Inflammatory pseudotumor in the urinary bladder

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KEY WORDS

inflammatory pseudotumor ◗ leiomyosarcoma ◗ urothelial carcinoma of the bladder

ABSTRACT

Inflammatory pseudotumor is a rare lesion in the urinary bladder, difficult to differentiate from bladder malignancies on clinical grounds only. We present a case report of the inflammatory pseudotumor of the bladder in a 26 year-old female, who sought medical advice due to non-specific discomfort in the perineal region and lower abdomen. On ultrasound scan and computed tomography a mass in the left pelvic cavity was identified, attached to the wall of the bladder, compressing the left ovary. The patient was treated surgically with partial cystectomy. A diagnosis of inflammatory pseudotumor was made on histologic assessment of the surgical specimen. Five years of follow-up has been relapse-free in this patient. Due to the relative rarity of inflammatory pseudotumor in the bladder, no diagnostic and treatment algorithm for this entity has been created to date.

INTRODUCTION

Inflammatory pseudotumor (IP), first described in 1980 by Roth, is a proliferation of myofibroblasts, rarely occurring in the urinary bladder [1]. Clinical symptoms and signs as well as radiological findings are non-specific, thus making distinction from bladder malignancies including sarcomas and urothelial carcinoma, difficult on clinical grounds only. Inflammatory pseudotumor can occur at any age and the most frequent symptom is painful hematuria. The lesion can reach over 10 cm in greatest dimension [2]. Rare cases of IP`s coexistence with other bladder malignancies were reported, but no metastatic spread has been described so far. Cases of spontaneous regression of the lesion can be found in literature, but are increasingly rare. The importance of accurate diagnosis is often emphasized in cases of IP as it allows appropriate patient management without the need for unnecessary extensive surgery, as performed for bladder malignancies, including sarcomas [3]. A case of the inflammatory pseudotumor of the bladder treated surgically is presented in this paper.

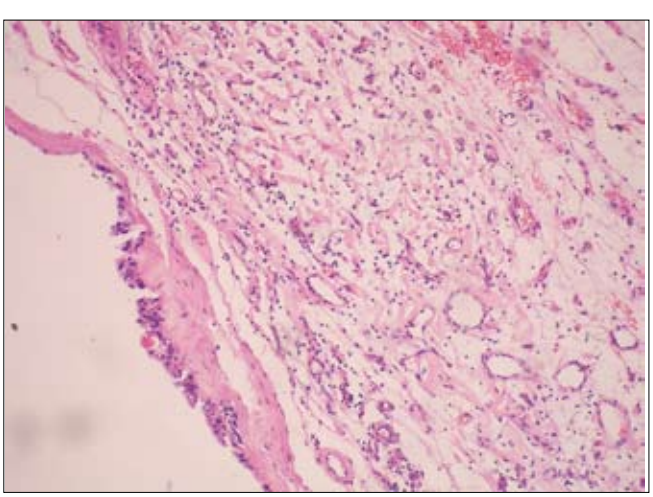

Fig. 1. Inflammatory pseudotumor consisting of small oval-shaped wells embedded in a hyalinizing, myxoid and edematous stroma, accompanied by numerous blood vessels. Mucosal urothelium seen in the bottom left corner. (H&E, low-power magnification).

CASE REPORT

The patient was a 26 year-old female seeking medical advice due to nonspecific discomfort in the lower abdomen and perineal region. On ultrasound scan and computed tomography a mixed density mass in the left pelvis was detected, thought to be attached to the urinary bladder wall. On radiologic assessment there was a pathological mass in and in contact with the rectum and compressing the left ovary. The greatest diameter of the lesion was 5 cm. Urography revealed a smooth, rounded filling defect of the bladder consistent with a mass protruding into the bladder cavity. The patient was qualified for surgical treatment. Laparotomy was performed, where a mass 4 cm in greatest dimension was seen arising from the left bladder wall. Partial cystectomy was performed with the surgical specimen containing the mass with adjacent grossly uninvolved bladder wall. The post-surgical recovery period was uneventful, with no significant complications noted.

