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[^{68}Ga]Ga-FAPI-46 PET in a Borderline Ovarian Tumor

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Borderline ovarian tumors (BOTs) count for approximately 15% of all epithelial tumors of the ovaries and show malignant and nonmalignant aspects (*1*,*2*). They present with nuclear abnormalities and cellular proliferation but usually not an infiltrative growth pattern. Thus, with a 5-y survival rate of 95%–97%, they have a better prognosis than malignant ovarian tumors (MOTs) even if BOTs can spread to the peritoneum and to lymph nodes (*1*,*2*). Applying to BOTs surgical procedures that are normally used for MOTs might cause overtreatment. In many instances, surgeons rely on intraoperative frozen-section evaluation to help guide decision-making about the radicality of the surgery and the feasibility of surgical approaches to preserve fertility or the ovaries. But intraoperative frozen sections have limitations (*3*); as a result, in some cases second staging operations may be needed.

Differentiation of BOTs from MOTs can be difficult with ultrasound, CT, and MRI (*4*). Even if [^{18}F]FDG PET/CT is not commonly used in clinical routine to characterize ovarian masses, some studies report that [^{18}F]FDG PET/CT might be able to distinguish BOTs from MOTs. However, BOTs can also exhibit significant [^{18}F]FDG uptake (*5*). Given the potential value of fibroblast activation protein–targeted PET imaging in multiple tumor entities, including gynecologic oncology, fibroblast activation protein–targeting PET might be able to identify BOTs preoperatively, thus potentially leading to less invasive fertility-sparing surgical approaches.

Here, we report the case of a 48-y-old woman who presented with intermittent pain in the left lower quadrant. [^{18}F]FDG PET/CT showed a heterogeneous pelvic mass with high [^{18}F]FDG avidity (SUV_{max}, 9.0) abutting the posterior uterine body and cervix and the rectosigmoid colon (Fig. 1), as well as an omental haziness and left paracolic nodularity, both without increased

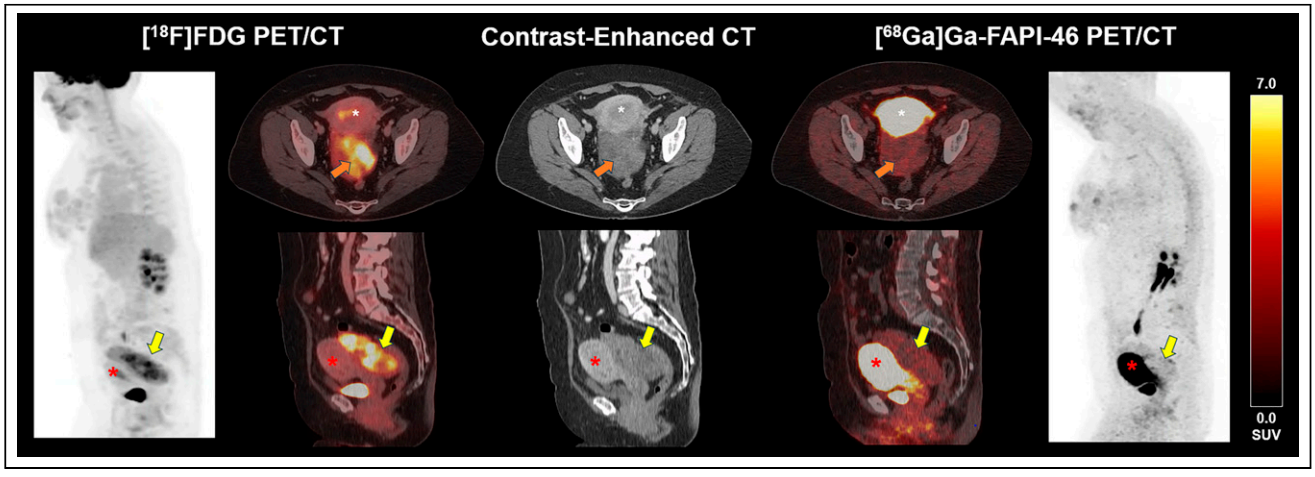

FIGURE 1. Hypermetabolism of heterogeneous, masslike structure in pelvis (arrows) abutting posterior uterine body/cervix (*) and rectosigmoid colon without increased [^{68}Ga]Ga-FAPI-46 uptake. Uterine body shows moderate [^{18}F]FDG avidity as well as highly increased [^{68}Ga]Ga-FAPI-46 uptake.

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hypermetabolism (SUV_{max}, 1.9). In addition, [^{68}Ga]Ga-fibroblast activation protein inhibitor (FAPI)–46 PET was performed 5 d after [^{18}F]FDG PET/CT as part of the exploratory study (NCT 04147494). [^{68}Ga]Ga-FAPI-46 PET did not show significantly increased uptake in the pelvic mass (SUV_{max}, 3.6) or in the omental region (SUV_{max}, 1.2). The uterine body exhibited increased [^{68}Ga]Ga-FAPI-46 uptake and moderate [^{18}F]FDG avidity, probably because of a concomitant inflammatory process and physiologic [^{68}Ga]Ga-FAPI-46 uptake of the uterus as described previously (*6*). Based on the increased [^{18}F]FDG uptake and the highly elevated preoperative CA 125, the index of suspicion for a MOT was high. An intraoperative frozen section of the mass revealed a borderline ovarian neoplasm. Given that the disease was extensive, involving the adnexa bilaterally, and that the patient desired the most definitive surgical treatment to minimize the chance of recurrence or the need for reoperation, we performed a hysterectomy with bilateral salpingo-oophorectomy, omenectomy, bilateral lymph node dissection, and ablation of peritoneal implants. Final histopathology revealed a serous BOT of the left ovary with implants in the uterus, right ovary, omentum, and peritoneum (pT2c [International Federation of Gynecology and Obstetrics stage IIC], pN0).

Given the known high [^{68}Ga]Ga-FAPI-46 uptake of MOTs (*7*) and the low [^{68}Ga]Ga-FAPI-46 uptake in this case of a BOT, [^{68}Ga]Ga-FAPI-46 PET might have the potential to differentiate MOTs from BOTs. Further studies to explore this possibility are warranted.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

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