Exposition of a renal cell carcinoma (RCC) with an associated pelvic mass on ultrasound

Introduction:

Renal cell carcinoma (RCC) is the most common type of adult kidney cancer, accounting for 90% of cases[1]. Common metastases include ovarian and pelvic tumours. Prognosis largely depends on the stage of the cancer upon discovery, with survival rates decreasing significantly if the cancer has metastasised[2], highlighting the importance of early diagnosis; which ultrasound (US) is an acknowledged part.

Case:

A 65-year old female presented to her general practitioner (GP) with left leg swelling and tenderness. She suffered groin discomfort, correlating with raised left thigh vessels. A duplex ultrasound (US) assessment of the left lower limb was requested to exclude deep vein thrombosis (DVT), which proved negative. An abdominal scan was then performed, as per local protocol. This patient had no family history of cancer and is in general good health. Below, this case addresses the role of US in diagnosis, through to the role of US after diagnosis and implications for future practice.

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Patient attends GP with aforementioned symptoms. DVT scan (Duplex US) performed which is negative on two occasions. Referred for abdominal US.

ABDOMINAL US

Within the mid-upper pole of left kidney, a 36mm heterogeneous mass was identified. B-mode ultrasound used initially, with doppler US demonstrating internal vascularity. Comparison with a 2014 ultrasound assessment established previous normal appearances of this kidney.

CT confirmed suspicion of RCC.

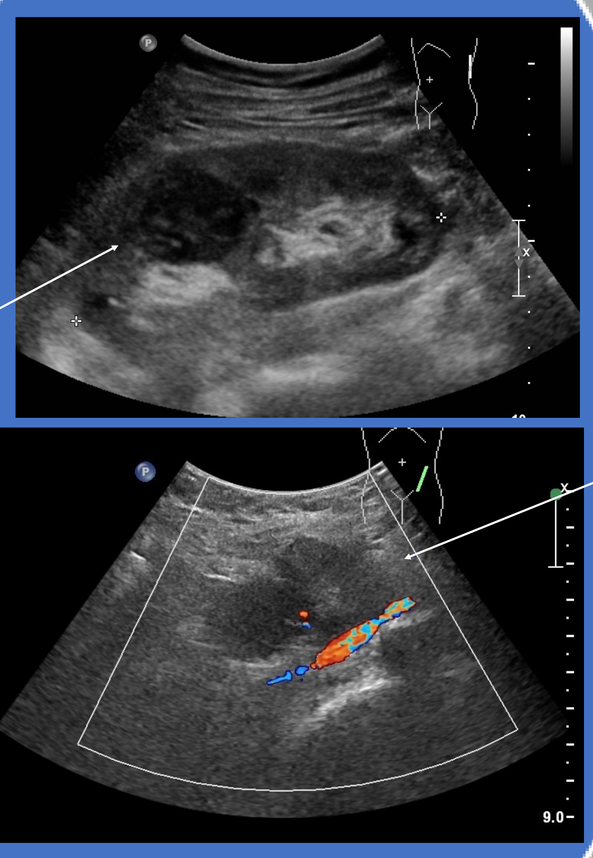
FINDING AN RCC - what to do?

1. Assess using B-mode—echogenicity and location; is this a pseudo-tumour or genuine mass?[3]
2. Colour/power doppler for mass effect and internal vascularity[4].
3. Check for tumour thrombus in IVC and renal vein[4]. Thrombus suggests advanced stage and difficult surgery[5].
4. Check adnexa for pelvic mass, as literature suggest high risk for metastases[6].

What role does ultrasound play next?

1. CEUS for characterisation (benign or malignant differentiation)[7].
2. Elastography - further characterisation for patients unable to have a biopsy or contrast (e.g. renal impairment patients)[8].
3. Fusion imaging guided biopsy[9].

This patient to date has had no follow-up.



ADNEXAL US

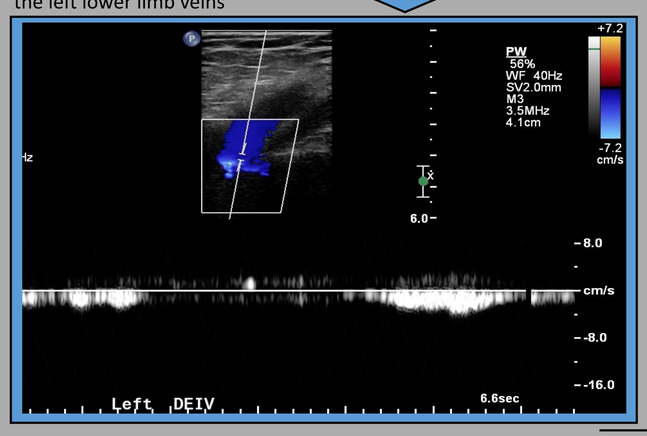
The patient also complained of an adnexal swelling. US imaging in the left adnexa revealed a 64mm irregular, mixed echogenic mass.

CT concurred with US; suggesting RCC in the kidney with metastatic spread to a pelvic mass. CT also determined psoas muscle infiltration, connecting to the pelvic mass, thus constricting the left iliac vessel bundle.

Was earlier detection possible with US?

- **DVT scan negative—however spectral doppler demonstrated reduced velocities in the external iliac vein.**
- **No known literature evaluating venous flow velocities and likelihood of pelvic mass.**
- **Lower limb swelling and a negative DVT correctly followed by an abdominal US.**

Duplex ultrasound assessment of the left lower limb veins



Low velocity flow rate—suggestive of proximal mass?

CONCLUSION

US arguably has the largest role to play in the diagnosis of this RCC. Its initial diagnostic value is huge, owing to being the first imaging modality. Additionally, recent developments such as CEUS, elastography and fusion imaging make it difficult to perceive a more complete modality for RCC assessment. Future practice should aim to utilise spectral doppler of the iliac veins to assess for pelvic mass presence and vessel compression.

Should vascular sonographers have a basic awareness of normal flow velocities, and could this have helped an earlier diagnosis?

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