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Rare presentation of a clear cell renal cell cancer metastasis to the contralateral testicle: A case report

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A B S T R A C T

Renal cell carcinoma metastases to the testes are a rare occurrence, with less than 50 described in the literature. We describe a man who presented with a metastasis in his contralateral testicle five years after nephrectomy for clear cell renal cell carcinoma, as well as a review of the available literature. This case highlights the diagnostic challenges associated with this presentation.

1. Introduction

Renal cell carcinoma (RCC) accounts for 3% of all cancers, and incidence is increasing at a rate of 2% per year.[1] Clear cell RCC (ccRCC) is the most common of all solid renal tumours.[1] Between 35 and 40% of patients have metastases on presentation, whilst 20–40% will develop metastases following surgical resection of their primary RCC. RCC typically metastases via the venous system, with the most common sites of metastasis the lungs, brain, bone and liver, however, atypical sites have been reported.[2,3] We present a rare case of metastasis to the contralateral testis over five years following surgical resection of the primary tumour.

2. Case presentation

An 80-year-old man was referred by his GP for ultrasound for investigation of a right sided hydrocoele. Scrotal ultrasound demonstrated a 10.8 × 10.2 × 10mm homogenous, echogenic, hypervascular intratesticular mass in the left testis (Fig. 1). The right testis had no intraparenchymal lesion, however a small varicocoele and hydrocoele was noted. He was referred to a urologist, and upon scrotal examination found that the mass was palpable. His past medical history included right nephrectomy five years prior for pT1a Fuhrman grade II ccRCC, bilateral sub-centimeter lung nodules which were under surveillance and insulin-dependent diabetes mellitus. Testicular tumour markers were negative (bHCG <1IU/L; AFP <2 μg/L and LDH 164 U/L).

He underwent left-sided radical inguinal orchidectomy. Histology revealed a 15mm tumour composing of large polygonal epitheloid cells with abundant optically-clear cytoplasm and prominent cytoplasmic membranes. The nuclei were small, irregular and possessed vesicular chromatin. The tumour had broad pushing borders, delicate fibrous septa, and an arborizing capillary vascular network. Immunohistochemistry demonstrated moderately strong diffuse positivity for CAIX, weak focal positivity for PAX8 and negativity for OCT4 (Fig. 2). These findings confirmed metastatic ccRCC.

The patient was reviewed by the medical oncology team, and is currently undergoing watchful waiting.

3. Discussion

This is a rare presentation of ccRCC metastasis to the contralateral testis. RCC typically metastasises to the lymph nodes, lungs, bones, liver and brain. It is rare for solid tumours to metastasise to the testicles, with the majority from prostate tumour, lung tumours and malignant melanomas.[3] This is thought to be due to the lower temperature in the testes, and the blood-testis barrier created by Sertoli cells, which create a less favourable environment for malignant cells to proliferate.[2,3]

To date just under 50 cases of RCC metastases to the testicles have been described in the literature. The most common presenting complaint is testicular enlargement, pain or palpable mass.[2] The lesion was present in the left testicle in 22 of 47 cases, and was bilateral in just two. It was contralateral in 14 of 44 cases. In 29% (8 of 27) of cases, it was the only site of metastatic disease.[2] The majority presented after treatment of the primary lesion.

Several different mechanisms for spread have been postulated, most frequently venous backflow along the gonadal vein. Whilst this is

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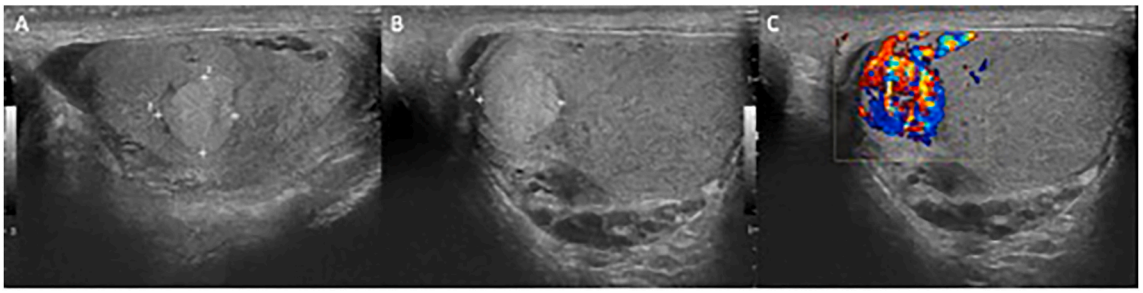

Fig. 1. Ultrasound images of the left testicle. A (longitudinal) and B (axial) views demonstrating an intra-testicular, homogenous, hypoechogenic lesion. C axial colour Doppler view demonstrating internal vascularity of the lesion. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

