
MUCINOUS TUBULAR AND SPINDLE CELL CARCINOMA OF THE KIDNEY: A CASE REPORT OF A RARE TUMOR

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ABSTRACT

The objective of this research is to enhance the understanding and recognition of Mucinous Tubular and Spindle Cell Carcinoma of the Kidney (MTSCC-K), a rare renal tumor occurring in less than 1% of all renal tumors. The focus is on improving clinical diagnosis, understanding the tumor's characteristics, and exploring the prognosis and implications for patients. The method used in this research is a case study. The results of this research indicate that Clinical Presentation: MTSCC-K predominantly occurs in women and often presents with flank pain, similar to other renal tumors. However, it may lack other typical symptoms such as significant weight loss or urinary problems. Imaging Characteristics: CT scans may reveal solid masses with patchy calcification, often protruding outside the renal contour. These specific imaging features can aid in the differential diagnosis of MTSCC-K Histopathological Features: MTSCC-K is characterized by small, elongated cords or tubules arranged densely, with interspersed myxoid stroma. The presence of slender tubular spindle cell-like structures is a distinctive feature Prognosis: Patients with MTSCC-K, especially when diagnosed early and treated with radical nephrectomy, have a comparatively good prognosis compared to other renal cell carcinomas. The lack of identified metastases in the presented case also supports a positive prognosis. Implications of this research include: Increased awareness among doctors and radiologists about the unique clinical and imaging features of MTSCC-K can lead to faster and more accurate diagnoses. Continued research into the genetic and molecular aspects of MTSCC-K can pave the way for personalized therapies, enhancing the overall management of this rare kidney tumor.

Keywords: mucinous tubular, spindle cell carcinoma, renal, computed tomography, magnetic resonance imaging, radical nephrectomy.

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INTRODUCTION

Mucinous tubular and spindle cell carcinoma of the kidney (MTSCC-K) is a rare tumour newly added to the World Health Organization (WHO) classification in 2004 (Bajpai et al., 2022). It is believed to be a low-grade malignant tumour with a good prognosis (Gong et al., 2020). The origin of MTSCC-K is still unclear and hypothesized to be either the loop of Henle or the collecting duct (Gong et al., 2020). MTSCC-K has a wide range of age distribution (from 13 to 82 years old) and a female predilection, sometimes found accidentally and asymptomatic (Sun et al., 2014). The most common complaints are gross hematuria, flank pain, and lumbar mass, depending on the size of the tumour (Alves et al., 2021). Herein, we reported coincidentally finding a patient with acute flank pain without any urinary problems and found a tumour from an imaging examination.

Case

A 67-year-old woman presented with right flank pain without gross hematuria and fever for a month. The Renal function test results were expected without a history of stone disease. The

abdominal computed tomography (CT) imaging examination revealed a 7,2x7x 5,4 cm well-circumscribed solid mass with patchy calcification in the central area and protruding outside the renal contour in the medial-lower pole of the right kidney. The contrast injection slightly enhanced the lesion at the arterial and venous phases. The tumour part in the renal was less enhanced than normal renal parenchyma (**Figure 1**).

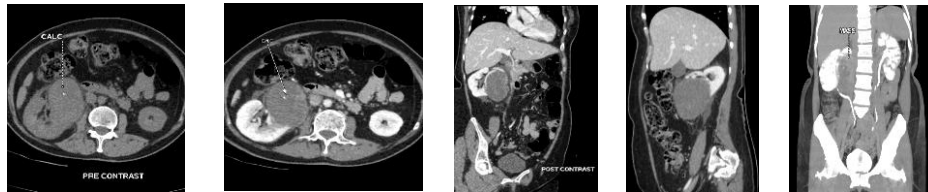


Figure 1. (A) Plain CT images show a solid mass, well-defined margins with patchy calcification in the central area and protruding outside the renal contour in the medial-lower pole of the right kidney. (B-E) Contrast-enhanced CT images show that the tumour part located in the renal was less enhanced compared with normal renal parenchyma.

