Oncology

Submucosal lipoma of the urinary bladder: Case report and systematic review

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Introduction

Lipomas, benign tumours of adipose tissue, are the most common soft-tissue tumours in adults. They are usually classified according to their histological morphology, with conventional lipomas being the most common variant. The conventional lipoma is described as a well-encapsulated mass of mature adipocytes, most commonly in the superficial tissues of the proximal limbs and trunk.1

Visceral lipomas are less common than their superficial counterparts, but share a similar histopathological morphology. Lipomas of the urinary bladder are particularly rare and few cases have been documented. Their clinical presentation is non-specific, with the diagnosis usually made by endoscopic biopsy.2

Case report

A 66-year-old gentleman of middle-eastern ethnicity was referred for an incidental bladder lesion noted on trans-abdominal ultrasound, which had initially been ordered for renal impairment investigation. He denied lower urinary tract symptoms (LUTS) or previous urinary tract infections. Urine microscopy revealed microscopic haematuria and small numbers of atypical urothelial cells. Ultrasound imaging showed a 4.9 × 6.9mm, echodense lesion on the posterior wall of the bladder (Fig. 1). Serum creatinine was 179 μmol/L. His past medical history was significant for chronic kidney disease, significant smoking history, congestive heart failure, type-2 diabetes mellitus and an atrial myxoma diagnosed many years previous.

Cystoscopy with bilateral retrograde pyelography was performed to exclude a renal tract abnormality. Bilateral retrograde pyelograms were normal. A smooth, tan-coloured, round lesion with what appeared to be normal overlying mucosa was seen projecting from the posterior wall of the bladder. The lesion was cold cup biopsied for histological examination.

Microscopy revealed mature adipocytes without atypia, enveloped by disorganised and attenuated urothelium with a maintained umbrella cell layer (Fig. 2a). Immunohistochemical staining for CK20 expression, which is associated with urothelial dysplasia, was positive and highlighted the overlying umbrella cell layer (Fig. 2b).3 There was no evidence of muscularis propria involvement.

A diagnosis of a submucosal lipoma without malignancy was made histologically. Liposarcoma was thought to be unlikely due to absence of hyperchromasia or multi-nucleated stromal cells. The patient’s post-operative stay was unremarkable, and he was discharged from hospital without incident. Twelve months later the patient was discharged from the urology service with no persistent urological symptoms.

Discussion

Urinary tract tumors can be broadly divided into epithelial or mesodermal origin. Urothelial derived tumors account for ~95% of bladder tumors and are often malignant.2 Whereas, mesodermal tumors are exceptionally rare and often benign. Of the mesenchymal tumours of the bladder, leiomyoma is most common.2 As mentioned previously, a lipoma arising from the wall of the urinary bladder is uncommon, with less than 20 cases published in the international literature.

Lipomas, are the most common mesenchymal tumours of adulthood.1 They are sub-classified according to morphological features under microscopy. The conventional lipoma, a well-encapsulated mass of mature adipocytes, is the most common subtype. Conventional lipomas often arise in subcutaneous tissue of proximal extremities and the trunk and are rarely associated with viscera. Regardless of location, conventional lipomas commonly reveal chromosomal re-arrangements.
in chromosomes 12q, 6p and 13q.  

A benign lipoma arising from the wall of the urinary bladder is a separate condition to the more common, although still infrequent, pelvic lipomatosis. In this condition, multiple lipomatous lesions arise from naturally-occurring peri-rectal and peri-vesical adipose tissue and often compresses pelvic viscera or associated structures. Bladder lipomas are distinct from this disorder in that they are confined to the bladder wall submucosa, and do not compress or obstruct pelvic contents. Interestingly, pelvic lipomatosis also appears to have a distinct genetic origin to that of conventional lipomas, with re-arrangements found in chromosomes 1 and 8. Another important differential diagnosis includes the previously mentioned well-differentiated Liposarcoma, with its distinctive microscopic findings of nuclear atypia, multi-nucleated stromal cells, and occasional lipoblasts.

