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*CASE REPORT*

# Primary adrenal lymphoma mimicking physiological kidney uptake on [$^{18}$F]FDG PET/CT

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**ABSTRACT**

An 80-year-old man with a history of abdominal pain and fatigue was evaluated for bilateral adrenal masses of unknown origin. He was referred to our department for [$^{18}$F]FDG PET/CT imaging to further investigate the nature of these masses. The scan showed intense [$^{18}$F]FDG uptake in both adrenal glands, which could initially be mistaken for physiological kidney uptake. A subsequent adrenal biopsy confirmed the diagnosis of B-cell lymphoma. Follow-up [$^{18}$F]FDG PET/CT imaging showed complete metabolic response to treatment. This case highlights the critical role of [$^{18}$F]FDG PET/CT in identifying malignant adrenal lesions and underscores the importances of considering primary adrenal lymphoma in the differential diagnosis when encountering intense, bilateral adrenal hypermetabolism.

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## INTRODUCTION

This case report describes an 80-year-old man with abdominal pain and fatigue who was found to have bilateral adrenal masses. [18F]FDG PET/CT revealed significantly enlarged, hypermetabolic adrenal glands. Pathological evaluation confirmed B-cell lymphoma, emphasizing the need to consider primary adrenal lymphoma in the differential diagnosis, despite its rarity.

## CASE PRESENTATION

We present an 80-year-old man with a history of abdominal pain and fatigue. Upon undergoing abdominal CT imaging, bilateral adrenal masses of unknown origin were discovered. The patient was subsequently referred to our department for [18F]FDG PET/CT imaging to further investigate the possibility of metastasis. Following the intravenous injection of 6.19 mCi [18F]FDG PET/CT, imaging was conducted 62 minutes later. The results revealed enlarged adrenal glands with significant hypermetabolic activity, which could initially be misinterpreted as physiological renal uptake (correlation with the underlying CT images allowed differentiation between the kidneys and the enlarged adrenal glands). The right adrenal gland measured 74 × 43 × 82 mm (SUVmax = 30.09), while the left adrenal gland measured 76 × 46 × 70 mm (SUVmax = 29.91) (Figures 1A and 1B). Small lymph nodes in the superior mesenteric and para-aortic regions showed mild [18F]FDG uptake (Figure 1C), while no other hypermetabolic or abnormal lesions were detected in reminder of the body. Biopsy of the adrenal mass confirmed the diagnosis of B-cell lymphoma. The patient was started on systemic chemotherapy with the R-CHOP regimen, the standard treatment for PAL. A follow-up [18F]FDG PET/CT performed six months later demonstrated complete metabolic response to treatment (Figure 2).

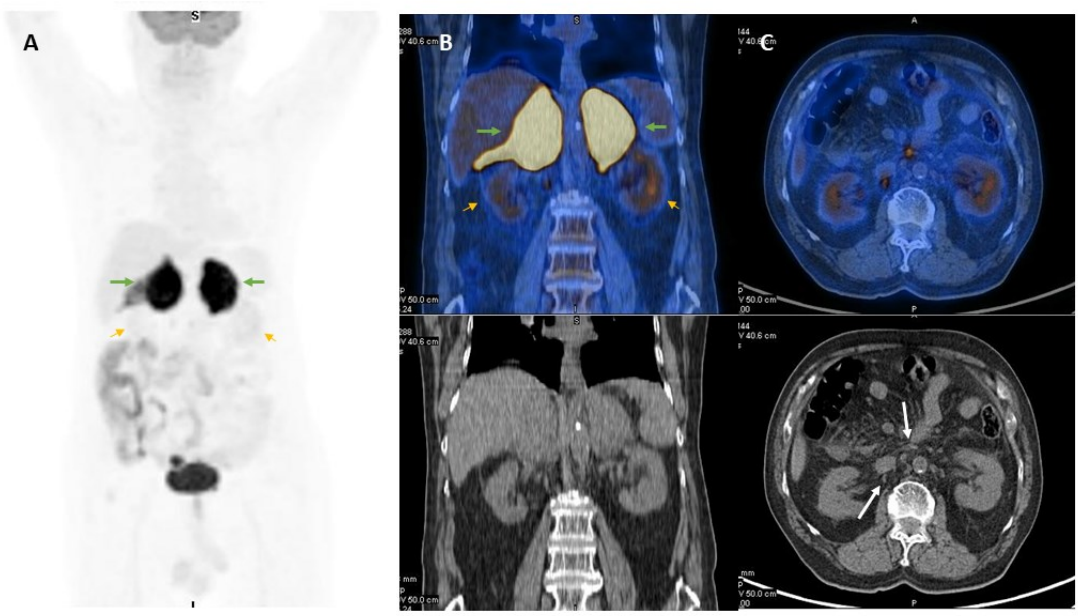


**Figure 1.** High-intensity uptake in the adrenals (green arrows) may initially be mistaken for the physiological uptake of the kidneys (yellow arrows). Also, mild [18F]FDG uptake is noted in small lymph nodes in the superior mesenteric and para-aortic regions (C, arrows). No other hypermetabolic or abnormal lesions were identified elsewhere in the body

