

# FDG PET And Adrenocortical Carcinoma: A Case Of Tumour Embolism

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## Citation

M Lin, C Saunders, R Cuganesan, P Campbell, L Trinh, P Lin. *FDG PET And Adrenocortical Carcinoma: A Case Of Tumour Embolism*. The Internet Journal of Surgery. 2006 Volume 9 Number 1.

## Abstract

We present a case of adrenocortical carcinoma with IVC invasion and an unsuspected metastatic deposit in the right lung identified on FDG PET scan. This case highlights the utility of FDG PET at initial staging and its ability to detect distant metastatic disease.

## INTRODUCTION

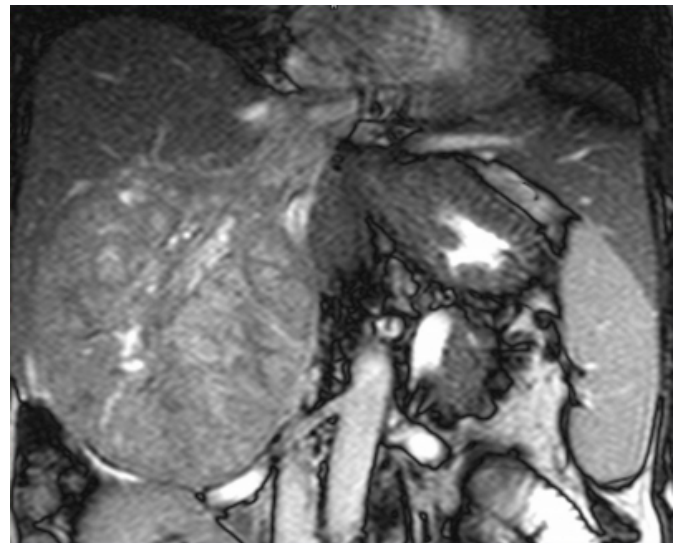
Adrenocortical carcinoma (ACC) is a rare malignancy with a poor prognosis. Distant metastatic disease in either lung or liver is common at presentation and the five year survival for Stage IV disease is 10% [1]. Accurate initial staging is therefore essential. Although  $F^{18}$ -2-fluoro-2-deoxy-D-glucose (FDG) positron emission tomography (PET) FDG PET is utilised in staging and restaging various malignancies [2,3,4], its role in ACC has not been defined. We report a case of ACC with local invasion and an unsuspected pulmonary metastasis as a result of tumour embolism identified on FDG PET scan.

## CASE REPORT

A 53 year old previously well woman presented with a three months' history of abdominal bloating, acne and hirsutism. Serum investigations confirmed hyperandrogenism with elevated androstenedione (90nmol/L, NR 0-3) and testosterone (14.3nmol/L, NR 1.0-4.5) levels and a free androgen index of 57% (NR 1-8). MRI scan (Siemens Symphony 1.5T, Siemens Medical Systems, Erlangen, Germany) of the abdomen (Figure 1) demonstrated a 12cm heterogenous right adrenal tumour with extension into the suprahepatic inferior vena cava (IVC) to the level of the right atrium.