Pathologic assessment

The specimen contained bladder wall fragments lined by intact mucosa and covered by normal-appearing serosa. The fragments

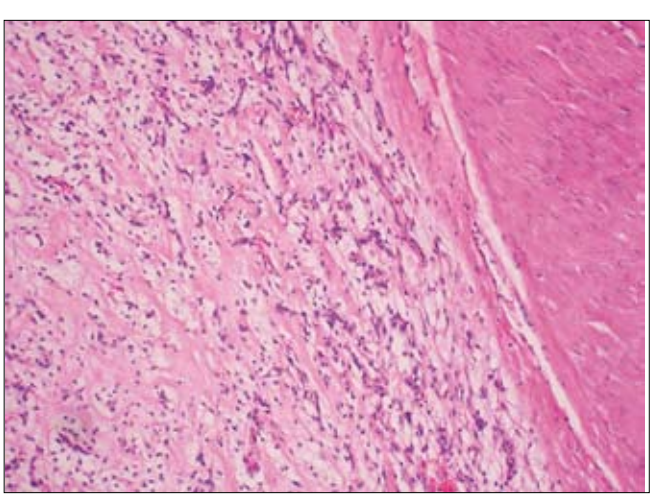

Fig. 2. Inflammatory pseudotumor abutting on muscularis propria of the bladder (H&E, low-power magnification).

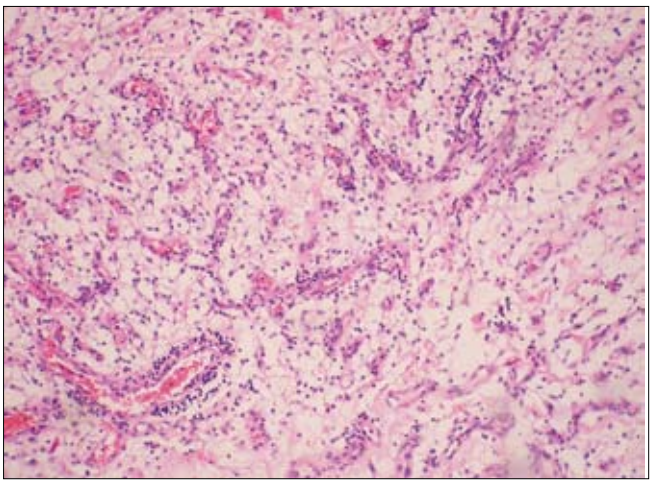

Fig. 3. Inflammatory pseudotumor with stromal lymphocytic sprinkling (H&E, low-power magnification).

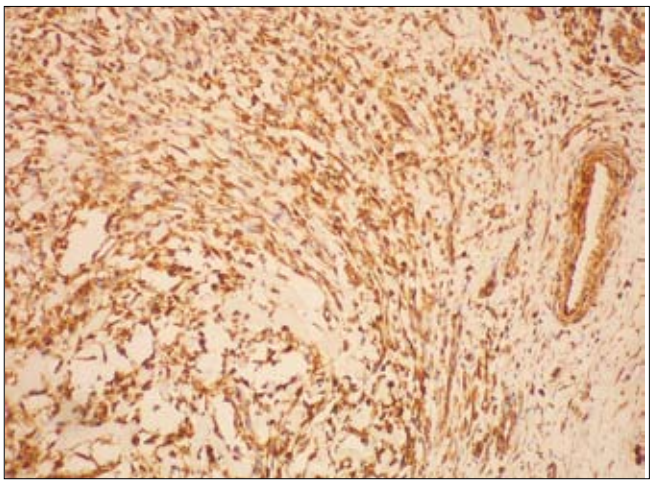

Fig. 4. Positive vimentin immunostaining.

also contained a pale and hemorrhagic-looking infiltrate measuring 5.5 cm in greatest diameter, diffusely penetrating the *muscularis propria*. Microscopically a spindle-cell proliferation was seen showing no significant cellular atypia or mitotic activity. There was no evidence of necrosis or vascular invasion. The spindle cells were seen embedded in a partly hyalinized, partly myxoid stroma, and accompanied by numerous thin-walled blood vessels. Focal inflammatory infiltrate of lymphocytes and plasma cells was noted. The lesion showed diffuse penetration of full bladder wall thickness, including the muscular layer. No evidence of dysplasia or neoplasia of the overlying urothelium was seen. The differential diagnosis included spindle cell (sarcomatoid) carcinoma, sarcomas, particularly leiomyosarcoma and rhabdomyosarcoma, PEComa, and eventually inflammatory pseudotumor. Immunohistochemical studies were performed and the lesion was Vimentin positive and smooth muscle actin [SMA] positive with no expression of cytokeratin [AE1/AE3 and CAM 5.2], desmin, myogenin, HMB45, or ALK-1. Proliferative activity as marked by a Ki-67 [MIB-1] immunostain was seen in less than 5% of cells. A diagnosis of inflammatory pseudotumor was made. The nearest surgical margin was 0.1 cm. (Figs. 1, 2, 3, 4, 5 and 6).