**Literature review**

Despite being reported in 1957, a literature review of PubMed, MEDLINE, EMBASE and Cochrane databases yielded only 13 documented English-language cases, including that discussed in this report (Table 1). The age at presentation of these cases ranged from 32 to 75 (Median 57, SD 11.6). Patient ethnicity was inconsistently reported, but bladder lipomas were described in patients from Asian, Middle-Eastern and Caucasian locales. Nine of the 13 cases (69.2%) were reported in male patients. Of the 13 reports, 3 cases, including our own, described a patient with a significant smoking history.

Haematuria is the most common clinical feature associated with bladder lipomas, with 8 of the 13 (61.5%) cases reporting either microscopic or macroscopic haematuria. Haematuria may be attributed to excoriation of the overlying bladder lipoma mucosa. LUTS are also common, with 6 reports (46%) describing either urgency, frequency, dysuria or incontinence.

Cystoscopically, twelve reports described the appearance as endophytic, smooth, yellow-coloured, mass lesion of the urinary bladder wall, with a varying degrees of pedunculation. The one exception is the case described by Ukita et al. whereby a single lipoma arising from the

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**Table 1**

Review of Bladder Lipomas reported in English-Language Publications.

| Author & Year | Age (years) | Sex | Imaging Performed | Number, Location, Max. Size | Haematuria | Lower Urinary Tract Symptoms |
|---------------|-------------|-----|-------------------|----------------------------|------------|-----------------------------|
| Eggener SE et al., 2001 | 53 | M | CT | One, posterior wall, 13mm | Microscopic | Not reported |
| Ulker S et al., 2001 | 32 | M | CT | One, L lateral wall, 7mm | Microscopic | Not reported |
| Meraj S et al., 2002 | 53 | M | Urography | One, posterior wall, not reported | Microscopic | Frequency/Urgency |
| Kunkle DA et al., 2005 | 48 | M | MRI | Two, Anterior + L lateral wall, not reported | Microscopic | Frequency/Urgency |
| Lang EK et al., 2005 | 73 | M | CT | Multiple, trigone, 6–8mm | Macroscopic | Nil |
| Lang EK et al., 2005 | 54 | M | CT | Multiple, trigone, 7–9mm | Macroscopic | Not reported |
| Brown C et al., 2008 | 44 | M | MRI, USS | One, Dome, not reported | Microscopic | Dysuria |
| Ukita S et al., 2009 | 61 | F | MRI | One, R retropelvic cavity, 150mm | Microscopic | Frequency/Urgency |
| Tsui JF et al., 2013 | 59 | F | CT | Two, anterior wall, 12mm & 8mm | Microscopic | Frequency/Urgency |
| Akan S et al., 2014 | 69 | F | USS | One, R Lateral, 15mm | Microscopic | Incontinence |
| Ates M et al., 2015 | 77 | F | MRI, USS | One, Dome, 7mm | Normal | Dysuria |
| Val-Bernal JF et al., 2015 | 75 | M | CT | One, Dome, 5mm | Microscopic | Not reported |
| Gilbert B et al., 2018 | 66 | M | USS | One, Posterior wall, 6mm | Microscopic | Nil |
Bladder wall was seen to be exophytic and extending into the retrovesical space. Bladder lipomas have been observed arising from all anatomical areas of the urinary bladder wall, with the most common location being the trigone or posterior wall (5 of 13 cases, 38.4%) but ureteric orifice obstruction is rare. The histological appearance of all 13 reported tumours were similar. All reports noted an encapsulated lesion of mature adipocytes, without cellular atypia and without invasion into smooth muscle.

Every endophytic lesion were managed with cystoscopy and transurethral tumor resection. Ukita et al., laparoscopically excised the exophytic bladder lipoma. Where LUTS were the clinical presentation, these symptoms appeared to resolve post-excision of the lipoma. No recurrences have been noted in the available literature, although none comment about patient outcomes at greater than 12 months post-operatively.

Conclusion

Bladder lipomas are uncommon and clinical presentation is varied but often includes haematuria and LUTS. Despite radiological findings on USS, MRI and CT, the definitive diagnosis of bladder lipoma is histologically. Resection of the lipoma improved symptoms in patients presenting with LUTS. The above report represents the most comprehensive review of the presentation, diagnosis and management of bladder wall lipoma yet published.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.eucr.2018.06.008.

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