A hidden urinary bladder diverticular tumour: A diagnostic challenge

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ABSTRACT

Urinary bladder diverticulum tumour is rare. It has been estimated that only 2.6% of all bladder diverticulum develop malignancy and most were diagnosed late. Delay in diagnosis can be due to presence of intra-diverticular stone which can compress and hide any evidence of mucosal changes. We report the case of a 53-year-old man who presented with multiple lower urinary tract stone including in the urethra, bladder and bladder diverticulum. Serial investigations before a diagnosis of a bladder diverticulum adenocarcinoma were made. The tumour was hidden behind a stone.

Keywords: Bladder diverticular stone, bladder diverticular tumor, urolithiasis, bladder neoplasm

INTRODUCTION

Outpouching of the urothelial through the defects in the muscular walls of the urinary bladder is called a diverticulum. Diverticular of the urinary bladder can be congenital or acquired. Majority of bladder diverticulum in adult is acquired whereas in the paediatric age group is congenital type. The presence of diverticulum in urinary bladder was reported to be 23.4% in cadaveric study. [1] These diverticulum developed secondary to chronic bladder outlet obstruction. A study of 74 cases of bladder diverticulum found that the main aetiology of acquired diverticulum were benign prostate hyperplasia, bladder neck contracture, ureteric stricture and neurogenic bladder. [2] In this study, seven patients (9.4%) also had diverticular stone and eight patients (10.8%) had diverticular tumour. [2] However none of their patients had concurrent stone and malignant growth in the same diverticulum. We report the case of a 53-year-old man who presented with multiple lower urinary tract stone including in the urethra, bladder and bladder diverticulum. Serial investigations before a diagnosis of a bladder diverticulum adenocarcinoma were made. The tumour was hidden behind a stone.

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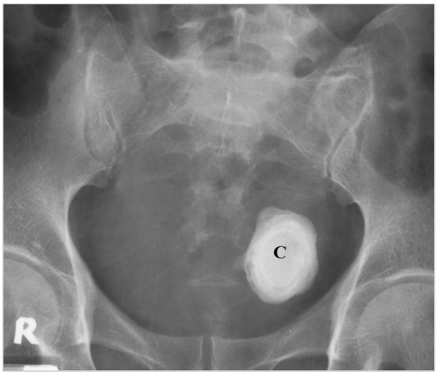
CASE REPORT

A 53-year-old man presented with acute urinary retention for one day duration. Clinical

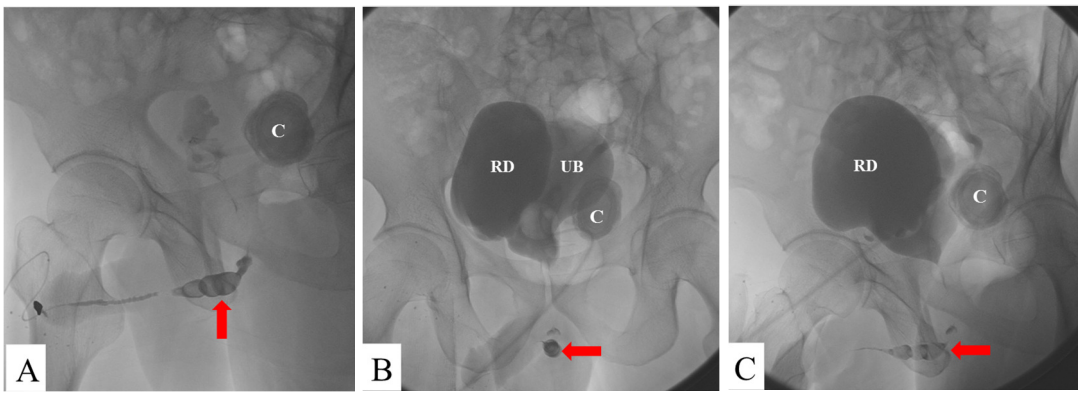
examination showed that the bladder was distended with palpable urethral stone in the penile urethra. The insertion of urinary catheter was attempted in order to push the urethral stone into the bladder and maintained as continuous bladder drainage (CBD). However this failed and suprapubic catheterisation was done.

