Buletin Kedokteran & Kesehatan Prima
Vol.4 No.1 (2025)
DOI: 10.34012/bkkp.v4i1.6540

CASE REPORT

Squamous cell carcinoma of the kidney: A case report

Juliana Lina[1]*, Reh Malem br Karo[2], Yohani Theresia[3], Qori Fadillah[3]

ABSTRACT

Primary renal squamous cell carcinoma (SCC) is a rare neoplasm strongly associated with a history of nephrolithiasis. Renal SCC is reported to have high morbidity and mortality rates, especially in the elderly population. Clinical manifestations of renal SCC are generally characterized by hematuria, flank pain, and a palpable mass in the retroperitoneal area. Histopathological examination reveals the infiltration of squamous cell nests that destroy the stroma. These cells show nuclear pleomorphism, an increased nuclear/cytoplasmic ratio, irregular nuclear membranes, coarse chromatin, prominent and dense basophilic nucleoli, and eosinophilic cytoplasm. These histopathological findings confirm the diagnosis of squamous cell carcinoma. The uniqueness of this case lies in the diagnosis of renal SCC in a relatively young age group, making it a distinct clinical concern. Further immunohistochemical examination, including CK5/6, p63, p40, and CK14 panels, is needed to determine the prognosis and appropriate treatment strategy. This case report emphasizes the importance of understanding kidney stone disease as a preventive measure against the development of renal SCC.

Keywords: squamous cell carcinoma, nephrolithiasis, hematuria, elderly

Introduction

Squamous cell carcinoma (SCC) of the kidney is a rare and aggressive neoplasm, accounting for less than 1% of all malignant renal tumors. It is often diagnosed at an advanced stage due to the gradual onset of vague symptoms, lack of specific clinical or radiological features, and inconclusive radiological features1. These factors contribute to delayed diagnosis and treatment.[1] SCC of the kidney is associated with chronic irritation of the urothelium, often linked to conditions such as renal calculi, radiotherapy, and infections.[1–3] The disease is more frequently observed in males. A retrospective analysis of 14 patients who underwent surgery for renal cancers between 2015 and 2021 revealed that most patients with SCC of the kidney were male (71.4%), with a mean age of 56 years. Flank pain was the most common presenting symptom (78.6%), followed by fever (42.9%).[1] Due to its rarity and non-specific presentation, SCC of the kidney is often discovered incidentally during histopathological examination after nephrectomy. The mean overall survival for patients with SCC of the kidney is approximately 5 months. A high index of suspicion is warranted in patients with chronic kidney stone disease.[1,4]

Affiliation
[1]Department of Anatomic Pathology, Universitas Prima Indonesia, Medan, Indonesia
[2]Clinical Pharmacy Programme, Universitas Prima Indonesia, Medan, Indonesia
[3]Department of Anatomy, Universitas Prima Indonesia, Medan, Indonesia

*Korespondensi:
rehmalembrkaro@gmail.com

Case Report

A 49-year-old male presented with a history of right flank pain and hematuria (blood in urine) over the past few months. He had a prior history of kidney stones. Physical examination revealed right flank tenderness, and abdominal ultrasonography identified a right kidney stone and severe hydronephrosis (swelling of the kidney due to a blockage). Based on these clinical and radiological findings, right renal squamous cell carcinoma was suspected, and a right nephrectomy (surgical removal of the kidney) was performed for histopathological examination.

Macroscopic description

The specimen received was a right nephrectomy, consisting of a single, bisected kidney fragment weighing 603 grams and displaying an irregular surface. A gray-yellow tumor was observed, with overall tissue dimensions of 13 x 9 x 8 cm. The tumor mass was firm to the touch. Upon sectioning, the tumor mass exhibited an irregular shape, measuring 11 x 6 x 5 cm, and a friable (easily crumbled) consistency. Several small cysts with smooth inner walls were also found.