The imaging examination by abdominal MRI revealed a well-circumscribed solid mass with patchy calcification in the mid to lower pole of the right kidney. On Diffusion Weighted Imaging (DWI), there is an increase in signal intensity. The T2-weighted MR image demonstrates the T2-hypointensity of the mass (**Figure 2**).

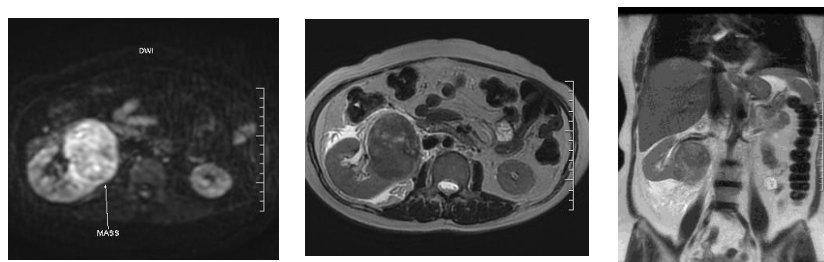


Figure 2. It revealed a solid mass with well-defined margins and calcification in the right kidney's mid to lower pole (A). On Diffusion Weighted Imaging (DWI), there is an increase in signal intensity. (B, C) Axial & coronal T2-weighted MR image demonstrates T2-hypointensity of the mass.

No metastases were identified to the retroperitoneal lymph node, abdominal organs or lungs. The patient underwent radical nephrectomy resection of the right renal. No postoperative therapy was given to the patient. The patient was planned for control 6 months later.

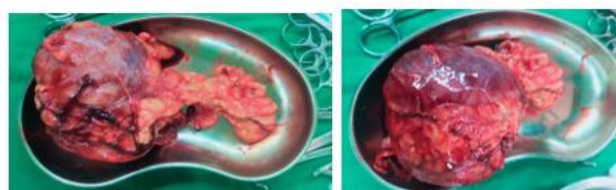


Figure 3. The gross specimen of the nephrectomy showed a renal mass

Macroscopy: The suitable radical nephrectomy specimen was 12 x 10,5 x 7 cm and weighed 524 g. The cut section revealed a tumour occupying the lower pole of the right renal. It was a greyish-white, partly brownish in appearance, measuring 7 x 6 x 6 cm (**Figure 3**)

Microscopy: The dominant tumour growth is arranged to form tubules that anastomose with each other between amorphous materials consisting of proliferation of anaplastic epithelial cells with rounded oval nuclei, mild pleomorphic, coarse chromatin, and ample cytoplasm. Areas of necrosis and bleeding were identified. The tumour grows invasively into the renal parenchyma without lymphangio or perineural invasion (**Figure 4**).

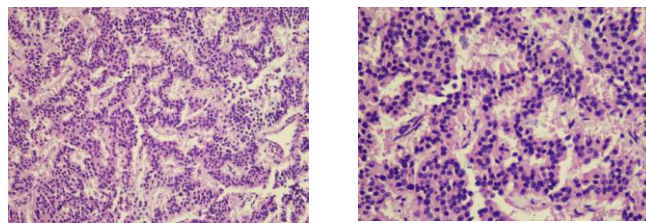


Figure 4. Microscopical photographs of the tumour. Microscopical photographs of the tumour stained by hematoxylin and eosin staining. (a) 200× magnification of haematoxylin and eosin stained section of renal tumour. (b) 400x magnification of haematoxylin and eosin stained section of renal tumour.

The urgency of this research lies in the rarity of Mucinous Tubular and Spindle Cell Carcinoma of the Kidney (MTSCC-K), occurring in less than 1% of all renal tumors. Given its low incidence and the need for specific diagnostic and treatment strategies, urgent research is essential to improve the understanding of this condition. Early diagnosis and targeted treatment can significantly impact patient outcomes, making timely research crucial. This research is novel due to the scarcity of data on MTSCC-K. The unique combination of clinical, imaging, and histopathological features associated with this tumor presents an opportunity to contribute new knowledge to the field of oncology. The detailed examination of its characteristics, prognosis, and treatment outcomes adds to the limited existing literature, making this research highly innovative and valuable.

