

Squamous cell carcinoma caused by neglected giant bladder diverticulum stone

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KEY WORDS

bladder diverticulum ► bladder stone ► squamous cell carcinoma

ABSTRACT

The incidence of bladder diverticulum is approximately 1.7% in children and 6% in adults. Dysplasia, leukoplakia, and squamous metaplasia may develop in approximately 80% of diverticulum. Chronic infection and inflammation, secondary to urinary stasis have been suggested as the cause of this situation. Bladder tumors arising inside of a diverticulum are uncommon, with a reported incidence ranging from 0.8% to 10% so discussions related to the diagnosis and the treatment of these cases are pending. The most common histological subtype of diverticulum tumors are transitional cell carcinoma (TCC) and squamous cell carcinoma (SCC), constitute 70-80% and 20-25% of all tumors respectively. TCC together with SCC is reported as 2% of all tumors, adenocarcinoma constitutes only a 2% portion. Stasis in the diverticulum may give rise to stone formation. Literature holds a large number of cases dealing with squamous cell carcinoma caused by bladder diverticulum. Until now, a case report depicting the coexistence of these pathologies (SCC, diverticulum and diverticulum stone) simultaneously in one case has not been reported. In our case, neglected bladder diverticulum stones may have caused SCC. Our case was treated with radical cystectomy. Urologists should be vigilant in this regard and diverticulum should be managed before complications happen.

INTRODUCTION

Bladder diverticulum is herniation of the bladder mucosa through bladder wall musculature (detrusor muscle). The incidence of bladder diverticulum is approximately 1.7% in children and 6% in adults [1]. Dysplasia, leukoplakia, and squamous metaplasia develop in approximately 80% of diverticulum. Chronic infection and inflammation, secondary to urinary stasis have been suggested as the cause of this situation [2].

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Stasis in the diverticulum may give rise to stone formation. These stones may be in various sizes and shapes. Literature holds a large number of cases dealing with squamous cell carcinoma caused by bladder diverticulum, but it is notable that there is an inexistence of a publication dealing with the coexistence of bladder diverticulum, bladder stones, and SCC in one case.

CASE REPORT

A sixty-four year old male patient presented with macroscopic hematuria and irritative symptoms in February of 2008. There are no comorbidities. In the patient's history, bladder stone has been known for 20 years, but the patient did not allow implementation of treatment. Abundant erythrocytes were present in the urine analysis, but bacteria were not detected in the urine culture. Bladder wall thickness was increased and was irregular on the left side in ultrasonographic (USG) evaluation. An opacity that was approximately 6 cm in longest axis was monitored on the left pelvic bone in kidney-ureters-bladder (KUB) radiography (Fig. 1). Abdominopelvic computed tomography (CT) revealed left hydronephrosis, diverticulum, stone formation in the diverticulum with size of 4 x 6 x 4 cm, and rear wall thickness adjacent to the left bladder wall was increased (Fig. 2).

In cystoscopy the left side of the bladder was covered with necrotic tissue, solid-looking tumor formation was monitored, and transurethral resection was performed. SCC was reported in histopathologic examination. Pelvic magnetic resonance imaging (MRI) revealed that the mass in the left lateral bladder wall was causing compression of and invasion to the left ureter, while creating a proximal dilatation. Invasion to the left seminal vesicle was observed. Throughout the left lateral wall of the bladder there was contrast material involvement and a signal change associated with a neoplastic process. This observation was interpreted as a large bladder diverticulum with a huge stone surrounded by a neoplastic process. Distant metastases were not found with a detailed evaluation using bone scintigraphy and computed tomography.

Radical cystoprostatectomy (RSP), pelvic lymph node dissection (PLND), and ileal loop surgery were performed on the patient in May of 2009. In the macroscopic assessment of the RSP specimen there was a tumor located on left rear wall of the bladder with dimensions of 3.5 x 3 cm, of ulceroglandular type, and consisting of 7 yellow-brown stones inside a cavity with depth of 5.5 cm showing a stained white cavity. The pathologic report revealed it to be well differentiated pure SCC, histologic grade 1. The largest diameter of the tumor was 5.5 cm. The prostate was also invaded by the tumor (pT4a). However the tumor was not seen in surgical margins nor was invasion seen in the lymphadenectomy specimen.

DISCUSSION

Mucosal herniations through areas of congenital or acquired weakness in the muscular bladder wall are called diverticulum. It is formally known that bladder tumors originating within a diverticulum are uncommon. However, according to the current study,



Fig. 1. An opacity that is approximately 6 cm in longest axis on the left pelvic bone.

neoplastic changes were present in half of cases (36/71; 51%), including both noninvasive (16/36; 44%) and invasive (20/36; 56%) carcinoma. Patients with invasive carcinoma in diverticulum have an increased frequency of less common bladder cancer subtypes, and those with pT3 disease are at increased risk for subsequent progression. Only two patients (2.8%) had SCC in this study [4].

