

TITLE:

The possible role of combined [18F]-Fluro Estradiol (18F-FES) and 18F- FDG PET/CT scans in early detection of molecular heterogeneity and prognosis to hormonal treatment response in metastatic estrogen positive (ER+) breast cancer (BC) patients. A case report.

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AIM OF STUDY:

To estimate the role of combined 18F-FES and 18F-FDG PET/CT scans in detection of molecular heterogeneity, prognosis response to hormonal treatment and close follow up in metastatic ER BC patients.

MATERIALS AND METHODS:

A 28-year-old female with ER+ initially metastatic BC, after excessive treatment for 2 years with almost metabolically negative bone metastases and mildly FDG-avid primary lesion, being on Femara®, Zoladex® and Xgeva®, underwent 18F-FES and 18F-FDG scans after discovering a new axillary metastases, followed by series 18F-FDG and 18F-NaF for close follow up scans.

RESULTS:

18F-FES and 18F-FDG scans showed matching FES/FDG-avid in the primary right breast lesion (fig.1) and axillary lymph nodes (fig.2) (SUVmax FES/FDG for primary lesion 6.33/1.89 and axillary lymph nodes 7.58/6.15) as well as FES negative/FDG-positive newly developed bone lesion in the head of left femur (FDG SUVmax 3.65), confirmed by NaF PET-CT scan (fig.3).