Microscopic description

Microscopic examination of the kidney tissue sections revealed nests of infiltrating squamous cells, lacking an epithelial lining and displaying destructive stromal invasion. The tumor cells exhibited nuclear pleomorphism (variation in cell size and shape), an increased nuclear-to-cytoplasmic ratio, irregular nuclear membranes, coarse chromatin, prominent, dense basophilic nucleoli (structures within the nucleus), and eosinophilic cytoplasm (staining pink with eosin dye). Blood vessels showed luminal dilation, congestion, interstitial hemorrhage, and extensive necrosis (tissue death). The stroma consisted of fibrous connective tissue and a dense infiltrate of lymphoplasmacytic inflammatory cells and histiocytes (immune cells). No lymphovascular or perineural invasion was observed. Examination of the pararenal fat tissue section (containing a single lymph node) revealed lymphoid tissue surrounded by fibrous and adipose tissue. Lymphoid follicles were apparent, with proliferating germinal centers and infiltrating histiocytes; tumor cells were observed in this lymph node section.

Diagnosis and additional findings

Diagnosis:
Squamous cell carcinoma, Not Otherwise Specified (NOS).

Additional findings:

- Tumor-Infiltrating Lymphocytes (TILs): Heavy (>50%)
- Lymphatic Vascular Invasion (LVI): Negative
- Perineural Invasion: Negative
- Pararenal Lymph Node (single): Metastasis of squamous cell carcinoma identified.

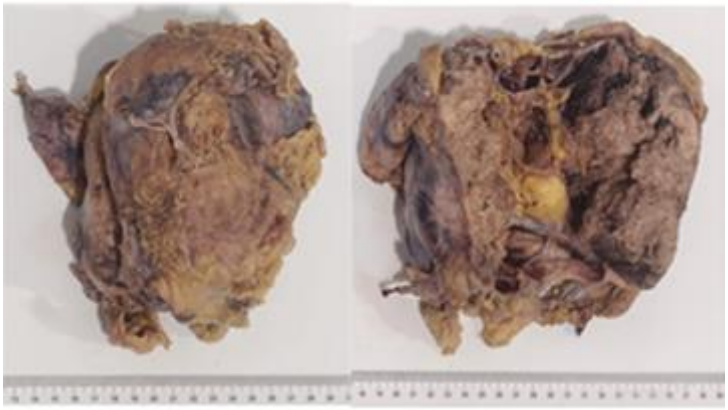

Figure 1. Macroscopic preparation

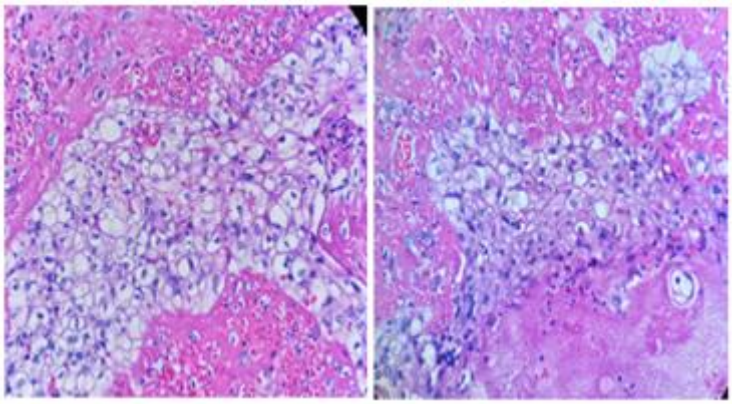

Figure 2. Microscopic preparation

Discussion

Renal squamous cell carcinoma (SCC) is a rare kidney malignancy, accounting for less than 1% of all renal malignancies. Its nonspecific clinical and radiological features often delay diagnosis, leading to a poor prognosis because of the advanced stage at presentation.[5–8] A history of kidney stones, radiotherapy, analgesic abuse, infection, and other factors that chronically irritate the bladder mucosa can damage the epithelial cells lining the bladder mucosa, potentially leading to dysplasia and carcinoma. Severe kidney damage and incidental findings on radiological examination can be the initial indications of renal SCC.[9,10]

Squamous cell carcinoma is predominantly found in elderly men and presents with clinical symptoms including pelvic pain, hematuria, fever, anorexia, a palpable flank mass, and weight loss. Because these symptoms are also present in other types of renal malignancy, the diagnosis and treatment of squamous cell carcinoma is difficult.[7,9,10]

Thorough and accurate examination for the management of patients with squamous cell carcinoma remains challenging for clinicians because of the poor prognosis associated with this malignancy. Examination guidelines are needed to diagnose squamous cell carcinoma as early as possible, especially in individuals with risk factors. Because data and reports on renal squamous cell carcinoma cases are limited, diagnosis can be difficult to establish clinically. However, the diagnosis can be definitively established by identifying squamous cell differentiation in the microscopic features of the tumor mass.[1,11,12]

