadis, G., Lagoudaki, E. D., Skamagkas, I., Heretis, I., Koutsopoulos, A. V., & Mamoulakis, C. (2020). Bladder leiomyoma with synchronous solitary fibrous tumor of the pleura. Case Reports in Urology, 2020, 3717506. https://doi.org/10.1155/2020/3717506
19. Tobias-Machado, M., Pazeto, C. L., & Borges, R. C. (2020). Robot-assisted transvesical partial cystectomy for leiomyoma of bladder trigone. International Braz j Urol, 46(2), 300. https://doi.org/10.1590/S1677-5538.IBJU.2018.0801
20. Resende Júnior, J. A. D. (2018). Bladder outlet obstruction due to bladder leiomyoma – Case report and literature review. Open Access Journal of Urology & Nephrology, 01/01, 3doi. https://doi.org/10.23880/OAJUN-16000143
21. Delara, R., Wasson, M., & Khan, A. (2021). Bladder leiomyoma. Journal of Minimally Invasive Gynecology, 28(6), 1123–1124. https://doi.org/10.1016/j.jmig.2020.12.034
22. Li, A., Zhang, P., Zhang, M., Yang, T., Yue, Y., Chen, G., Li, W., & Fan, J. (2019). Transurethral enucleation of bladder leiomyoma: A series of six cases and review of the literature. Urologia Internationalis, 102(1), 102–108. https://doi.org/10.1159/000493150
23. Jain, S., Dahiya, P., Dahiya, K., Kamal, H., & Jain, N. (2019/08/01). Bladder leiomyoma: A diagnostic challenge. Journal of Gynecologic Surgery, 35(4), 276–278. https://doi.org/10.1089/gyn.2018.0065
24. Rey Valzacchi, G. M., Pavan, L. I., Bourguignon, G. A., Cortez, J. P., Ubertazzi, E. P., & Saadi, J. M. (2021). Transvesical laparoscopy for bladder leiomyoma excision: A novel surgical technique. International Urogynecology Journal, 32(9), 2543–2544. https://doi.org/10.1007/s00192-020-04557-1
25. Sharma, A., Vadi, S. K., Sood, A., Kumar, S., Mete, U. K., Parkhi, M., & Mittal, B. R. (2018). Bladder leiomyoma: A rare differential and a potential pitfall in the evaluation for a bladder mass in 18F-Fluorodeoxyglucose-positron emission tomography/computed tomography. Indian Journal of Nuclear Medicine: IJNM: The Official Journal of the Society of Nuclear Medicine, India, 33(3), 264–265. https://doi.org/10.4103/ijnm.IJNM_40_18
26. Yoshioka, T., Kawakita, M., & Kameoka, H. (2019). Cystoscope-assisted laparoscopic enucleation of a large progressive bladder leiomyoma. Journal of Endourology Case Reports, 5(3), 120–123. https://doi.org/10.1089/cren.2019.0015
27. Kölükçü, E., Parlaktaş, B. S., Deresoy, F. A., Beyhan, M., & Özbek, L. M. (2019). Bladder leiomyoma: A case report and brief review of literature. Journal of Surgery and Medicine, 3(5), 411–413. https://doi.org/10.28982/josam.560757
28. Scanlon, L., Canavan, J., Babiker, Z., Shilling, C., Daly, P., & Cullen, I. M. (2023). Leiomyoma of the Bladder: A case report and review. Irish Medical Journal, 116(6), 792–792.
29. Manoj, S., & Joshi, A. S. (2022). Laparoscopic partial cystectomy for leiomyoma of urinary bladder-A case report with review of literature. Radiology, 7(4), D1–D3.
30. A, S. A. A., A, A. J. A., & A, Z. S. K. (2018). Leiomyoma of the urinary bladder – A case report and review of literature. Annals of the College of Medicine, Mosul, 40(2), 74–76. https://doi.org/10.33899/mmed.2018.160006
31. Prayer-Galetti, T., Scagliori, E., Stramare, R., Tregnaghi, A., Dal Moro, F., Zattoni, F., Paola Gardiman, M., & Soligo, M. (2018). Incidental urinary bladder leiomyoma: A successful long term conservative treatment based on pre-operatory magnetic resonance imaging findingsr. Journal of Cancer Research and Oncobiology, 1(4), 116. https://doi.org/10.31021/jcro.20181116
32. Ramesh, G., & Reeves, W. B. (September 2002). TNF-alpha mediates chemokine and cytokine expression and renal injury in cisplatin nephrotoxicity. Journal of Clinical Investigation, 110(6), 835–842. https://doi.org/10.1172/JCI15606
33. Ramesh, G., & Reeves, W. B. (2005/07/01). p38 MAP kinase inhibition ameliorates cisplatin nephrotoxicity in mice. American Journal of Physiology. Renal Physiology, 289(1), F166–F174. https://doi.org/10.1152/ajprenal.00401.2004
34. De Berne-Lagarde, A. (1929). Les leiomyomes vesicaux. Arch. d'Mal des Reins des Organes Genitourin, 4, 412–441.
35. Campbell, E. W., & Gislason, G. J. (1953). Benign mesothelial tumors of the urinary bladder: Review of literature and a report of a case of leiomyoma. Journal of Urology, 70(5), 733–741. https://doi.org/10.1016/S0022-5347(17)67977-1
36. Silva-Ramos, M., Massó, P., Versos, R., Soares, J., & Pimenta, A. (2003). Leiomyoma of the bladder. Analysis of a collection of 90 cases. Actas Urológicas Españolas, 27(8), 581–586. https://doi.org/10.1016/s0210-4806(03)72979-9
37. Park, J. W., Jeong, B. C., Seo, S. I., Jeon, S. S., Kwon, G. Y., & Lee, H. M. (2010). Leiomyoma of the urinary bladder: A series of nine cases and review of the literature. Urology, 76(6), 1425–1429. https://doi.org/10.1016/j.urology.2010.02.046
38. He, L., Li, S., Zheng, C., & Wang, C. (April 2018). Rare symptomatic bladder leiomyoma: Case report and literature review. Journal of International Medical Research, 46(4), 1678–1684. https://doi.org/10.1177/0300060517752732
39. Knoll, L. D., Segura, J. W., & Scheithauer, B. W. (1986). Leiomyoma of the bladder. Journal of Urology, 136(4), 906–908. https://doi.org/10.1016/s0022-5347(17)45124-x
40. Maya, M. M., & Slywotzky, C. (1992). Urinary bladder leiomyoma: Magnetic resonance imaging findings. Urologic Radiology, 14(3), 197–199. https://doi.org/10.1007/BF02926929
41. Tomoe, H., Okumura, T., Nakamura, M., Toma, H., Ishikawa, H., & Kohno, A. (1991). Evaluation with MR imaging of leiomyoma of the bladder. Urologia Internationalis, 46(4), 349–351. https://doi.org/10.1159/000282165
42. Giuliani, E., As-Sanie, S., & Marsh, E. E. (2020). Epidemiology and management of uterine fibroids. International Journal of Gynaecology and Obstetrics, 149(1), 3–9. https://doi.org/10.1002/ijgo.13102

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