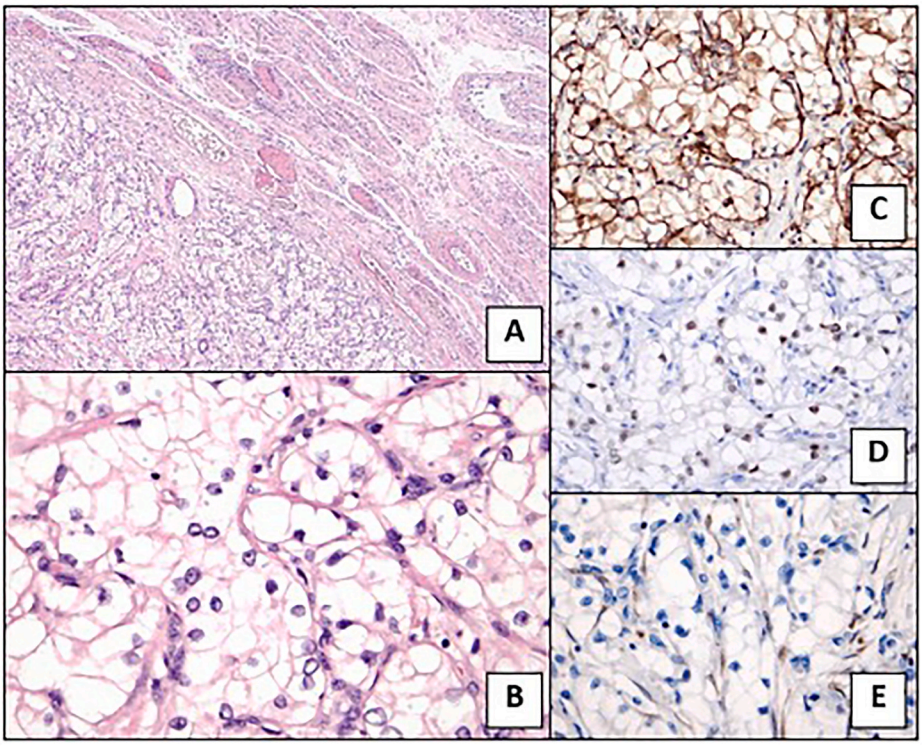

Fig. 2. Micrographs: A) low power view (x40 magnification) of tumour (bottom left) with broad pushing border and background testis parenchyma (top right), H&E stain; B) high power view (x400 magnification) of tumour, H&E stain; C) medium power view (x200 magnification) showing moderately strong diffuse positivity for CAIX, IHC stain; D) medium power view showing weak focal positivity for PA×8, IHC stain; E) high power view showing negativity for OCT4, IHC stain.

possible for tumours on the ipsilateral side, it is less likely in presentations to the contralateral testicle, as was the case for our patient. In presentations to the contralateral testicle, haematological spread is favoured.[2]

The main differential diagnosis for our presentation was primary testicular tumour. However, primary testicular tumours are less common with increasing age, with just 8% of primary testicular tumours occurring over the age of 50.[3] Given testicular tumour markers were negative, which does not rule out primary malignancy, and ultrasound features of testicular malignancies are too general to provide definitive diagnosis, histopathological diagnostic assessment is essential.

Whilst seminoma may also present with clear cytoplasm and prominent cytoplasmic membranes, this case had several atypical features including: abundant cleared cytoplasm, small nuclei, vesicular chromatin and prominent arborizing capillaries. Furthermore, other features of seminoma, such as admixed lymphocytic infiltrate and intratubular germ cell neoplasia, were not present.

For oligometastatic disease that develops after nephrectomy, metastectomy is the preferred form of treatment, and offers a potential source of cure. Systemic therapy is recommended for high volume metastatic disease and can be guided by the patient's risk category, as described by the International Metastatic Renal Cell Carcinoma Database Consortium Criteria (IMDC).[1] Asymptomatic patients should be considered for active surveillance, given the toxicity of systemic therapy. For those judged suitable to undergo systemic therapy, Immune Checkpoint Inhibitors and Tyrosine Kinase Inhibitors are now first line therapy.[1,4]

Given its rarity, there is no specific management of ccRCC metastases to the testicle. Almost all patients have undergone a radical inguinal orchidectomy as a theragnostic procedure, with just one patient receiving a partial orchidectomy. The majority of patients who had multiple other sites of metastases were commenced on systemic therapy.[2]

4. Conclusion

This is a rare presentation of metastatic ccRCC to the contralateral testicle. This case highlights the importance of taking into consideration previous malignancy when considering a new testicular growth or lesion, as well as working closely with anatomical pathologists to confirm the correct diagnosis.

Consent

Informed consent was obtained from the patient.

Declaration of competing interest

The authors have no conflict of interest to declare.

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