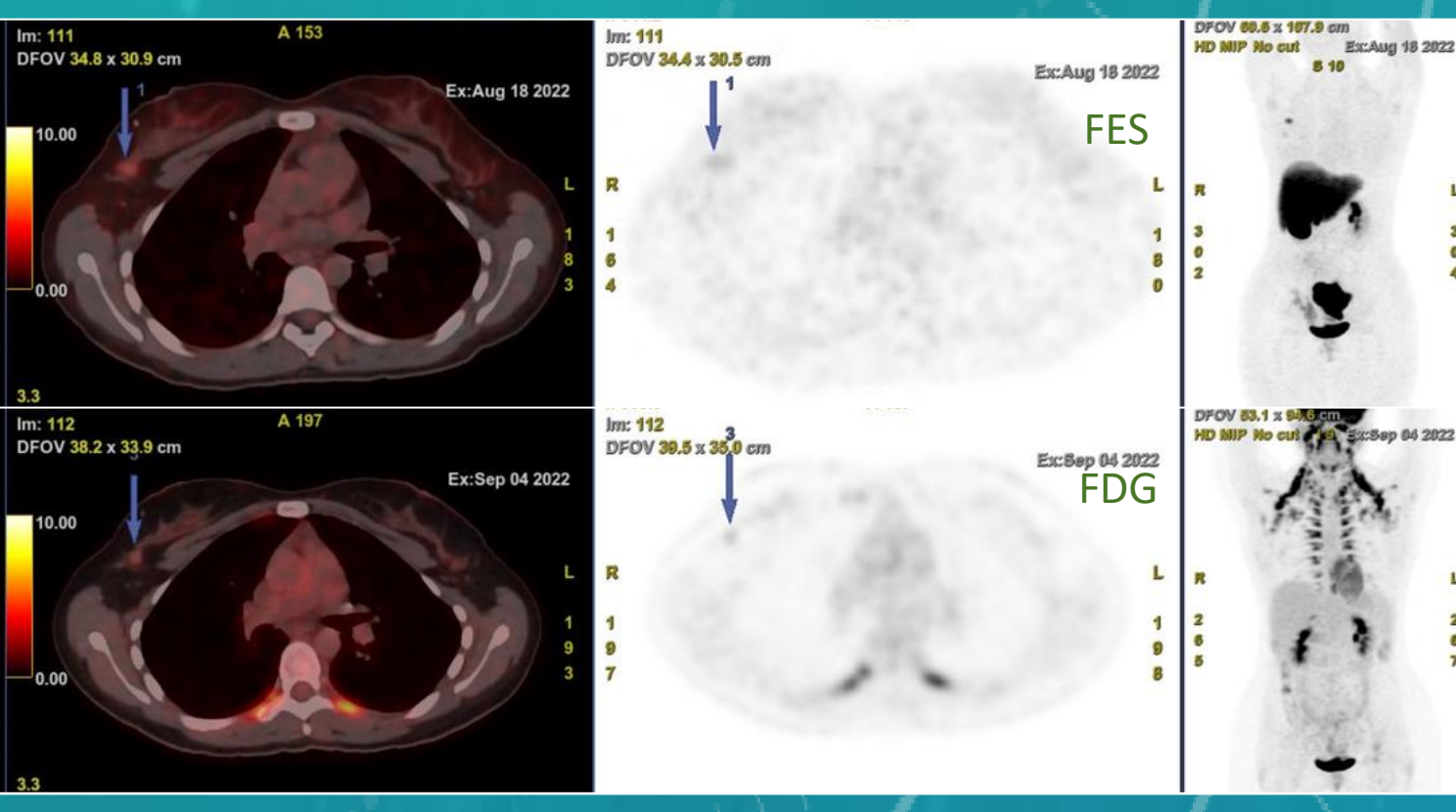


FIG.1 Matching FES/FDG avid lesion at primary site

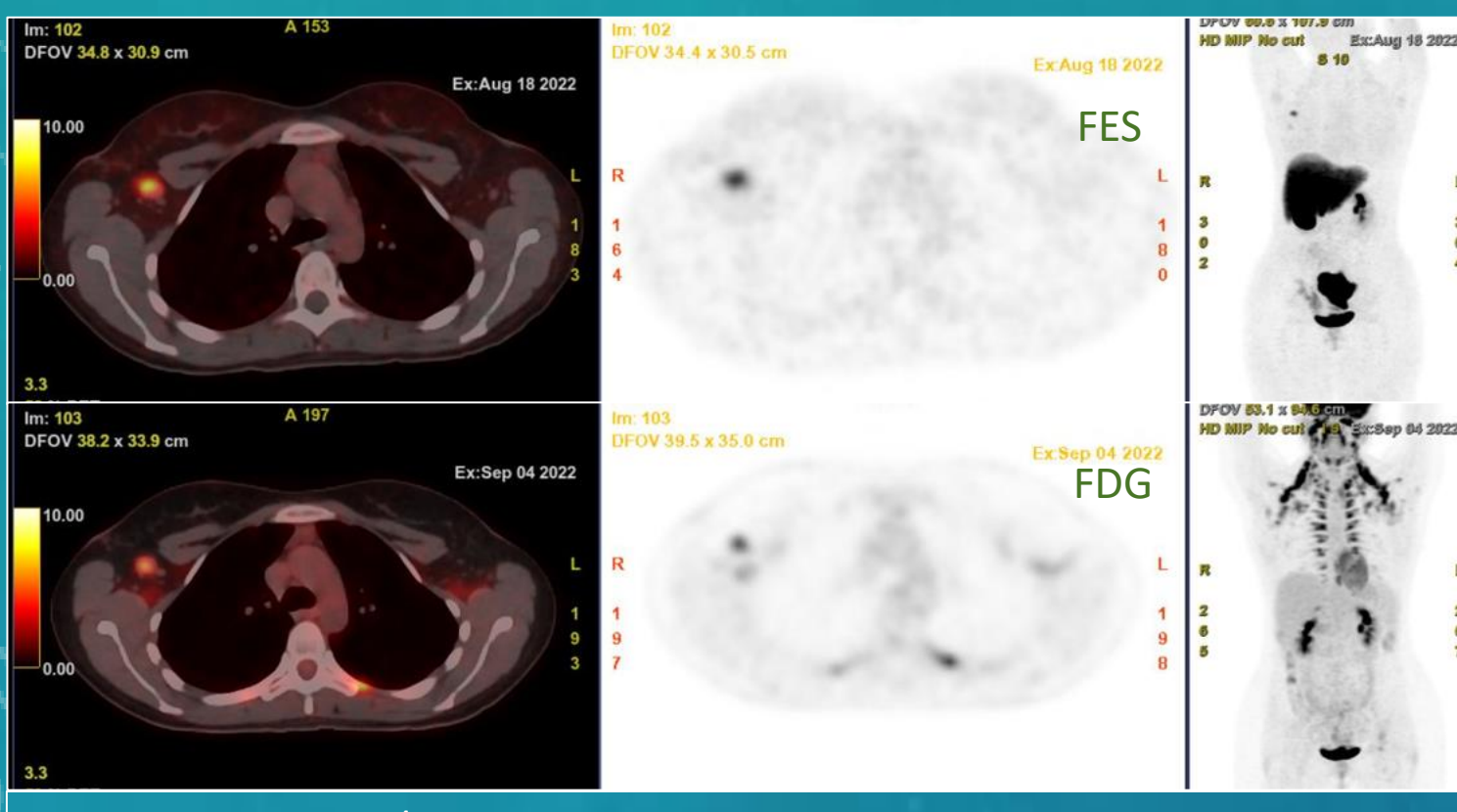


FIG.2 Matching FES/FDG avid lesion at axillary region

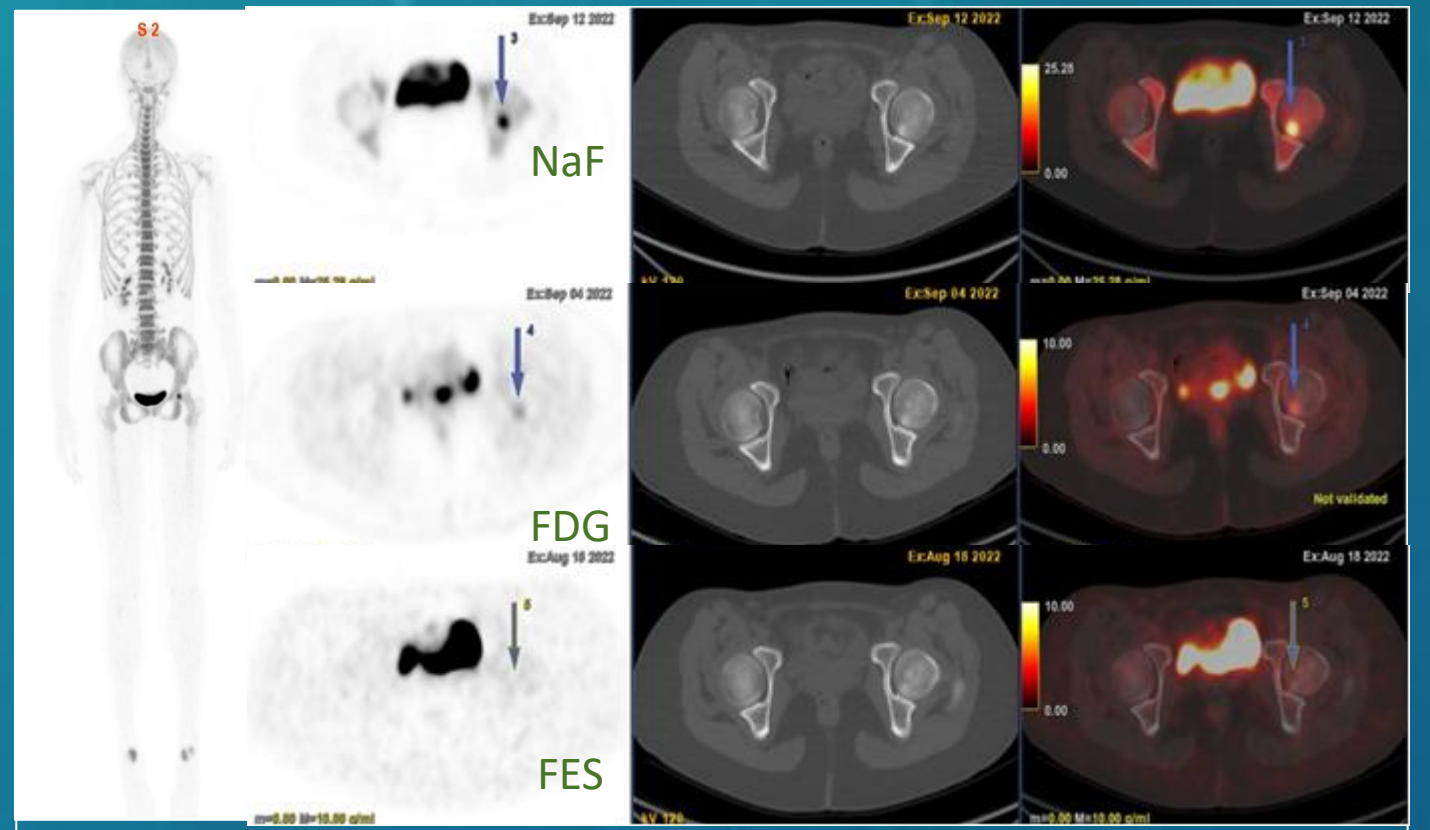


FIG.3 MIS-Matching negative FES/positive FDG and NaF new bone lesion at left femur

Patient refused to change the therapy and on close follow up scans within two months FDG showed a disease progression at the primary site (Fig. 4) (FDG SUVmax raised to 2.45, on further follow up scans to 7.5), axillary lymph nodes became multiple (fig.5a, 5b) with (SUVmax 6.58), persistent hypermetabolic bone lesion (fig 6)(FDG SUVmax 4.02) and on NaF scan progression of the lesion in the head of the left femur (fig.7) as well as reactivation of the old metastases (fig.8).

