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Case Report

Role of ^{18}F-FDG PET/CT imaging in the strategic selection of the accessory spleen as a biopsy site for definitive lymphoma diagnosis in a 67-year-old man: A Case report

Rôle de l'imagerie TEP/TDM au ^{18}F-FDG dans la sélection stratégique de la rate accessoire comme site de biopsie pour le diagnostic définitif du lymphome chez un homme de 67 ans : rapport de cas

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ABSTRACT

The role of ^{18}F-FDG PET/CT in lymphoma staging and treatment response assessment is well established in the literature. Beyond these conventional applications, it can also serve as a powerful tool for guiding biopsy decisions in diagnostically challenging cases. We present the case of a 67-year-old man with suspected lymphoma, in whom initial diagnostic procedures—including bone marrow aspiration—failed to yield conclusive results. A multidisciplinary team utilized ^{18}F-FDG PET/CT to identify an accessory spleen exhibiting metabolic activity comparable to the primary spleen. Given its accessibility and diagnostic potential, the accessory spleen was surgically excised, leading to a definitive diagnosis of mantle cell lymphoma. This case underscores the strategic role of PET/CT in biopsy site selection, offering a safer and less invasive diagnostic alternative and reinforcing its crucial role in lymphoma management.

RÉSUMÉ

Le rôle de la TEP/TDM au ^{18}F-FDG dans le stadification du lymphome et l'évaluation de la réponse au traitement est bien établi dans la littérature. Au-delà de ses indications conventionnelles, la TEP/TDM peut également constituer un complément précieux pour orienter le choix du site de biopsie dans les cas diagnostiques complexes. Nous présentons le cas d'un homme de 67 ans suspecté de lymphome, chez qui les procédures diagnostiques initiales, y compris l'aspiration de la moelle osseuse, n'ont pas permis d'obtenir des résultats concluants. Une équipe multidisciplinaire a utilisé la TEP/TDM au ^{18}F-FDG pour identifier une rate accessoire présentant une activité métabolique comparable à celle de la rate principale. Compte tenu de son accessibilité et de son intérêt diagnostique, cette rate accessoire a été excisée chirurgicalement, conduisant à un diagnostic définitif de lymphome à cellules du manteau. Ce cas met en évidence le rôle stratégique de la TEP/TDM dans la sélection du site de biopsie, offrant une alternative diagnostique plus sûre et moins invasive, et renforçant son importance cruciale dans la prise en charge du lymphome.

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1. Introduction

The use of ^{18}F-FDG PET/CT in lymphoma patients is well-documented in the literature, offering superior sensitivity in staging and treatment response assessment compared to conventional imaging modalities [1–4]. Beyond its established role in staging and monitoring, ^{18}F-FDG PET/CT also serves as a crucial tool in determining optimal biopsy sites in cases where standard biopsy methods are inconclusive or unfeasible. In this particular case, no peripheral lymph nodes were deemed suitable for excisional biopsy. Instead of performing a splenectomy or trucut biopsy of the spleen-both invasive and high-risk options—the surgical resection of an accessory spleen, which exhibited metabolic activity similar to that of the primary spleen, was proposed. Through this case, we aim to emphasize the additional benefit of PET/CT in guiding biopsy site selection in lymphoma diagnosis. This case demonstrates an additional application of PET/CT in guiding biopsy decisions in complex lymphoma presentations, where conventional methods fail.

