

# Interesting images

## Role of [18F]FDG PET/CT in the evaluation of inflammatory breast cancer: A case report



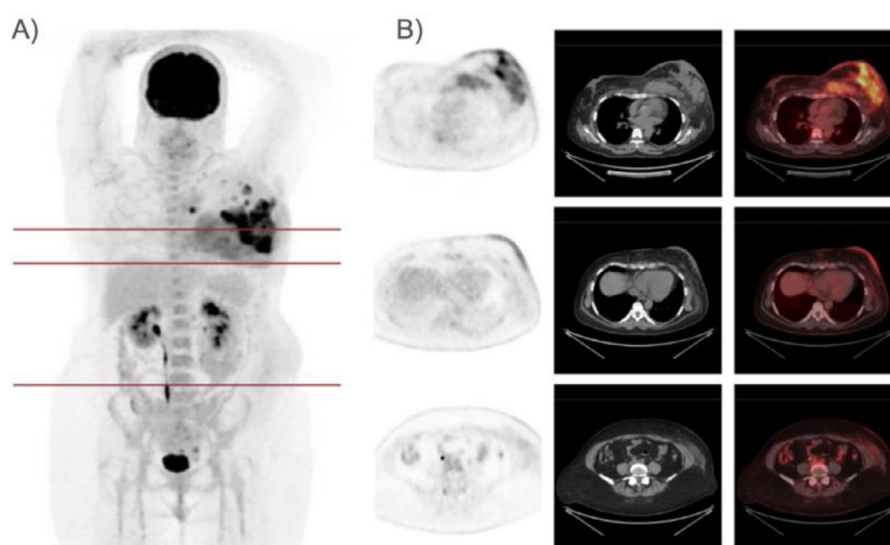
### Papel de la [18F]FDG PET/TC en la valoración del carcinoma ductal infiltrante de mama inflamatorio: a propósito de un caso

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**Figure 1.** A) MIP image (maximum intensity projection) showing a large hyperenhancement in the left breast as well as small axillary and ipsilateral mediastinal deposits in relation to the pathological lymphadenopathies. Moderate bone marrow hypermetabolism, of probable reactive aetiology.

B) PET, CT and PET/CT fusion images, all in axial plane, mediastinal window and in different slices throughout the study, in which the primary tumour can be seen at the level of the breast (66 × 123 × 92 mm (AP×TxCC)), with infiltration of the ipsilateral pectoral musculature and hypermetabolic adenopathies at the left axillary level. Extensive inflammatory involvement of the subcutaneous and cutaneous cellular tissue on the left side compared to the contralateral side.

We present a case of a supernumerary kidney (SK) fused with the isthmus of a horseshoe kidney (HK) in a child, where the initial suspicion was raised by a dynamic renal scintigraphy with [<sup>99m</sup>Tc]Tc-MAG3.

A six months' old female was antenatally diagnosed with a unilateral left sided hydronephrosis in what was thought to be a duplex left kidney at a renal ultrasound scan (US). Her postnatal US (Fig. 1) demonstrated a mild dilatation of the left lower moiety renal pelvis and proximal ureter. In view of those findings she underwent a [<sup>99m</sup>Tc]Tc-MAG3 dynamic renal scintigraphy to investigate the renal parenchymal function and the drainage. The study

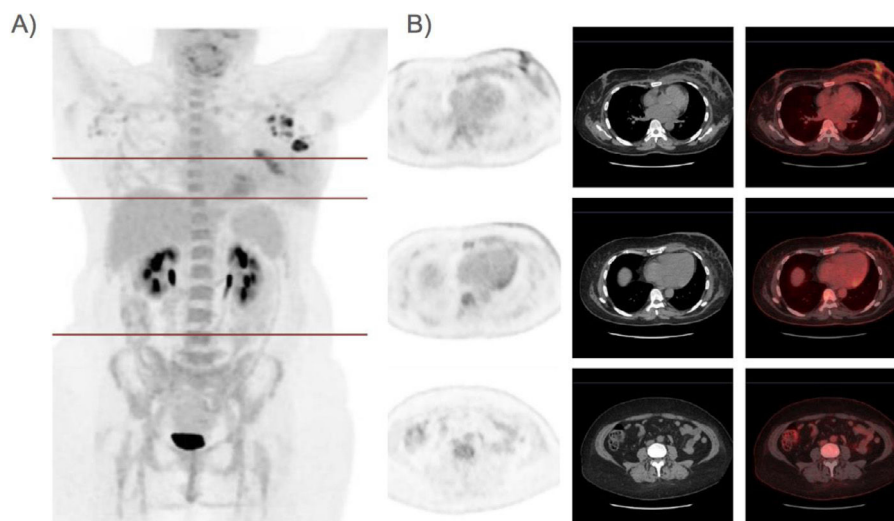
was not convincing for a left duplex collecting system but showed a HK and raised the suspicion of the presence of a SK within the isthmus of the HK (Fig. 2).