A kidney, ureter and bladder (KUB) radiograph showed a large extravesical calcification at the left hemipelvis suspicious of intra-diverticular stone (Figure 1). An ascending and descending urethrogram showed a large bladder diverticulum on the right side, with opacity at the left lateral border of urinary bladder suggestive of a large stone within another diverticulum. However, it was not possible to visualise the mucosal lining and opening of the diverticulum. Apart from that, there were multiple urethral stones with long anterior urethral stricture (5 cm) (Figure 2). Supplementary CT scan pelvis was done following urethrogram to further delineate the abnormality which confirmed the presence of large intra-diverticular stone (Figure 3). No contrast was seen within this diverticulum as the stone was large and compressing the diverticular wall, with a small diverticular orifice. Thus, proper evaluation of the diverticular mucosa cannot be done.

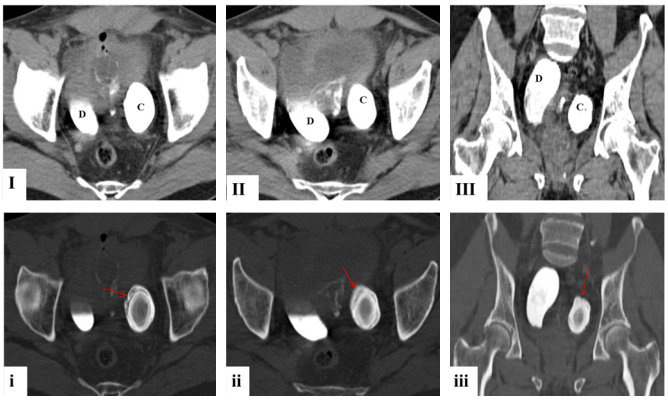


Figs. 1: A plain radiograph showing a large stone (C) at the left hemipelvis.

The patient underwent a cystoscopic examination through the SPC tract and urethral stones were removed. Attempted to tackle the diverticular stone via SPC tract but failed due to the calculus located parallel to the tract. Internal urethrotomy was done and he was put on CBD for two weeks to dilate the urethra. He was able to pass urine normally after CBD was removed. Two weeks later we proceeded with transurethral vesicolithotripsy of the bladder diverticular stone. During the procedure, we noted that the wall of the left diverticulum was lined by irregular mucosal growth (Figure 4). Resection of the abnormal

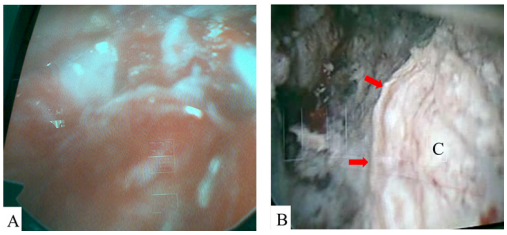


Figs. 2: A-C) Ascending and descending urethrogram showing multiple filling defects within the bulbous part of urethra in keeping with stones (red arrows). A large bladder diverticulum was seen on the right side (RD), and with opacity (C) at the left lateral border of urinary bladder. UB; Urinary bladder.

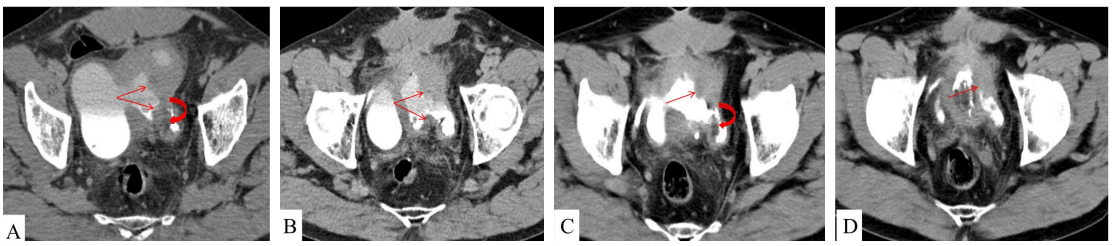


Figs. 3: Computed tomography (CT) scan images showing soft tissue window (I-III) and bone window (i-iii) done immediately after urethrogram (axial and coronal planes) showed a large stone (C, red arrows) occupying the left diverticulum, with residual contrast within the right diverticulum.

growth was done and histology result revealed adenocarcinoma of the bladder diverticulum. Computed tomography cystogram (CT Cystogram) was done to further delineate urinary bladder anatomy prior to diverticulectomy. It showed thickened and irregular bladder wall surrounding the diverticular opening with soft tissue mass at the left diverticular neck, suggestive of residual intra-diverticular tumour (Figs. 5). The patient was planned for radical cystectomy, but defaulted follow up in spite of thorough medical counselling given to him prior to discharge.



Figs. 4: Intraoperative findings showed irregular mucosal growth surrounding the left diverticular opening suspicious of tumor. Transurethral resection of the tumor (TURBT) was performed with removal of the left intra-diverticular stone (C; red arrows) via vesicolithotripsy.