2. Case presentation

We report the case of a 67-year old male patient who presented to the emergency department with complaints of pancytopenia, exertional dyspnea, and generalized weakness. Bone marrow aspiration was performed to investigate the underlying cause of pancytopenia; however, the results were inconclusive. Abdominal ultrasound (US) and CT imaging revealed significant splenomegaly, raising clinical suspicion of lymphoma. To determine the most suitable biopsy site, an oncological ^{18}F-FDG PET/CT scan was conducted. The PET/CT findings demonstrated diffusely increased, mild FDG uptake throughout the enlarged spleen (SUVmax 5.4; SUVmean 2.3). Additionally, a nodular lesion measuring approximately 3 cm, located anteromedially to the spleen and adjacent to the anterior abdominal wall, exhibited homogeneous FDG uptake similar to that of the spleen as shown in Fig. 1A and B. This lesion was identified as an accessory spleen (SUVmax 2.4; SUVmean 2.1) as shown in Fig. 1C and D. Since no other lesions suitable for excisional biopsy were detected on whole-body PET/CT imaging, the accessory spleen was considered a viable biopsy target.

Subsequently, the accessory spleen was successfully resected via laparoscopic surgery. Histopathological analysis confirmed the diagnosis of mantle cell lymphoma. The patient was then initiated on R-CHOP chemotherapy (rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone). Following eight cycles of R-CHOP, PET/CT imaging was performed to assess treatment response, revealing significant metabolic remission and a reduction in splenic size. Post-treatment PET/CT images demonstrated decreased FDG uptake and spleen shrinkage, confirming a favorable therapeutic response as shown in Fig. 1E–H. Moreover, the utility of PET/CT extended beyond diagnosis, aiding in post-therapy response evaluation and the assessment of metabolic remission following chemotherapy (Annex 1). The patient remains under the ongoing care of the hematology department for continued surveillance and management. In July 2022, the patient was referred to an external specialized center for autologous stem cell transplantation, aiming to pursue a higher level of care and potential disease consolidation.

3. Discussion

Functional imaging with ^{18}F-FDG PET/CT has significantly enhanced lymphoma staging and response assessment. Compared to conventional imaging techniques such as contrast-enhanced CT and MRI, PET/CT offers superior sensitivity and specificity. Previous studies have demonstrated that PET-based imaging improves initial staging accuracy and influences treatment decisions in approximately 30–50% of lymphoma cases [1–5].

Accessory spleens, congenital ectopic splenic remnants, are found in 10–30% of the general population and are often clinically insignificant. However, in specific clinical scenarios—such as hematologic malignancies—the presence of an ectopic spleen