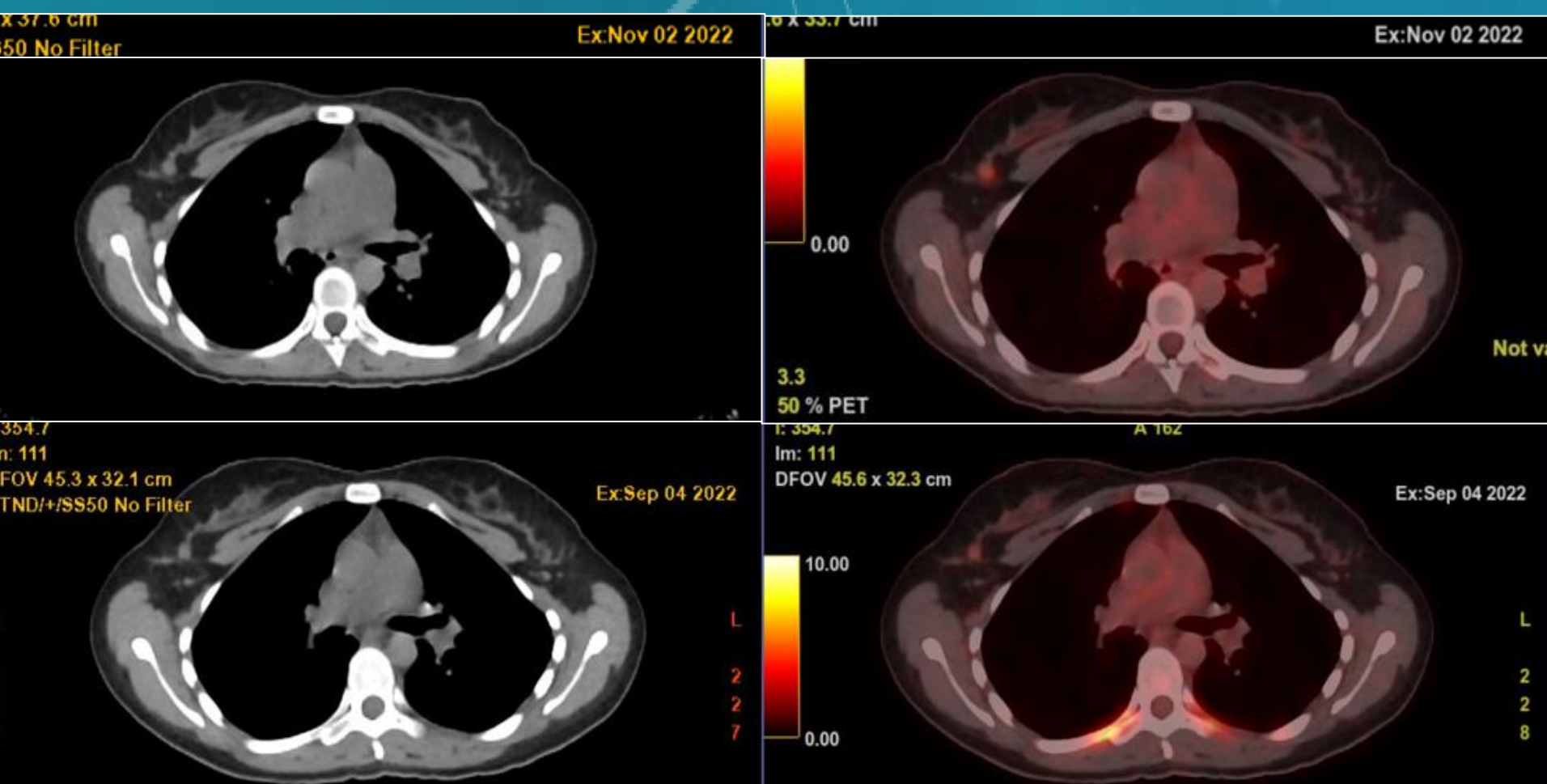


FIG.4 disease progression at primary site on FDG scan after two months

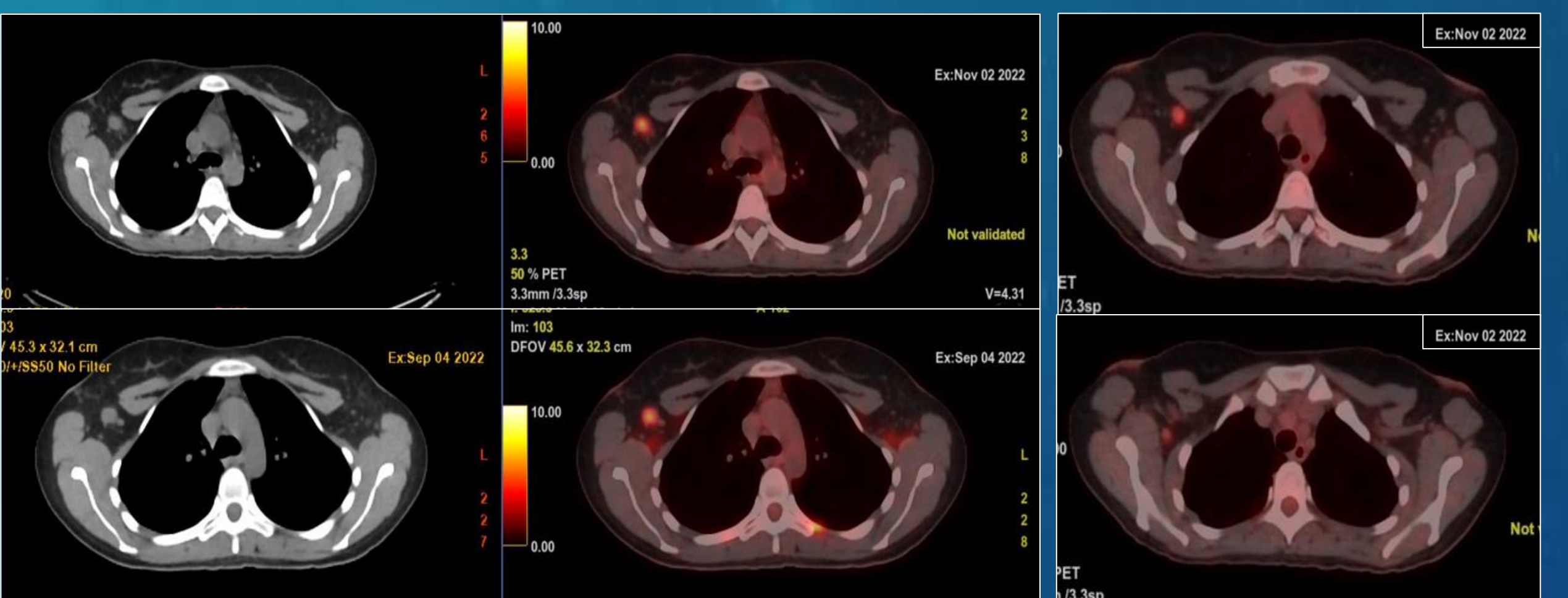


FIG.5 a close follow-up on FDG: new axillary lymph nodes