Surgery (radical nephrectomy or nephroureterectomy) is the primary treatment for squamous cell carcinoma. Postoperative chemotherapy and/or radiotherapy do not significantly improve survival, because patients usually present at an advanced stage. The relatively rapid recurrence of the tumor worsens the overall survival of patients with squamous cell carcinoma compared to those with other renal malignancies.[13–15]

Conclusion

This case report describes a 49-year-old male who presented with symptoms initially suggestive of kidney stones but received a final diagnosis of a rare and aggressive renal squamous cell carcinoma (SCC). Although the initial clinical picture suggested a benign condition, further investigation and histopathological examination following nephrectomy revealed advanced SCC with lymph node metastasis. This case highlights the diagnostic challenges of renal SCC, which often mimics common renal conditions due to its non-specific presentation. It underscores the importance of considering rare malignancies in the differential diagnosis of persistent urological symptoms to facilitate timely diagnosis and management. However, the prognosis often remains poor due to the advanced stage at presentation typical of this disease.

References

1. Shah SAS, Mahar NA, Qureshi HH, Hussain M, Sultan G, Mohsin R, et al. Squamous Cell Carcinoma of the Kidney: A Large Case Series. Oncology. 2023 Jun 14;37(6):246–9.
2. Stamatiou. Squamous Cell Carcinoma of the Urinary Bladder: A Clinicopathological Study of Four Cases and a Review of the Literature. World J Nephrol Urol. 2014;3(1):58–62.
3. Liang K, Yuan Y, Lv B, Ke Z. Primary squamous cell carcinoma of renal parenchyma: A case report and literature review. Front Oncol. 2023 Mar 30;13.

4. Coban G, Tekden BC, Şahin N, Toluk Ö, Toprak H, Yıldız P, et al. Unexpected Discoveries: Uncovering Incidental Tumors in Simple Nephrectomy Specimens. Rev Médica Clínica Las Condes. 2023 Nov;34(6):421–6.
5. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021 May 4;71(3):209–49.
6. Flaig TW, Spiess PE, Agarwal N, Bangs R, Boorjian SA, Buyyounouski MK, et al. Bladder Cancer, Version 3.2020, NCCN Clinical Practice Guidelines in Oncology. J Natl Compr Cancer Netw. 2020 Mar;18(3):329–54.
7. Kamat AM, Hahn NM, Efstathiou JA, Lerner SP, Malmström PU, Choi W, et al. Bladder cancer. Lancet. 2016 Dec;388(10061):2796–810.
8. Santoni G, Morelli MB, Amantini C, Battelli N. Urinary Markers in Bladder Cancer: An Update. Front Oncol. 2018 Sep 7;8.
9. Ghandour R, Singla N, Lotan Y. Treatment Options and Outcomes in Nonmetastatic Muscle Invasive Bladder Cancer. Trends in Cancer. 2019 Jul;5(7):426–39.
10. Cheng S, Jiang Z, Xiao J, Guo H, Wang Z, Wang Y. The prognostic value of six survival-related genes in bladder cancer. Cell Death Discov. 2020 Jul 13;6(1):58.
11. Sahoo TK, Das SK, Mishra C, Dhal I, Nayak R, Ali I, et al. Squamous Cell Carcinoma of Kidney and Its Prognosis: A Case Report and Review of the Literature. Case Rep Urol. 2015;2015:1–3.
12. Nachiappan M. Squamous Cell Carcinoma of the Renal Pelvis, A Rare Site for a Commonly Known Malignancy. J Clin Diagnostic Res. 2016;10(1).
13. Brits NF, Bulane S, Wadee R. Primary squamous cell carcinoma of the kidney: a case report and review of the literature. African J Urol. 2020 Dec 3;26(1):79.
14. Salehipour M, Dastgheib N, Hosseinzadeh M, Makarem A, Rezvani A, Sanati A, et al. Primary renal pelvis and ureter squamous cell carcinoma (SCC): a rare case report and review of literature. Int Med Case Rep J. 2019 Jun;12:189–92.
15. Jiang P, Wang C, Chen S, Li J, Xiang J, Xie L. Primary renal squamous cell carcinoma mimicking the renal cyst: a case report and review of the recent literature. BMC Urol. 2015 Dec 23;15(1):69.