Bladder tumors originating within a diverticulum pose a diagnostic and therapeutic problem. Yagci et al. pointed out that the neoplasms originating from a bladder diverticulum are characterized by early transmural invasion and have a tendency for higher histopathological grades [5]. Cheng et al. corroborate this result and they indicate that the neoplasms originating in a bladder diverticulum are characterized by a high incidence of local recurrence [6]. Lack of muscle fibers in the diverticulum makes it difficult to stage the tumor. Therefore, theoretically the tumor invades earlier and more readily than in a normal bladder wall that contains thick muscle. This theoretical aspect has led many investigators to suggest that intra diverticular tumors staged pT2 should be neglected and stage pT3 should follow pT1 [6].

Early diagnosis and treatment are very important determinants in these tumors. Filling defects caused by intra-diverticular tumors may not always be visualized in intravenous urogram (IVU). Cystography may be insufficient for the diagnosis owing to the narrowed neck of diverticulum. Cross sectional imaging studies like US, CT, and MRI are being used with greater accuracy in the diagnosis and staging of intra-diverticular tumors. MRI imaging in oblique planes can facilitate the diagnosis by demonstrating the neck of the diverticulum. Also, T2 weighted images allow differentiation between tumor in a diverticulum and a necrotic extravescical mass [7]. We realized that CT is comparable to MRI for staging. This similarity may have resulted from the delay in our case.

The transurethral approach to diverticular tumors is frequently difficult due to the narrow diverticular neck and thin submucosal

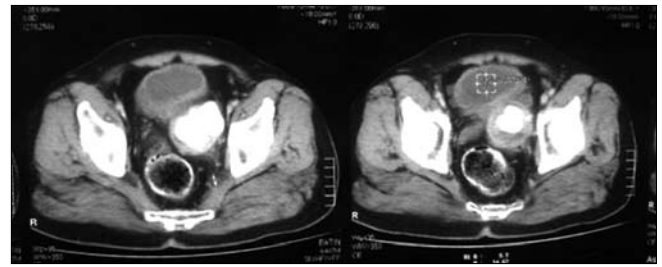


Fig. 2. Pelvic computerized tomography showing the bladder stone in the left lateral diverticulum and bladder wall thickening.

layers, rendering complete tumor resection routinely unobtainable [7]. In our case, the bladder neck and left side of the bladder wall were invaded by the tumor. According to CT and pathological findings of RSP material, the tumor originated from the diverticulum. Generally complete resection of large tumors within the bladder diverticulum may be difficult due to fear of bladder perforation and tumor spillage and, thus, clinical staging was unavailable. In most, TUR may be ineffective in controlling diverticular tumors. Consequently, some centers used a multimodal approach, which included surgery, radiation, and chemotherapy. SCC of the bladder frequently presents at an advanced stage, with many cases often proving unresectable at the time of initial diagnosis. Similarly in our case, when the patient presented to us his tumor was unresectable. Abe et al. reported a case of a 49 year old man who had a non-papillary tumor in the diverticulum who underwent total cystectomy, retroperitoneal node dissection, and construction of an ileal neobladder [8]. Histologically, it was SCC, pT3a, pN0. Seven months after the operation, the patient died of recurrent disease. Miura et al. reported a similar case [9], however, they preferred bladder preserving therapy. Pathological diagnosis after partial cystectomy was SCC, G1 >G2, pT3b. Postoperatively, 3 courses of adjuvant chemotherapy with methotrexate, bleomycin, and cisplatin were performed. The patient has remained free of recurrence for 4.5 years.

In our case, the character of the tumor was solid and the surface was irregular. TUR was performed for pathological sampling. The pathological report of TUR sampling was SCC, whereupon the patient underwent RSP with ileal loop diversion and PLND. Pathological diagnosis after RSP was SCC, G1 with prostatic invasion (pT4a). Lymph node metastasis was absent (pN0). There was a solid tumor 5 cm in diameter on the left side of the bladder and the core of the tumor had a cavity that had seven stones in macroscopic findings. Adjuvant chemotherapy was not performed. Eight months after the operation the patient has remained free of recurrence.

For the treatment of SCC of the bladder, RSP appears to provide a better option because of the most significant benefit to survival. The stage of the disease is very important for survival and was highest among patients with T2 disease. Down-staged tumors by preoperative irradiation had better survival than for those with no downstaging. However, no conclusions can be drawn about the efficacy of preoperative irradiation plus cystectomy for SCC, because too few patients treated in this way have been reported [10].

CONCLUSION

Neoplasia may occur and stones may develop in a bladder diverticulum. Until now, a case report depicting the coexistence of these pathologies (SCC, diverticulum, and diverticulum stone) simultaneously in one case has not yet been reported. In our case, neglected bladder diverticulum stones may have caused the SCC. Urologists should be vigilant in this regard and diverticulum should be managed before complications occur.

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