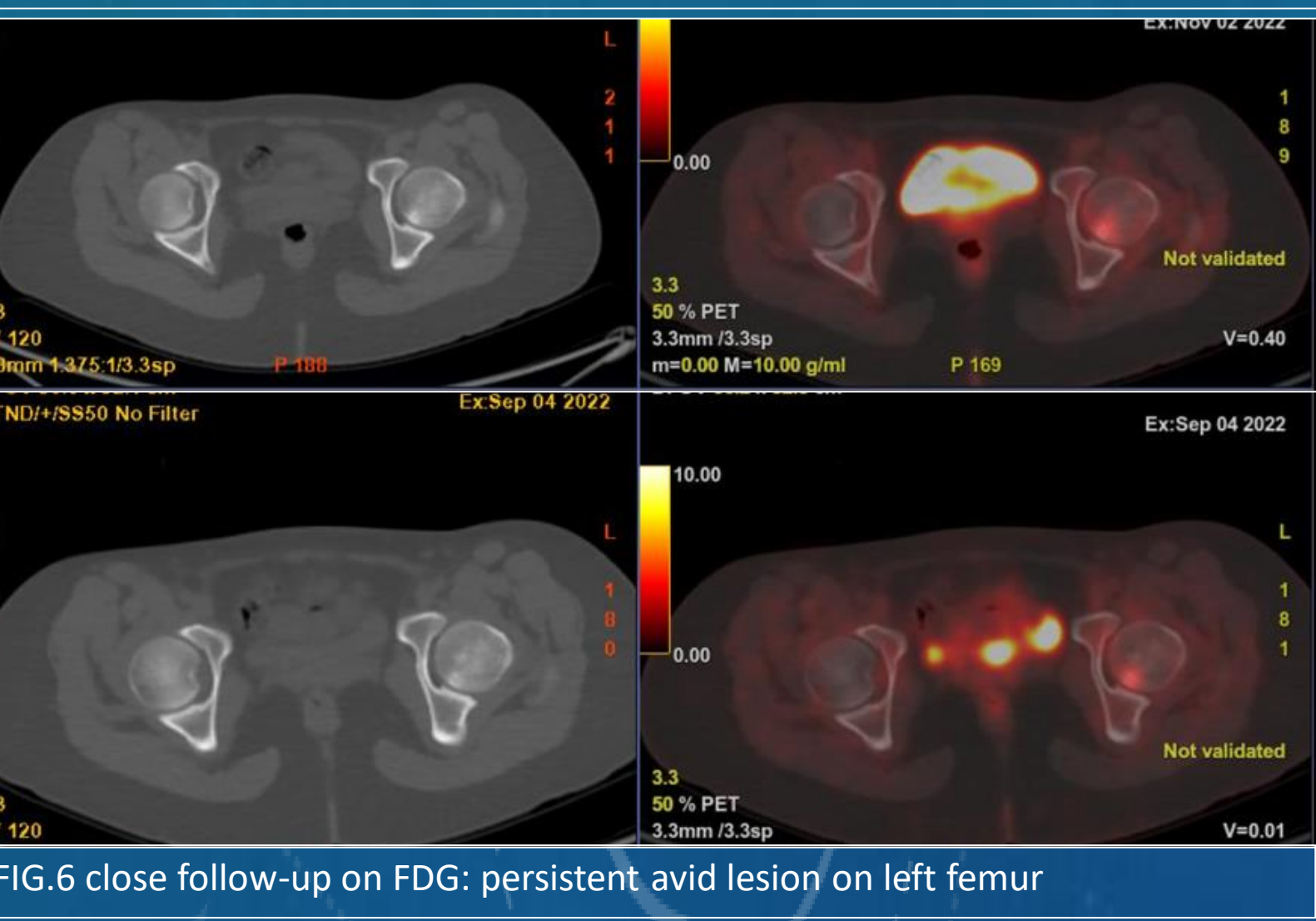


FIG.6 close follow-up on FDG: persistent avid lesion on left femur

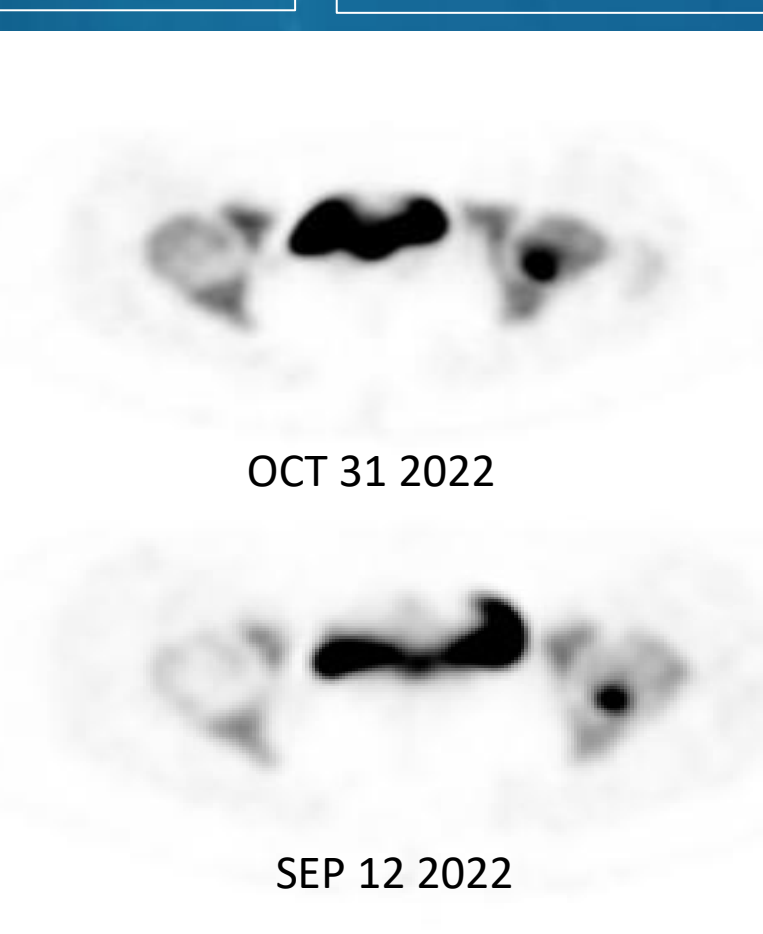


FIG.7 follow-up on NaF: progression on left femur lesion

