CASE REPORT

Squamous cell carcinoma of the renal pelvis presenting as sacral bone metastasis

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SUMMARY

We present a rare presentation of squamous cell carcinoma of the kidney with chronic low backache. The diagnosis of this uncommon tumour of the renal pelvis was achieved after incidentally detecting a large staghorn calculus, which on further imaging with contrast-enhanced CT of the abdomen and pelvis was suggestive of the features of renal tumour with sacral bone lesion. The rarity of this metastatic tumour, with its unusual presentation, is discussed.

BACKGROUND

Squamous cell carcinoma (SCC) of the kidney is an uncommon tumour of the renal pelvis. The likely risk factor for SCC is the presence of long-standing staghorn calculi. SCC of the renal pelvis typically presents at an advanced stage with lymphadenopathy. They rarely metastasise to the bones.¹ In the literature, there are only two cases of SCC of the renal pelvis with bony metastasis.^{2 3} We present a case of a patient with SCC of the right kidney with staghorn calculus and with metastasis to the sacral bone. This is only the third case of SCC of the renal pelvis with bone metastasis to be reported in the literature.

CASE PRESENTATION

A 41-year-old woman of Indian origin was evaluated by the department of orthopaedics for chronic low backache and pain in the right gluteal region. Initial evaluation with X-ray lumbosacral spine incidentally detected a right complete staghorn calculus (figure 1). She was referred to the urology department for further management of renal calculus. Physical examination revealed right gluteal tenderness with associated restriction of the right pelvic flexion. Abdominal examination did not reveal any palpable mass, but there was tenderness in the right renal angle.

INVESTIGATIONS

Her renal function was normal. Ultrasound of the kidney, ureter and bladder revealed an irregular mixed echoic mass lesion involving the entire right kidney with a 7×2.5 cm complete staghorn calculus. The opposite kidney and the bladder were normal. She underwent contrast-enhanced CT (CECT) of the abdomen and the pelvis which was reported as a large 5 cm×3 cm staghorn calculus in the right kidney with a heterogeneously enhancing necrotic tumour involving the entire parenchyma of the right kidney, having necrotic lymphadenopathy, vascular,

hepatic, right adrenal, right diaphragmatic infiltration with sacral bony metastasis (figure 2A–D). Bone scan was performed which showed multiple ‘hot’ spots in the right 10th rib, thoracic, lumbar vertebrae and sacrum.

DIFFERENTIAL DIAGNOSIS

We suspected SCC/transitional cell carcinoma of the renal pelvis with sacral bone metastasis.

TREATMENT

A tru-cut biopsy from the sacral lesion revealed metastatic SCC (figure 3A,B). Surgical intervention was deferred due to inoperability of the tumour secondary to encasement of inferior vena cava and aorta with sacral bone metastasis. The patient was treated with three cycles of chemotherapy with cisplatin, gemcitabine and paclitaxel.

Figure 1 X-ray lumbosacral spine anteriorposterior view showing a complete right staghorn renal calculus.

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Figure 2 (A) contrast-enhanced CT (CECT) axial cuts showing a large heterogeneously enhancing necrotic lesion involving the entire parenchyma of the right kidney measuring 9.9×6.6×6.8 cm in size. The lesion is infiltrating the right renal vein, the artery and the infrarenal inferior vena cava (IVC) with the tumour thrombus in the IVC. Superiorly, the lesion is infiltrating the segment VI of liver, right adrenal, right diaphragm and posteriorly into pararenal space extending to the iliac crest. (B) CECT axial cut shows a large well-defined hypodense 3×2.6 cm non-enhancing lesion in the right ala of the sacrum suggestive of metastasis (arrow). (C and D) CECT coronal cuts showing the right renal complete staghorn calculus with tumour (blue arrow) and the sacral bone metastasis (red arrow).

OUTCOME AND FOLLOW-UP

The patient was subsequently on regular treatment and follow-up under the medical oncology department. However, she succumbed to her disease process 2 weeks after the third cycle of the chemotherapy.

DISCUSSION

SCC of the renal pelvis accounts for 0.7–7% of upper urinary tract tumours. SCC of the renal pelvis is usually associated with urolithiasis most commonly staghorn calculi, pyonephrosis, hydronephrosis, pyelonephritis, chronic inflammatory

Figure 3 (A) Fragments of trabecular bone with metastatic tumour (H&E, ×40). (B) Nests of malignant squamous cells with keratin formation (H&E, ×400).

Table 1 Characteristics of the three patients with squamous cell carcinoma of the renal pelvis with bony metastasis

Reference	Age	Sex	Side	Presentation	Renal calculi	Metastasis	Treatment	Survival (months)
Li and Cheung ²	73	F	Left	Scalp swelling	+	Scalp	Open and close	2
Chawla A <i>et al</i> ³	60	M	Right	Pain and restriction of left shoulder movements	+	Left shoulder joint	Right radical nephrectomy and local radiation	6
Our case report	41	F	Right	Low back pain	+	Right sacrum	Chemotherapy	4

conditions like tuberculosis.⁴ This chronic irritation to the urothelium leads to dysplasia, then squamous metaplasia which may subsequently develop into SCC. Women in the age group of 50-70 years are more commonly affected. There are only two cases of SCC of the renal pelvis with bone metastasis reported until date. Our patient had an asymptomatic large staghorn calculus which had progressed to squamous metaplasia and presented as an advanced renal tumour (table 1).⁵

Symptoms usually are attributed to the late presentation of this tumour. They commonly present as haematuria, flank pain and patients with advanced disease may present with a flank mass, malaise, anorexia and features of tumour cachexia. They are associated with paraneoplastic syndromes such as hypercalcaemia, leukocytosis and thrombocytosis. These tumours are usually moderate to poorly differentiated. Grossly, SCC of the renal pelvis is usually bulky, necrotic and ulcerated, and commonly invades the renal parenchyma. Histologically, it resembles SCC in other organs and is composed of atypical keratinising or non-keratinising keratinocytes that infiltrate the stroma in irregular sheets and cords.⁶ Most of them are high-grade tumours and invasive with a stage pT3 or above at the time of presentation. The aggressive nature of this tumour is indicated by the extensive regional spread, lymphadenopathy and metastasis to the lungs, liver and rarely to the bones. This young woman had chronic low backache and bony pain due to metastasis to the sacrum, which could mislead the clinician, if she was not thoroughly evaluated.

CECT abdomen and pelvis is the investigation of choice. Liver function test, chest X-ray, bone scan are performed for metastatic workup. Surgery is the main modality of treatment which includes radical nephrectomy or nephroureterectomy with a suspicion of TCC. Cisplatin-based chemotherapy and palliative radiotherapy have been advocated for the control of local symptoms in metastatic diseases, but have failed to show any survival benefit. The advanced stage at presentation is associated with a

poor prognosis. The 5-year survival rate is less than 10% and the median survival after surgery is around 7 months.⁷

Learning points

- Kidneys with long-standing staghorn calculi are prone to developing dysplastic/anaplastic changes.
- Although uncommon, squamous cell carcinoma of the renal pelvis may present with distant bony metastasis.
- A high index of suspicion is required when dealing with such cases to enable timely intervention.

Contributors All the authors equally contributed in the data collection. ZBMH and SBP compiled the information about the patient along with data collection and contributed in drafting the case report.

Competing interests None.

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