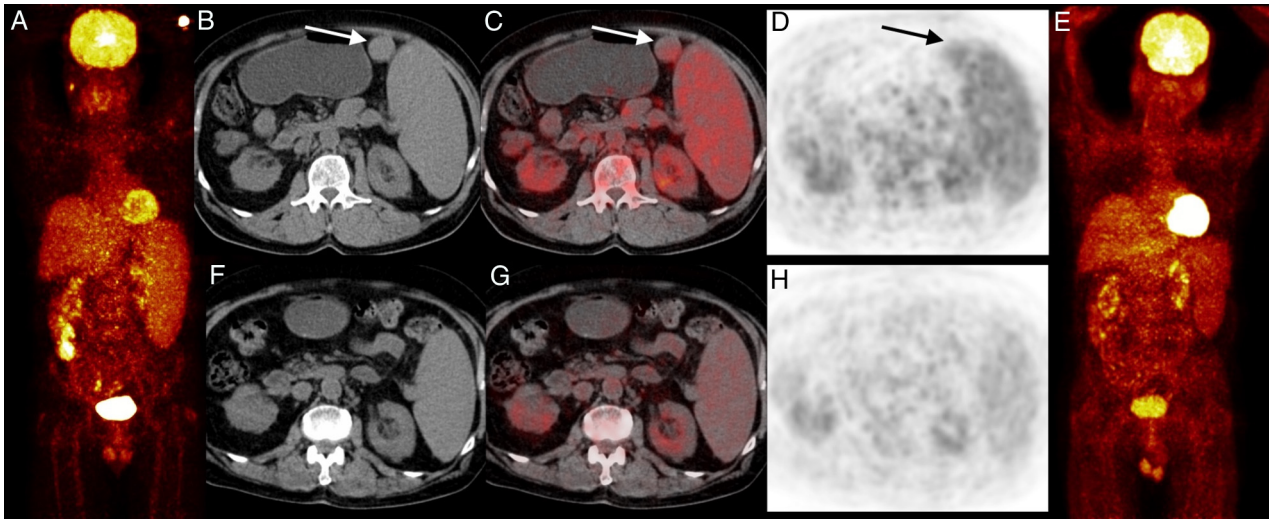

Fig. 1. A. Maximum Intensity Projection (MIP) demonstrates splenomegaly with slightly increased FDG uptake. B. CT confirms the presence of an accessory spleen. C and D. Fusion and PET imaging revealing well-defined splenic borders with homogeneous FDG uptake (shown by arrows in the figure). In Whole Body PET, no other lesions were observed that could be evaluated as a sectional biopsy site, so we recommended laparoscopic removal of the accessory spleen. E. Follow-up MIP image indicating a favorable treatment response after eight cure RCHOP chemotherapy protocol. F–H. Axial CT, Fusion and PET images demonstrating splenic shrinkage and decreased FDG uptake following treatment.

A. La projection d'intensité maximale (MIP) montre une splénomégalie avec une légère augmentation de la fixation du FDG. B. La tomodensitométrie confirme la présence d'une rate accessoire. C et D. L'imagerie par fusion TEP a révélé des contours spléniques bien définis avec une fixation homogène du FDG (indiquée par les flèches sur la figure). L'examen TEP corps entier n'a pas mis en évidence d'autres lésions pouvant faire l'objet d'une biopsie segmentaire, nous avons donc recommandé l'ablation laparoscopique de la rate accessoire. E. Image MIP de suivi indiquant une réponse favorable au traitement après huit cures du protocole de chimiothérapie RCHOP. F–H. Les images TDM axiales, de fusion et TEP démontrent une réduction du volume de la rate et une diminution de la fixation du FDG après le traitement.

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(accessory spleen or splenosis) can become highly relevant [6]. In particular, distinguishing between reactive hyperplasia and malignant infiltration in cases of splenic marginal zone lymphoma (SMZL) or diffuse large B-cell lymphoma (DLBCL) can be challenging [7].

This case further emphasizes the necessity of interdisciplinary collaboration in leveraging PET/CT data for optimal biopsy site selection. In this instance, the accessory spleen was chosen as the diagnostic target in the absence of an identifiable nodal lesion. This strategy aligns with current data suggesting that PET-guided biopsies improve diagnostic yield by reducing the false-negative rates associated with random bone marrow aspiration. The possibility of false positives or challenges in differentiating benign accessory spleens from malignant infiltration (e.g., in low-grade lymphomas or inflammatory conditions) should also be acknowledged. Broccoli et al. (2020) demonstrated the high diagnostic accuracy of PET/CT-driven biopsy for lymphoma diagnosis, underscoring the value of PET guidance in improving biopsy yield and minimizing false negatives [8]. Additionally, this case highlights the significance of a collaborative, PET/CT-guided approach in the comprehensive management of lymphoma.

4. Conclusion

This case report illustrates the pivotal role of ^{18}F-FDG PET/CT in facilitating the precise selection of an accessory spleen as a biopsy site for the rapid and accurate diagnosis of lymphoma. By offering a minimally invasive alternative to splenectomy or tru-cut biopsy, PET/CT enhances diagnostic efficiency while minimizing patient morbidity, reinforcing its indispensable role in modern lymphoma management.

Authors contributions

All authors participated in creating content for the manuscript, editing and provided final approval for submission. No undisclosed authors contributed to the manuscript.

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Disclosure of interest

The authors declare that they have no competing interest.

Since the manuscript describes a single case, ethics approval from the university was not obtained. An approval from review board of the associated institutions was obtained, and the paper was prepared afterwards. The patient was informed about the protocols, procedures, risks, and benefits, as well as possible use of the recorded materials in the hospitals' database system for academic purposes, and a signed consent was obtained by the patient.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.mednuc.2025.09.010.

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