CASE REPORT

Primary Mucin Secreting Adenocarcinoma Bladder: a Case Series

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Received: 11 April 2017 / Accepted: 24 July 2017 / Published online: 29 July 2017
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Abstract Primary mucinous adenocarcinoma is an extremely rare type of bladder cancer. These tumours may have varied presenting complains with isolated mucusuria in some patients. As it is difficult to differentiate primary from secondary tumours, it is often a diagnostic dilemma. We narrate three cases of primary mucinous adenocarcinoma bladder and try to bring out the clinical and pathological features unique to this tumour along with the diagnostic importance of immunohistochemistry.

Keywords Mucinous · Adenocarcinoma · Urinary bladder · Immunohistochemistry

Introduction

Primary adenocarcinomas account for less than 2% of all bladder cancers, and the mucinous subtype is even rare [1]. We present three cases of primary mucinous adenocarcinoma bladder with distinct clinical presentation and pathological features that required different management strategies.

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Case 1: A 70-year-old lady presented with mucusuria and recurrent urinary tract infection (UTI). There was no hematuria. Examination revealed distended bladder till umbilicus. On catheterization, thick mucoid fluid was drained. Abdominal computerized tomography (CT scan) revealed irregular enhancing focal thickening over the right wall and dome of the bladder with air pockets within over distended bladder. Cystoscopy and biopsy was done. Histology showed adenocarcinoma with extracellular pools of mucin infiltrating into the muscle.

Case 2: A 46-year-old male presented with painless hematuria. CT abdomen revealed an enhancing urachal mass (18 × 20 mm) with a lesion (30 × 40 mm) at the dome of the bladder. Cystoscopy and biopsy from the proliferative lesion along with mapping biopsies from bladder were taken. Histopathology revealed mucinous adenocarcinoma of the bladder. Mapping biopsies showed normal urothelium.

Case 3: A 76-year-old gentleman diagnosed with urothelial bladder tumour (at another centre) 3 months back came to us for surveillance cystoscopy. Slide review at our institute was suggestive of villous adenoma. Cystoscopy revealed a 2 × 2 cm nodular lesion covered with mucus on the anterior wall of the bladder, which was resected. Histology was suggestive of predominantly villous adenoma with extracellular pools of mucin and areas suspicious of adenocarcinoma (Fig. 2a, b). CT abdomen was done which confirmed organ-confined disease.

In all the three cases, extensive workup ruled out the possibility of an occult primary tumour with metastasis to bladder (colonoscopy, upper gastro-intestinal endoscopy (UGIE), and carcinoembryonic antigen (CEA)). Immunohistochemistry (IHC) confirmation of diagnosis was done in all cases (Fig. 1). All patients underwent definitive surgical treatment,

Fig. 1 IHC showing diffuse positivity for CK20, HMWK, CEA, and CK7 (clockwise)

and histopathology of the main surgical specimen was consistent with primary mucin secreting adenocarcinoma of the bladder. Details of patients and IHC have been given in Table 1.

Discussion

Chronic inflammation of bladder mucosa induces metaplasia of epithelium with further progression to adenocarcinoma. In one of our cases, it is possible that the repeated episodes of UTI induced metaplasia. Therefore, a full urologic workup is warranted if symptoms of UTI fail to resolve with antibiotics. Though hematuria is the most common presenting symptom, isolated mucusuria may be seen in 25% of the cases and may mimic UTI [1]. To establish the diagnosis of primary adenocarcinoma bladder, it is desirable to rule out an occult primary in the rectum, stomach, endometrium, breast, prostate, and ovaries, as these are rare bladder tumours [2]. FDG PET has a lower sensitivity for detection of primary and recurrent mucinous carcinoma, which might be attributed to the low cellularity caused by the presence of abundant mucin [3]. PET scan to detect distant metastasis was done in one

patient that showed no site of significant activity (including the primary tumour). Adenocarcinomas have variable immunophenotype on IHC depending on the organ of origin, which help in differentiating primary from secondary bladder tumours. Primary bladder adenocarcinoma expresses CEA, CDX-2, Mucin-1 (MUC-1), MUC-2, and MUC-3, the same as colonic adenocarcinoma. Cytokeratin 7 and 20 (CK7, CK20) are positive in varying combination in bladder adenocarcinoma in contrast to colon that expresses CK20 but not CK7. All urachal adenocarcinomas on the other hand express CK20 and CDX2 and show variable expression of CK7, β -catenin, and high-molecular cytokeratin (HMWK) [4]. Benign bladder lesions like villous adenoma and nephrogenic adenoma can be mistaken for adenocarcinoma [5] (Fig. 2). One of the patients initially labelled as villous adenoma was later found to have mucinous adenocarcinoma on histopathology of the main surgical specimen. Villous adenomas of bladder are rare with less than 30 cases described. Upto half of the villous adenomas have been associated with adenocarcinoma in situ or invasive adenocarcinoma; therefore, a careful search for the invasive component is essential [5]. The treatment for primary adenocarcinoma of the bladder is radical cystectomy and pelvic lymph node dissection. For urachal tumours, en

Table 1 Patient and tumour characteristic

	Sex	Age	Symptom	Primary site	Surgery	IHC positivity
1	Female	70	UTI, mucusuria	Bladder	RC + PLND	CK20
2	Male	46	Hematuria	Urachus	PC with en bloc removal of urachus and umbilicus) with PLND	CEA, CK7, HMWK
3	Male	76	Hematuria	Bladder (with villous adenoma)	PC	CK7, CK20

RC radical cystectomy, PLND pelvic lymph node dissection, PC partial cystectomy, CK cytokeratin, CEA carcinoembryonic antigen, HMWK high-molecular weight keratin

Fig. 2 Haematoxylin and eosin photomicrograph (10×) showing **a** tubulovillous and branching pattern lined by columnar epithelium with no invasion (villous adenoma) **b** a muscle invasive neoplasm composed of dilated glands with intracytoplasmic mucin

bloc resection of the bladder dome, urachal ligament, and umbilicus is the standard of care. Urachal tumours tend to have a better 5-year overall survival rate than nonurachal cancers (48 versus 35%) [5].

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