No evidence of relapse was noted in the 5 years of follow-up. The patient, still closely monitored in our clinic, was able to give birth to a healthy child.

DISCUSSION

Inflammatory pseudotumor has been variously termed as a pseudosarcomatoid myofibroblastic proliferation, pseudomalignant spindle cell proliferation, pseudosarcoma, nodular fasciitis of the bladder or reactive pseudosarcomatous reaction [4]. In 1985 the term "inflammatory pseudotumor" was used by Nochomovitz and Orenstein [5]. The lesion is frequently grouped together with cases of the so-called postoperative spindle cell nodule; a term coined in 1984 by Proppe et al. for a proliferative spindle cell lesion occurring in the lower urinary tract and female genital tract shortly after and at the site of surgical procedures [6]. Both entities are separated depending on symptoms and relation to previous surgery. The most common symptoms of IP include painful hematuria, urinary frequency, and pelvic pain [6]. Rich vascularity of the lesion and frequent surface ulceration are likely causes of intravesical bleeding. The appearances on cystoscopy are non-specific; a polypoid, nodular, or broad-based mass as well as an ulceration can be seen [7]. Meticulous pathologic assessment is necessary to avoid a misdiagnosis of a malignancy. Differential diagnosis for inflammatory pseudotumors includes, among others, leiomyosarcoma and urothelial carcinoma. Harik et al. emphasized key histologic features helping distinguish between an IP and a sarcoma. Diagnosis of inflammatory pseudotumor is more likely in cases with no nuclear atypia and lack of vascular invasion. Increased mitotic activity and

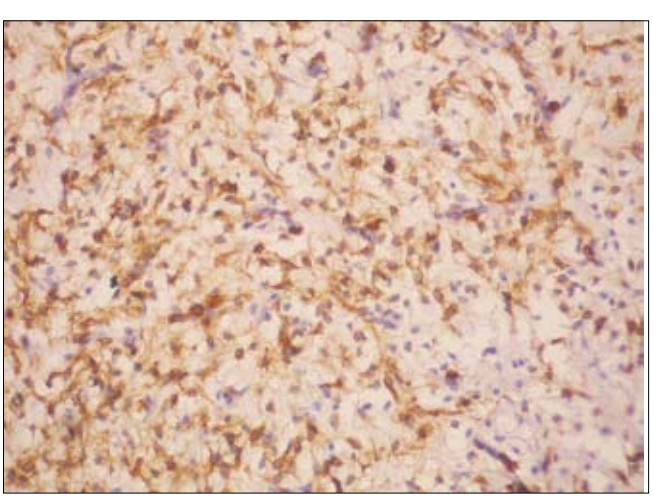

Fig. 5. Positive smooth muscle actin (SMA) immunostaining.

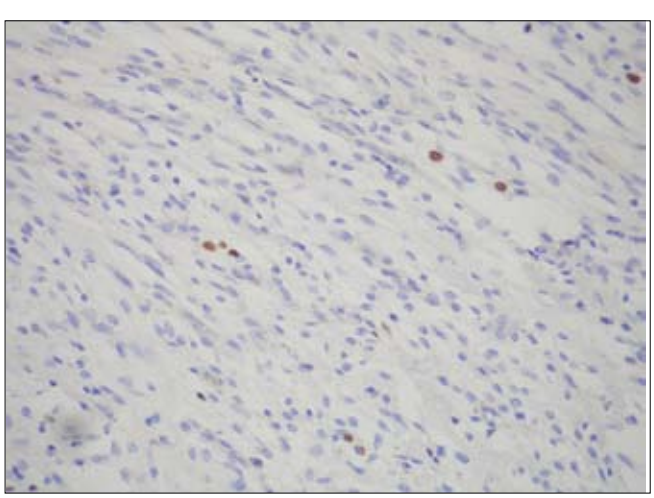

Fig. 6. Proliferative index as assessed on Ki-67 (MIB-1) immunostaining. Positive nuclear staining seen in approximately 1% of cells.

necrosis in conjunction with extensive penetration of the bladder muscular layer and perivesical fat are not entirely typical of IP [7].