The aim of this research is to develop accurate diagnostic criteria based on clinical presentation, imaging characteristics, and histopathological findings, enabling the precise and early identification of MTSCC-K. Additionally, the study aims to assess the psychosocial impact of MTSCC-K on patients and develop supportive strategies that enhance their quality of life during and after treatment. Therefore, the benefits of this research include early detection and treatment, reducing diagnostic errors, and enhancing medical knowledge. This study contributes to a broader understanding of rare kidney tumors, paving the way for further research and potentially influencing the direction of oncological research in the future.

METHOD

The research method used in this study is a case study. The data collection techniques employed in this research include patient medical records, imaging data, and pathological specimens.

RESULTS AND DISCUSSION

MTSCC is a rare variant called low-grade collecting duct carcinoma or grouped under renal cell carcinoma (RCC) (Ramya et al., 2022). This tumor occurs less than 1% of all kidney tumors. It mainly affects adults, typically occurring around the age of 58, although it can occur in individuals as young as 13 or as old as 81. Mucinous tubular and spindle cell carcinoma is more common in females, with a ratio of 3 females to 1 male (Ramya et al., 2022).

Most patients usually present with asymptomatic masses and are often found incidentally by abdominal imaging for unrelated reasons (Nathany & Monappa, 2020). Some cases might manifest with symptoms like hematuria, pain in the side, and a noticeable lump in the abdomen (Nathany & Monappa, 2020). Typically, the tumor is located in the outer layer of the kidney (renal cortex), and exceptionally rarely, it might develop in the inner region (renal medulla) as well (Moch et al., 2016).

This is in line with our patient, who had no other symptoms besides flank pain, and a tumour was accidentally found during a lumbosacral MRI. Therefore, in most cases found with no apparent symptoms, diagnosis of MTSCC-K mainly depends on pathological analysis (Wu et al., 2013). In our histological findings, dominant tumours are arranged from tubules that anastomose with each other between amorphous materials, supporting a picture of MTSCC (Ferro, 2013).

Overall, MTSCC-K shows a lower rate of malignancy and a better prognosis than other RCC types (Ozturk, 2015). Currently, surgical resection is recognized as the mainstay of treatment. Since these tumors are typically low in grade, they tend to respond well to either partial or radical nephrectomy. In general, radical nephrectomy is the best treatment and no additional treatment after surgery (Nathany & Monappa, 2020). Some cases reported in the literature have shown recurrence, regional lymph node metastases, and distant metastases (Kenney et al., 2015). These occurrences are associated with lesions displaying high nuclear grade, sarcomatoid transformation, and other abnormal histomorphologic characteristics ((Thway et al., 2012). This is in line with our patients who did not find any metastases, and we performed nephrectomy to minimize the chance of recurrence (Mouracade et al., 2017).

Extremely rare for MTSCC-K to have metastases to lymph nodes and other organs at the time of diagnosis because of its low pathological stage (Ursani et al., 2011). However, MTSCC-K, a type of renal cancer, requires close follow-up after surgery (Kato et al., 2009). Follow-up and clinical evaluation are needed 6 months after surgery, with imaging evaluation one year subsequently if there is no complaint. Therefore, it is essential to maintain careful monitoring even after a thorough excision, even though the tumor typically follows a benign clinical course.

CONCLUSION

MTSCC-K is a malignant tumour classified as low-grade epithelial, and some cases do not show significant complaints, as in the case above. Although classified as low grade, MTSCC can recur and metastasize. Surgical and clean margins are considered a standard localized renal cell carcinoma treatment. So, high accuracy is expected in making a diagnosis so that patients get the proper treatment. It is also important to follow-up and clinical evaluation 6 months after surgery.

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