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Target in sight: CEUS pinpoints metastatic prostate cancer before the biopsy speaks

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Description

A 94-year-old male with a history of benign prostatic hyperplasia, treated with transurethral resection of the prostate (TURP) five years ago, presented with acute left pelvic pain and inability to walk. Clinical suspicion include possible bone metastasis. The patient's reduced renal function significantly restricted the use of contrast-enhanced imaging modalities.

Initial imaging approach

CT scan of the abdomen and pelvis revealed an ill-defined lytic lesion in the supra-acetabular region of the left ilium, associated with cortical destruction and a pathological fracture, highly suggestive of metastatic disease (Figure 1).

Conventional ultrasound identified a heterogeneous lesion near the left iliac bone (Figure 2). Due to patient's condition and contraindications to MRI/CT contrast, contrast-enhanced ultrasound (CEUS) was selected for further evaluation.

CEUS procedure and findings

Contrast-enhanced ultrasound was performed using a microbubble-based agent (Figure 3). A 2.4 mL dose of sulphur hexafluoride microbubbles (8 µL/mL concentration; SonoVue, Bracco, Italy) was injected as a bolus through a catheter placed in the cubital vein, immediately followed by a 10 mL saline flush.

The lesion exhibited brisk arterial phase enhancement and prompt washout, a pattern typically indicative of malignancy. These vascular features strongly pointed toward metastatic disease.

Biopsy under CEUS guidance

Real-time CEUS allowed accurate needle guidance to the viable, hyper enhancing portion of the lesion. On performing the procedure there was no doubt this was osseous in origin from the 'feel' at the end of the needle tip. Tissue sampling was completed without complication (Figure 4).

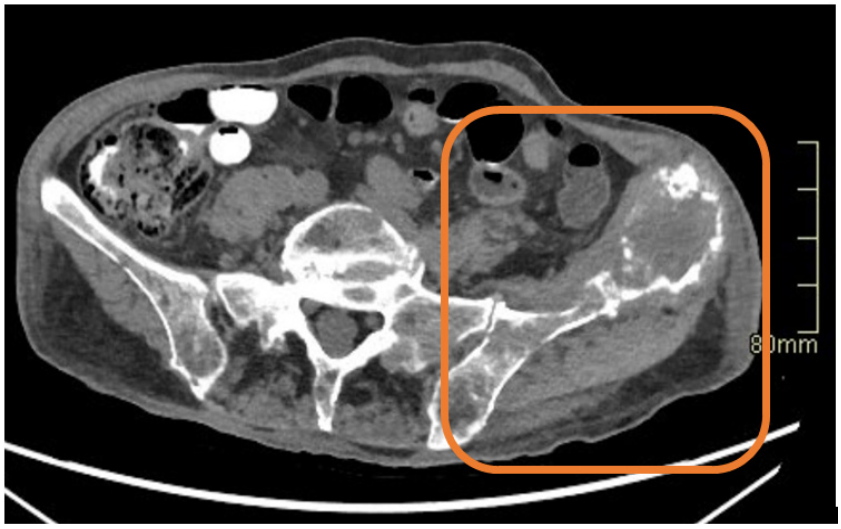

Figure 1: CT scan of the abdomen and pelvis.

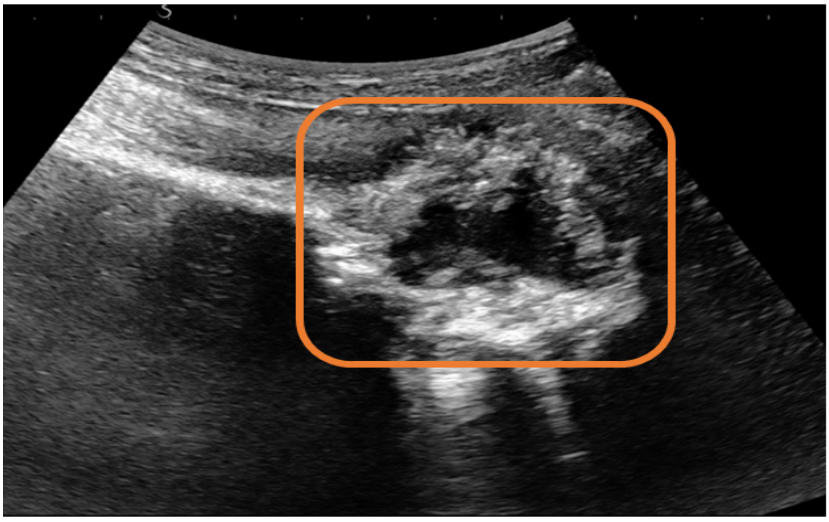

Figure 2: Conventional ultrasound.