During follow up she was asymptomatic, and no other radiological examinations were requested. However, at 2 years of age, she presented with progressive abdominal distention and fever. An US showed a solid mass in the abdomen. Subsequently, a contrast enhanced CT and MRI scans revealed a heterogeneous mass consistent with a Wilms' tumour (Fig. 3A,B) and confirmed the presence of a SK arising from the isthmus of a HK, from which the tumoral lesion emerged. Whole genomic sequencing to examine the tumour and germline molecular status was requested; the results are not finalised yet.

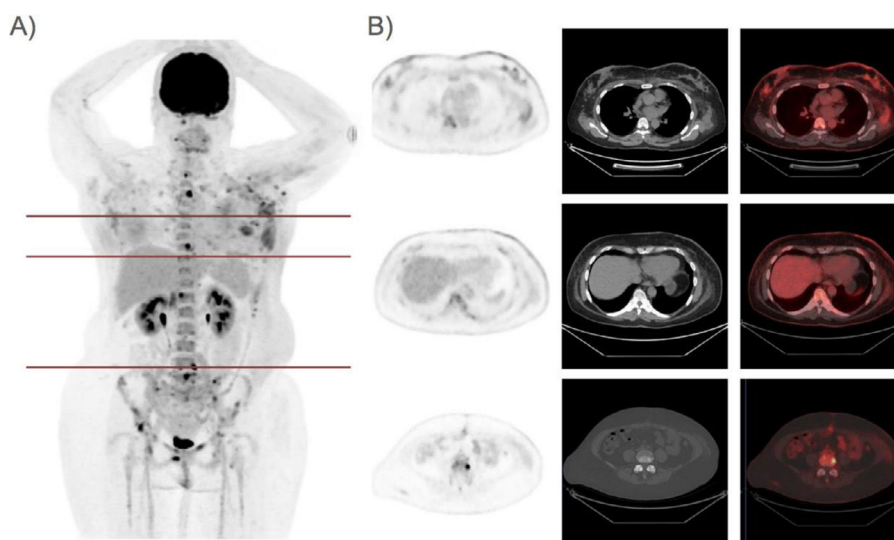
Multimodal therapy consisted of neoadjuvant chemotherapy followed by a nephron-sparing surgery that revealed a stage III

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**Figure 2.** (A) MIP image (maximum intensity projection) showing a significant decrease in the size of the large hyperenhancement located in the left breast. Slightly intense hypermetabolic foci in the right axilla, attributable to lymphadenopathies of probable tumour aetiology. (B) PET, CT and PET/CT fusion images in axial plane and mediastinal window, showing a marked decrease in the size and metabolism of the lesion in the left breast ( $38 \times 24 \times 38$  mm (APxTxCC)), as well as the pectoral infiltration and the ipsilateral axillary lymph nodes.



**Figure 3.** (A) MIP image (maximum intensity projection) showing significant progression of the underlying oncological disease (current SUVmax of the left breast of 8.9 g/ml). (B) PET, CT and PET/CT fusion images in axial plane and mediastinal and bone window, showing tumour involvement in both breasts and multiple new bone lesions. There is also a notable progression of the associated inflammatory component.

Wilms tumour; and noted the presence of the SK arising from the isthmus of the HK. Post-operative treatment included proton beam therapy and adjuvant chemotherapy. The MRI 3 months at the end of treatment showed no tumour residue or recurrence. The patient remains asymptomatic and in remission two years since Wilms' tumour was diagnosed.

A SK is a rare congenital renal anomaly.<sup>1</sup> Its embryological development is not fully understood; however, it is thought to originate from an aberrant division of the nephrogenic cord into two metanephric blastemas at 5<sup>th</sup> to 7<sup>th</sup> week gestation. As a result, two kidneys are formed on the same side, with completely or partially duplicated ureteral buds.<sup>1</sup> It can be associated with numerous congenital anomalies, and with an increased incidence of renal malignancies.<sup>1</sup>

The first imaging modality generally performed to evaluate congenital anomalies of the urinary tract is renal ultrasound, leaving MRI and CT scans if a surgical intervention is planned.<sup>2</sup> Dynamic renal scintigraphy with [ $^{99m}\text{Tc}$ ]Tc-MAG3 has a key role in eval-

uating renal function and also has a role in evaluating renal, pyelocalyceal, ureteral, and bladder anatomy, especially in the pediatric population.<sup>3</sup> Additionally, this technique can be used in patients with renal insufficiency who are not suitable for CT-based imaging with contrast, achieving a lower radiation exposure.

### Ethical statement

This research work involving human subjects has been conducted in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. The manuscript adheres to the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals, ensuring the highest ethical standards. The study aims to include representative human populations in terms of sex, age, and ethnicity, as recommended by these guidelines. The terms "sex" and "gender" have been used accurately and appropriately throughout the manuscript.

## Declaration of interest

The authors affirm that they have no financial or personal relationships with any individuals or organizations that could potentially influence or bias their work. The privacy rights of the human subjects involved in this research have been meticulously observed and protected. We affirm our commitment to conducting ethical research and ensuring the welfare and rights of human participants throughout the study process.

## References

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