Figs. 5: Axial CT scan images post vesicolithotripsy showing thickened and irregular bladder wall surrounding the diverticular opening (red arrows), with soft tissue mass at the left diverticular neck suggestive of residual intra-diverticular tumour (curve arrows). A-B, Contrast-enhanced CT cystogram and C-D, Post contrast evacuation

DISCUSSION

Malignant changes of urinary bladder diverticulum are rare. It has been reported that only 2.6% of the bladder diverticular are known to undergone malignant changes. [3] Other studies have shown that the incidence of primary intra-diverticular neoplasm varies from 0.8% to 13%. [4, 5] However, cadaveric study showed a higher prevalence rate of malignant changes, 14.3%. [1]

Common types of tumour in the diverticulum include transitional cell carcinoma, squamous cell carcinoma and adenocarcinoma (78%, 17% and 2% respectively). [4] Rare types of malignancy found in the urinary bladder diverticulum have also been reported and

this included combination of squamous and transitional cell carcinoma and small cell carcinoma. [4, 6]

Anatomical differences between normal urinary bladder wall and diverticular wall give different pathophysiology of tumour growth. Lack of muscle fibres in a diverticulum with thin diverticular walls can facilitate early and rapid local tumour invasion. [4] Thus, most of bladder diverticular tumours were found to be advance stage at time of diagnosis. Besides that, the diagnosis can be delayed due to presence of intra-diverticular stone which can compress and hide any evidence of mucosal changes, like in our case. Those factors lead to relatively poor prognosis of diverticular tumour in comparison with bladder tumour. [7] In large series of bladder diverticular tumour by Golijanin *et al.* found that out of 39 cases, 33% had superficial tumour, 33% superficial invasive tumour and 33% were extra-diverticular disease. [5] On follow up they noted 5-year disease specific survival were 83 ± 9%, 67 ± 7% and 45 ± 14% for superficial tumours, superficially invasive tumours and extra diverticular disease respectively. [5]

Traditionally intravenous urography and cystourethroscopy have been used for evaluation of such patients, but computed tomography (CT) and ultrasonography (USG) are increasingly used nowadays in preoperative assessment and diagnosis of bladder diverticular carcinomas. [3] Preoperative CT evaluation helps to delineate the depth and the degree of extension of the primary lesion.[3] Urinary bladder diverticular carcinomas appear as a diffuse or focal thickening of the wall of diverticulum with or without extension into the perivesical region on CT scan imaging. The lesions typically show inhomogeneous enhancement following contrast administration. Another advantage of CT is the ability to evaluate the remaining urinary tract in the same setting. [8] Cystoscopy is used for confirmation of the disease and as a guide for tissue sampling. In majority of cases the tumour can be visualised as papillary or pedunculated lesion during cystoscopy. [8] However, in some cases cystoscopy may fail to disclose a tumour in the diverticulum if the orifice is tight or a small lesion at the base of the diverticulum. [3] Besides that concurrent presentation of diverticular stone will obscure the tumour. Based on literature, concurrent presentation of stone and tumour in the same diverticulum was very rare. Previously reported similar case showed presence of stone in the diverticulum whereas the tumour was occupied the diverticular opening. [9] Thus the tumour was easily recognised on cystoscopy. In contrast, for our case the tumour was not visualised on cystoscopy due to the large diverticular stone that totally obscured it. The lesion can only be identified when the diverticular stone was extracted. Besides that the lesion was also not visualised on earlier CT scan images as the diverticular mucosa was compressed by the large stone; hindering proper assessment of the mucosal lining of the diverticulum. This created management dilemma for us. Open diverticulectomy which will remove both stone and diverticulum in the same setting will be the best option. However, open surgery and breaching the urothelial lining of the bladder may lead to disseminated tumour, especially in case of diverticulum harvested transitional cell carcinoma. Thus, we opted for transurethral surgery as the first step.

The treatment options for intra-

diverticular carcinomas were depend on stage of the tumours. Superficial or superficially invasive diseases were treated either with repeat transurethral resection, or with partial or radical cystectomy. Partial or radical cystectomy was the option for patients with extra diverticular extension. [5] Adjuvant chemotherapy will be given to those with extensive perivesical involvement, but the role of preoperative radiotherapy is controversial. [3]

In conclusion the concurrent presentation of diverticular stone with neoplasms is rare, and gives big challenge to the clinician in formulating the correct diagnosis. Therefore, thorough evaluation of all diverticular stone is necessary to rule out any underlying malignancy as they are the potential source of hidden neoplasm.

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