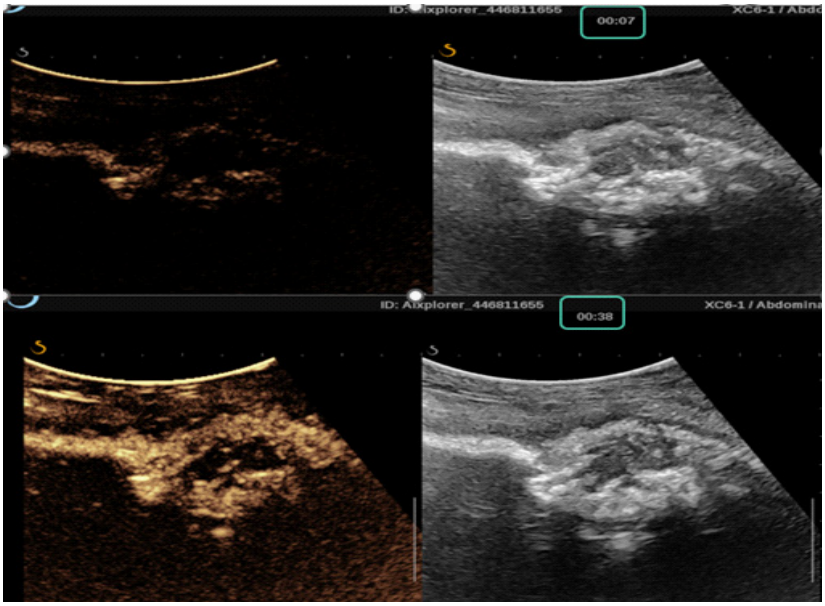

Figure 3: Contrast-enhanced ultrasound.

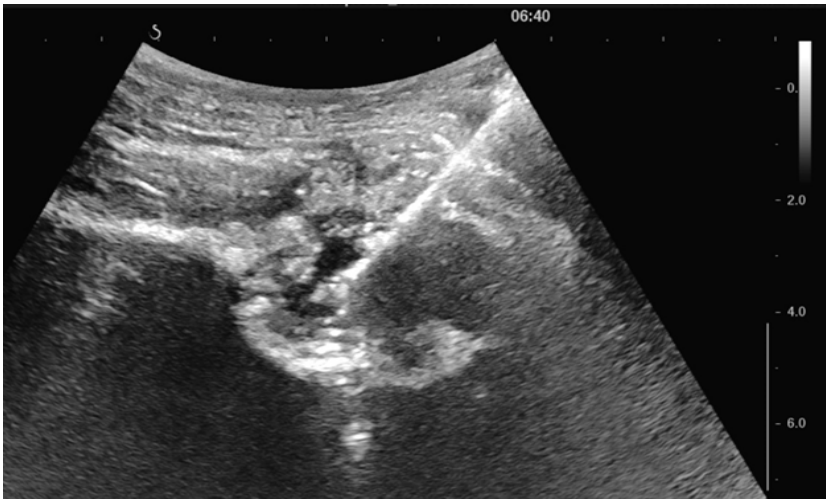

Figure 4: Real-time CEUS.

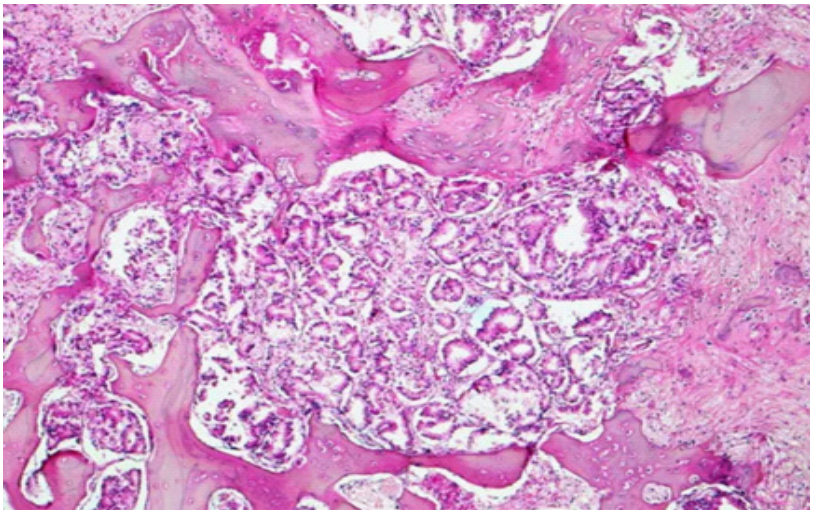

Figure 5: Real-time CEUS.

- Histopathology revealed metastatic adenocarcinoma (Figure 5).
- Immunohistochemistry confirmed prostatic origin (PSA positive).

Final diagnosis: bone metastasis from prostate cancer.

Conclusion

- CEUS is a valuable imaging modality for assessing suspicious bone lesions, especially in elderly or high-risk patients.
- It offers dynamic perfusion insights and enables safe, precise biopsy guidance.
- In this case, CEUS led to detection and histologic confirmation of prostate cancer metastasis.