## DISCUSSION

Non-Hodgkin lymphoma (NHL) can affect the adrenal glands, presenting as primary or secondary forms, with the latter being more prevalent. Primary Adrenal Lymphoma (PAL) is an extremely rare subtype of NHL, constituting less than 1% of cases. Typically seen in males aged 60-70 years, PAL exhibits systemic B-symptoms, abdominal or back pain, and fatigue in a significant number of cases. Lymphoid cell infiltration causes enlargement of the adrenal gland, but its characteristic triangular shape remains preserved [1-3].

Diagnosis of PAL should be considered in individuals with bilateral adrenal masses, with or without lymphadenopathy and endocrine dysfunction. It is essential to distinguish PAL from metastatic diseases involving both adrenal glands for proper treatment planning.

The distinguishing features that helped differentiate PAL from other pathologies in this case include bilateral adrenal involvement, absence of a known primary malignancy, very high [$^{18}$F]FDG uptake on PET/CT (SUVmax >25–30), and the preserved adrenal shape despite enlargement [1, 3-4].

In patients with primary adrenal lymphoma, CT imaging often reveals large, bilateral adrenal masses, typically with heterogeneous density and mild to moderate contrast enhancement. [$^{18}$F]FDG PET/CT usually demonstrates intense [$^{18}$F]FDG uptake in adrenal lesions and can detect extra-adrenal involvement. In this case, the absence of extra-adrenal hypermetabolism—possibly due to early disease stage—and the lack of adrenal insufficiency were favorable prognostic indicators. The patient responded well to systemic therapy [1-3].

In conclusion, when bilateral hypermetabolic adrenal masses are seen on [$^{18}$F]FDG PET/CT imaging, it is important to consider a broad differential diagnosis that includes uncommon conditions such as myelolipoma [4], pheochromocytoma [5], tuberculosis [6], and primary adrenal lymphoma, in addition to more common causes like adenoma and adrenal metastasis [7, 8].

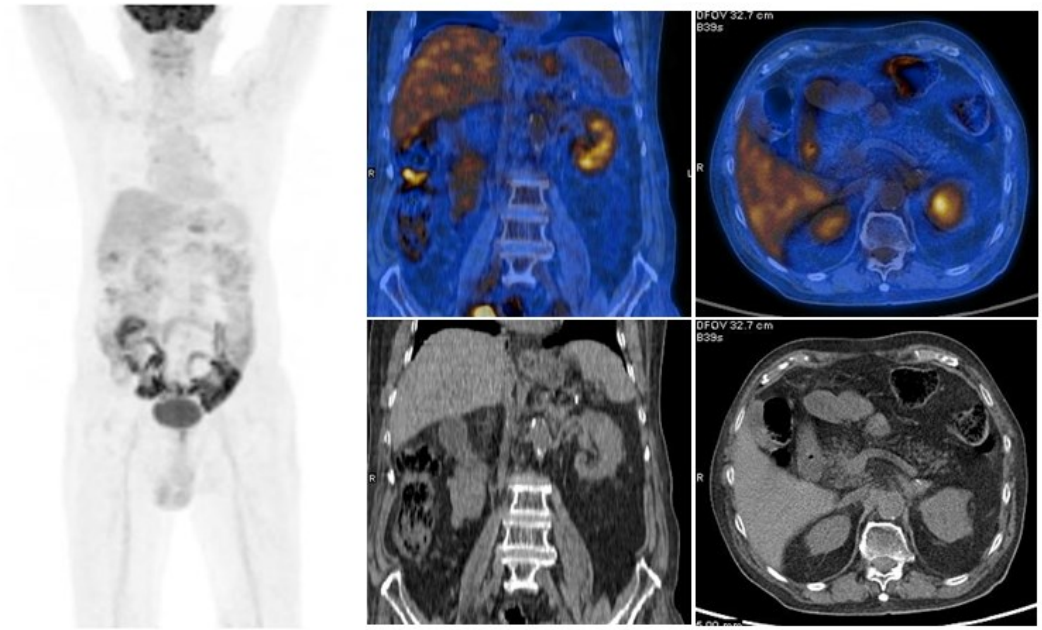

**Figure 2.** [$^{18}$F]FDG PET/CT image obtained 6 months after treatment shows normal physiological biodistribution of [$^{18}$F]FDG throughout the body. No abnormal uptake is observed in the adrenal bed, indicating complete metabolic response to treatment

## CONCLUSION

In cases of bilateral hypermetabolic adrenal masses detected on [$^{18}$F]FDG PET/CT imaging, the differential diagnosis should include both common and rare conditions, including primary adrenal lymphoma.

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