Renal Squamous Cell Carcinoma Presented With Bone Metastasis and Coexistence With Xanthogranulomatous Pyelonephritis: A Case Report

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ABSTRACT
Squamous cell carcinoma (SCC) of the kidney is a rare entity. Coexistence of SCC with xanthogranulomatous pyelonephritis is exceedingly rare with only few reports in the literature. We report a case of a 45-year-old male patient with xanthogranulomatous pyelonephritis coexistence with renal SCC in one kidney, which proved radiologically and histopathologically. The patient presented to the medical care with bone metastasis. Full radiology workup is also provided which includes computed tomography, magnetic resonance imaging, and positron emission tomography-computed tomography.

Case Presentation
A 45-year-old male patient presented to our institute with a history of left hip pain for 6 months and no past medical history of chronic diseases. No history of trauma is provided. The patient also went to a private clinic with the same complain and diagnosed to have osteoarthritis of the left hip joint and treated using nonsteroidal anti-inflammatory drugs. Local examination was performed and was within normal limit apart from minimal tenderness at the region of the left hip joint. General physical examination of the patient revealed a palpable and tender mass located at the left upper quadrant of the abdomen. The rest of examinations were unremarkable. Complete blood count, erythrocyte sedimentation rate, and biochemical analysis were all within normal limits.

Plain radiograph of the pelvis was performed and shows ill-defined lytic bony lesion with wide zone of transition seen in the left femoral neck (Fig. 1). No associated fracture line is seen. No soft tissue component is identified. The appearance of the lesion is aggressive, and the differential diagnosis is wide which include primary or secondary malignancy. The patient was referred to the orthopedic oncology team, and plan was made for bone biopsy for histologic confirmation.

After patient consent, bone biopsy was taken from the previously described lesion by the orthopedic oncology team and the specimen send to the pathology department for histologic analysis. The result of the pathology department was provided and shows poorly differentiated metastatic carcinoma with possible primary such as lungs and kidneys.

Computed tomography (CT) of the chest, abdomen, and pelvis was then requested for further assessment, looking for primary source. The CT shows massively enlarged left kidney. The renal parenchyma is replaced by multiple low attenuating areas associated with thinning of the renal cortex. There is large stag-horne calculus obstructing the renal hilum. Multiple nonobstructing renal stones are also seen. Delayed images were obtained and show no renal excretion. So, the constellations of enlarged and obstructed nonfunctioning kidney with multiple low attenuating masses replacing the renal parenchyma are in keeping with xanthogranulomatous pyelonephritis (Figs. 2 and 3) (XGP).

Focal hyperdense soft tissue mass is identified at the lower pole of the left kidney with central foci of calcification resembling focal thickening of the renal cortex (Figs. 2 and 3).

After that, positron emission tomographic scan was requested for complete patient work up. The positron emission tomography-computed tomography shows enlarged left kidney with extensive hydronephrosis. Multiple hypodense renal masses are seen replacing the renal parenchyma associated with low metabolic activity. The wall of the masses shows fluodeoxyglucose (FDG) avidity. There is focal soft tissue density in the midpole of the left kidney that shows FDG hypermetabolism with standard uptake value of approximately 11.8. Another soft tissue density is
also noted in the lower pole of the left kidney with intense FDG uptake and standard uptake value of approximately 23. Hypermetabolic bone lesions suggestive of metastasis are also seen involving T vertebral body and T2. FDG avid lesions are also seen involving the left humerus, left acetabulum, right acetabulum, left superior pubic rami, and left femoral neck. No hypermetabolic lymphadenopathy in the abdomen or pelvis was observed.

Then, the patient was referred to the urology team for surgical resection. The patient underwent left radical open nephrectomy with lymph node dissection. The pathology specimen was sent to the pathology department for further assessment. Histopathologic examination of the specimen revealed invasive squamous cell carcinoma (SCC) originating from the renal pelvis and extensively infiltrating the renal parenchyma. There is also marked inflammation, which seen in the vicinity of the infiltrating neoplasm and number of CD68-positive cells. The final diagnosis was made to be renal SCC coexistence with xanthogranulomatous pyelonephritis in one kidney with multiple liver and bone metastasis.

Discussion

XGP is an uncommon form of chronic pyelonephritis that occurs as a result of chronic obstruction and subsequent infection. Almost all cases of XGP (90%) are associated with renal calculi. CT is the imaging modality of choice for XGP, as it provides an accurate estimate of the extent of the disease, thus helping in surgical planning.

Diagnosis of XGP is usually made by the presence of an enlarged nonfunctioning kidney with large obstructing staghorn calculus, caliceal dilatation, low attenuation areas replacing the renal parenchyma secondary to inflammatory infiltrate, and perinephric stranding. All the aforementioned features were present on the CT images of our patient, and therefore XGP was the leading consideration.
Primary renal squamous cell carcinoma is a rare cancer with a variable incidence of approximately 0.5%-15% of all urothelial cancers.\textsuperscript{1-4} There are only isolated case reports and scant case series of such cases in the English literature. SCC of the renal pelvis is the second most common malignancy after adenocarcinoma. The etiologic factors which play in the genesis of this rare malignancy are strongly associated with phenacetin consumption, chronic renal calculi, pyelonephritis, and squamous metaplasia.\textsuperscript{3} The kidney is usually nonfunctional because of chronic obstruction. SCC presents as a renal pelvic infiltrative lesion without evidence of a distinct mass. Diagnosis of renal SCC is difficult as characteristic features usually not associated with renal SCC, added by imaging techniques which reveals only calculi and hydronephrosis.\textsuperscript{1,3} Therefore, initial diagnosis of SCC is mostly based on histologic analysis as was seen in the present case.\textsuperscript{4}

Lee et al\textsuperscript{5} in their study classified these tumors into 2 groups, according to localization of the tumors as central and peripheral. Central renal cell carcinoma presents more intraluminal components and is usually associated with lymph node metastasis, whereas peripheral renal SCC presents with prominent renal parenchymal thickening and might invade the perirenal fat tissue before lymph node or distant metastasis could be identified.

**Conclusion**

XGP is a risk factor for malignancy because of chronic irritation by the presence of stones and associated chronic infection. Although it is a rare entity, coexistence of malignancy such as SCC should be considered.

**Conflict of interest**

No conflict of interest in writing this article.

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