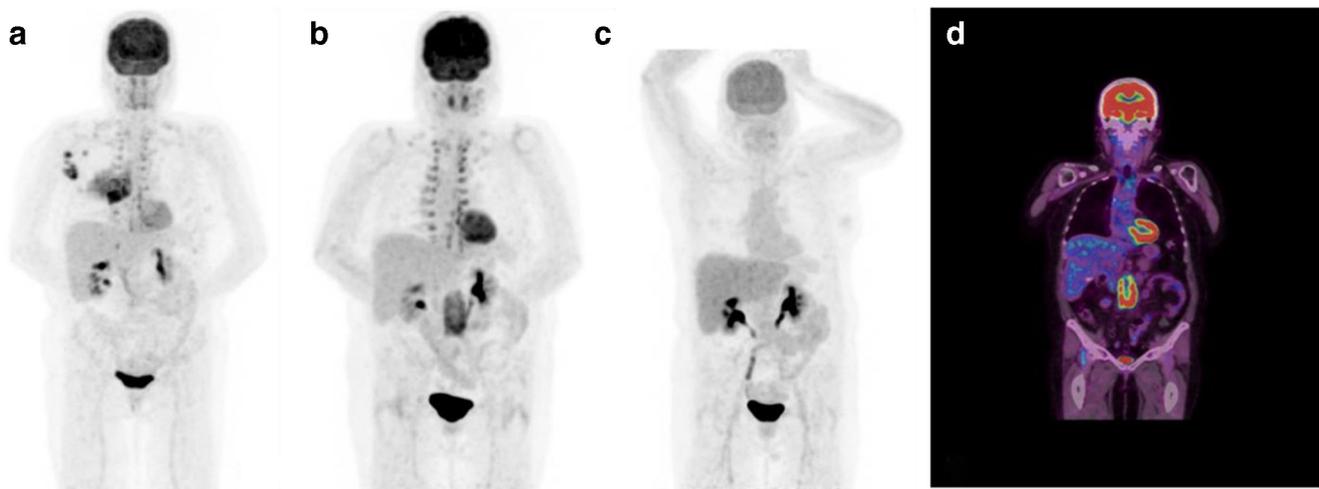




## Retroperitoneal fibrosis in on-going anti-PD-1 immunotherapy detected with [<sup>18</sup>F]-FDG PET/CT

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A patient with metastatic lung adenocarcinoma was placed on immunotherapy with nivolumab. A first [<sup>18</sup>F]-FDG PET/CT examination was performed before immunotherapy (*a.*). Two years after having initiated nivolumab, [<sup>18</sup>F]-FDG PET/CT showed an almost complete metabolic response, but revealed the occurrence of a hypermetabolic infiltration surrounding the abdominal artery and primary iliac arteries (*b., d.*). This

raised the potential diagnosis of retroperitoneal fibrosis (RPF) in the specific context of immunotherapy, although the assumptions of lymph node infiltration related to pulmonary adenocarcinoma, or lymphoproliferative syndrome, could not be eliminated. The histologic analysis confirmed the diagnosis of iatrogenic RPF.

Three months after immunotherapy discontinuation and administration of corticosteroid, imaging was in favour of a partial metabolic response of RPF, without signs of neoplastic relapse (*c.*)

Retroperitoneal fibrosis is a rare disease characterized by a proliferation of inflammatory cells in the retroperitoneum. The underlying pathophysiology is not clear [1]. Although widely known as an idiopathic disease, for one third of the cases, RPF occurs secondary to neoplasms, infection, aortic aneurysms, or as an adverse consequence of treatments. Several cases of RPF have been described with [<sup>18</sup>F]-FDG. However, to the best of our knowledge, we report herein the first [<sup>18</sup>F]-FDG

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imaging of RPF in a patient undergoing immunotherapy [2]. One possible explanation would be the reactivation of antigen presentation by antigen-presenting cells. This result could be added to other immune side effects one should keep in mind while interpreting [ $^{18}\text{F}$ ]-FDG PET/CT [3]. [ $^{18}\text{F}$ ]-FDG PET/CT could be a valuable tool to monitor patients undergoing steroid therapy [4].

### Compliance with ethical standards

**Conflict of interests** No author has any conflict of interest to declare.

### References

1. Vaglio A, Maritati F. Idiopathic retroperitoneal fibrosis. *J Am Soc Nephrol*. 2016;27(7):1880–9.
2. Fernández-López R, Lojo JA, Acevedo-Báñez I, González-León R, Borrego-Dorado I. (18)F-FDG PET/CT in patients with idiopathic retroperitoneal and mediastinal fibrosis. *Eur J Nucl Med Mol Imaging*. 2016;43(9):1739–40.
3. Aide N, Hicks RJ, Le Tourneau C, Lheureux S, Fanti S, Lopci E. FDG PET/CT for assessing tumour response to immunotherapy: report on the EANM symposium on immune modulation and recent review of the literature. *Eur J Nucl Med Mol Imaging*. 2019;46(1):238–50.
4. Fernando A, Pattison J, Horsfield C, D’Cruz D, Cook G, O’Brien T. [ $^{18}\text{F}$ ]-Fluorodeoxyglucose positron emission tomography in the diagnosis, treatment stratification, and monitoring of patients with retroperitoneal fibrosis: a prospective clinical study. *Eur Urol*. 2017;71(6):926–33.

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