## Figure 1

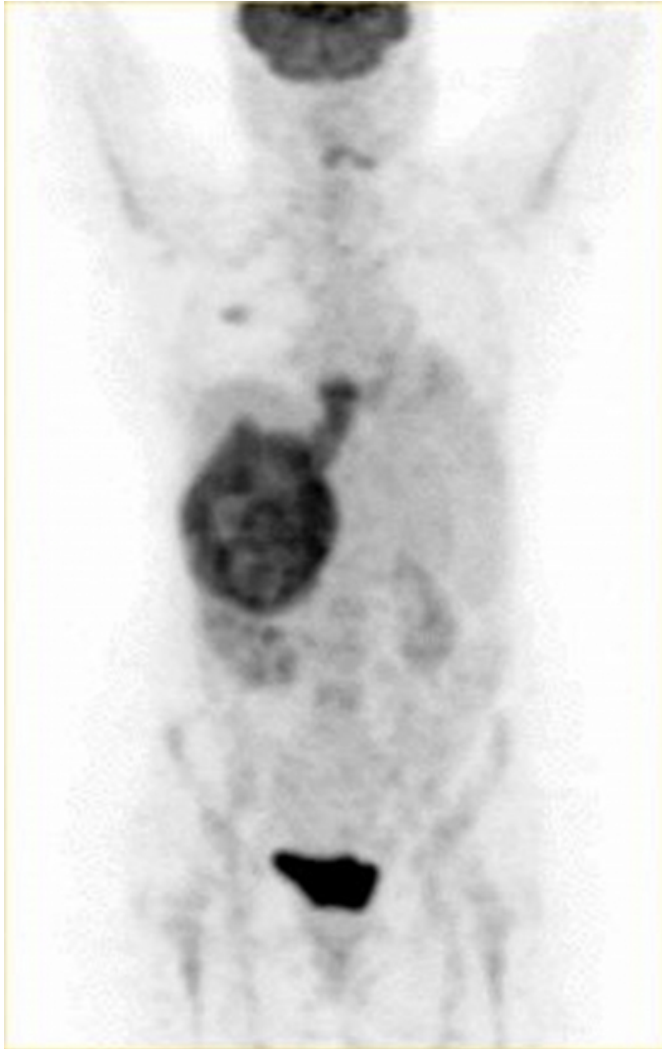
Figure 1: Coronal true FISP (Fast Imaging with Steady Precession) image – Siemens Symphony 1.5T – TE 2.1ms, TR 4.3 ms, FA 80 demonstrates a large right adrenal mass of heterogeneous signal intensity with extension into the inferior vena cava and right atrium.



Further staging with a dedicated PET scanner in three dimensional mode was performed (Allegro, Philips Medical system, Milpitas, CA). The patient fasted for more than 4 hours and serum glucose level was 4.7mmol/L prior to imaging. PET scanning commenced 60 minutes after the intravenous injection of 5.14MBq/kg of FDG. This confirmed a hypermetabolic right suprarenal lesion (Figure 2) with a standardized uptake value (SUV) of 5.9 (a semi-quantitative index of glucose metabolism in tissues).

**Figure 2**

Figure 2: Anterior maximum intensity projection image on FDG PET which demonstrates a large intensely FDG avid suprarenal lesion with extensive local invasion and a metastatic deposit noted in the right lung.



In addition, it also demonstrated extensive loco-regional invasion as well as a metastatic deposit in the right mid zone of lung with a SUV of 2.5. The patient underwent extensive surgery which revealed a large invasive right adrenocortical carcinoma (ACC). She was subsequently commenced on palliative chemotherapy comprising adriamycin and cisplatin to which she had a good therapeutic response.

**DISCUSSION**

Dissemination at the time of diagnosis in ACC is common and is recognised as a poor prognostic factor [5]. Although FDG PET is now a well established functional imaging modality in oncology, the literature with regards to its utility in ACC, in particular at initial diagnosis, is limited. This case illustrates FDG PET is complementary to conventional

imaging techniques in demonstrating tumour invasion into the IVC and the right atrium and more importantly, the detection of a pulmonary metastasis as a result of tumour embolism. This is not dissimilar to many other tumour groups where whole body FDG PET scanning detects unsuspected distant metastases at staging [6,7,8] and plays a similar role in ACC.

FDG PET can also provide prognostic information and the intensity of FDG uptake (SUV) and FDG uptake volume have been shown to correlate with survival in ACC [9]. In patients with suspected recurrence, FDG PET is complementary to thoracoabdominopelvic computed tomography and is recommended in patients with high clinical suspicion for recurrence or metastases despite negative anatomical results and in those with non-functional tumours [9,10].

In conclusion, we highlight the addition of FDG PET to conventional imaging techniques for staging and follow-up in patients with ACC.

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