Immunohistochemistry can be of assistance in histologic diagnosis, including reactions with antibodies to vimentin, smooth muscle actin, S-100 protein, and alpha-1-antichymotrypsin. Cytokeratin expression is not characteristic of this lesion [8]. All cases show expression of vimentin and ALK-1 expression is seen less frequently. The latter is consistently seen in cases of IP of the eye and oral cavity, less frequently in lesions located in the urinary bladder [9]. Expression of broad-spectrum cytokeratins was reported in a few cases [2].

Inflammatory pseudotumor can also arise from the urachus, but this occurrence is extensively rare with three cases reported so far [10]. Clinical symptoms and patient management are analogous to those in cases arising in the bladder. Inflammatory pseudotumor can also be seen in other organs beyond the urinary tract; lesions located in the lungs, bronchial wall, gastrointestinal tract wall, or thyroid gland were reported [8].

Patient management includes transurethral resection or partial cystectomy. Radical cystectomy appears to be an over treatment considering the benign nature of this lesion. The clinical course of IP is not identical in all cases [2]. Massive lesions measuring up to 37 cm in greatest diameter were reported with extensive infiltration of the bladder wall, perivesical fat, omentum and peritoneum complicated by hydronephrosis and urosepsis. However, most cases of IP have a benign clinical course. Metastatic spread has not been seen and local relapse is an infrequent finding. Although conservative therapy is not warranted, Sandhu and Iacovou reported a case of IP extensively infiltrating the bladder wall and rectum. Four-month treatment with antibiotics resulted in a complete regression of the lesion [11]. Gotfrit et al. analyzed 809 cases of low-grade bladder cancer noting that a coexisting IP (2% of cases studied) increased the risk of relapse and progression of cancer as well as malignancy-related death [3]. The need for close follow-up with cystoscopy and mucosal mapping biopsies was emphasized.

CONCLUSIONS

Inflammatory pseudotumor is a benign, reactive, myofibroblastic proliferation, rarely occurring in the urinary bladder, which has to be distinguished from bladder malignancies including sarcomas and urothelial carcinoma. The histologic pattern of a spindle cell proliferation without atypia, necrosis and vascular invasion, accompanied by a characteristic immunoprofile allows proper diagnosis. Transurethral resection of the lesion or partial cystectomy are preferable treatment methods with long-term cure. The rare occurrence of this entity and a clinical picture not dissimilar from bladder malignancies requires an appropriate diagnostic and therapeutic approach as well as close post-surgical follow-up.

REFERENCES

1. Roth JA: *Reactive pseudosarcomatous response in urinary bladder.* Urology 1980; 16: 635-637
2. Iczkowski KA, Shanks JH, Gadaleanu V: *Inflammatory pseudotumor and sarcoma of urinary bladder: differential diagnosis and outcome in thirty-eight spindle cell neoplasms.* Mod Pathol 2001; 14: 1043-1051.
3. Gofrit ON, Pode D, Shapiro A et al: *Significance of inflammatory pseudotumors in patients with a history of bladder cancer.* Urology 2007; 69 (6): 1064-1067.
4. Lundgren L, Aldenborg F, Angervall et al: *Pseudomalignant spindle cell proliferations of the urinary bladder.* Hum Pathol 1994; 24: 181-191.
5. Nochomovitz LE, Orenstein JM: *Inflammatory pseudotumor of the urinary bladder: possible relationship to nodular fasciitis - two case reports, cytologic observations, and ultrastructural observations.* Am J Surg Pathol 1985; 9: 366-373.
6. Bulusu AS, Hopkins T: *Inflammatory pseudotumor of the bladder* Urology 1998, 51: 487-488.
7. Harik LR, Merino C, Coindre JM et al: *Pseudosarcomatous myofibroblastic proliferations of the bladder: a clinicopathologic study of 42 cases.* Am J Surg Pathol 2006; 30: 787-794.
8. Choi SK, Choi YD, Cheon SH et al: *Inflammatory pseudotumor of the urinary bladder in a child.* Yonsei Med J 2000; 41 (3): 401-403.
9. O'Malley DP, Poulos C, Czader M et al: *Intraocular inflammatory myofibroblastic tumor with ALK overexpression.* Arch Pathol Lab Med 2004; 128 (1): 5-7.
10. Tunca F, Sanli O, Demirkol K, Gulluoglu M: *Inflammatory pseudotumor of urachus mimicking invasive carcinoma of bladder.* Urology 2006; 67 (3): 623.e1-623.e3.
11. Sandhu SS, Iacovou JW: *Pseudotumor of the bladder.* J R Soc Med 1997; 90: 46-47.

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