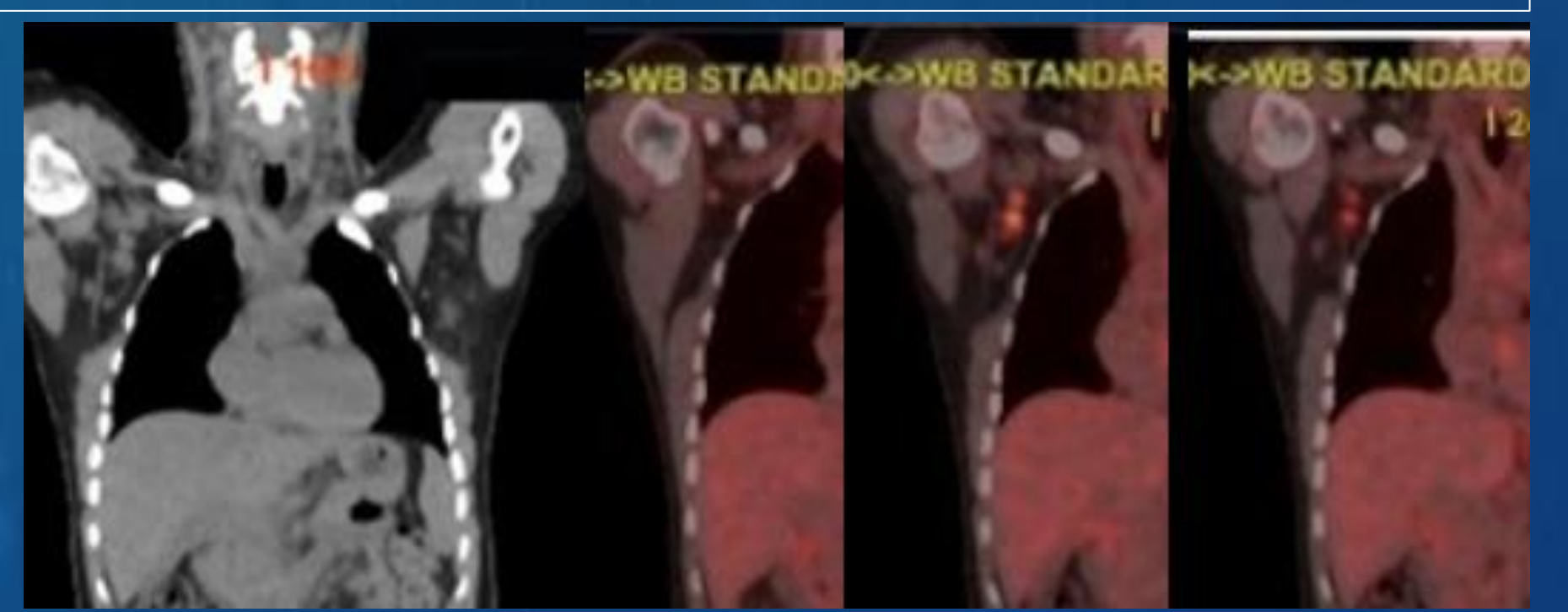


FIG.5 b close follow-up on FDG: multiple new axillary lymph nodes, Nov 02 2022

CONCLUSION:

A single FES-negative/FDG-positive lesion may indicate appearance of early metabolic heterogeneity in metastatic BC and may play role in the prognosis and hormonal treatment response that can help to modify the treatment plan in ER+ BC patients receiving hormonal treatment.

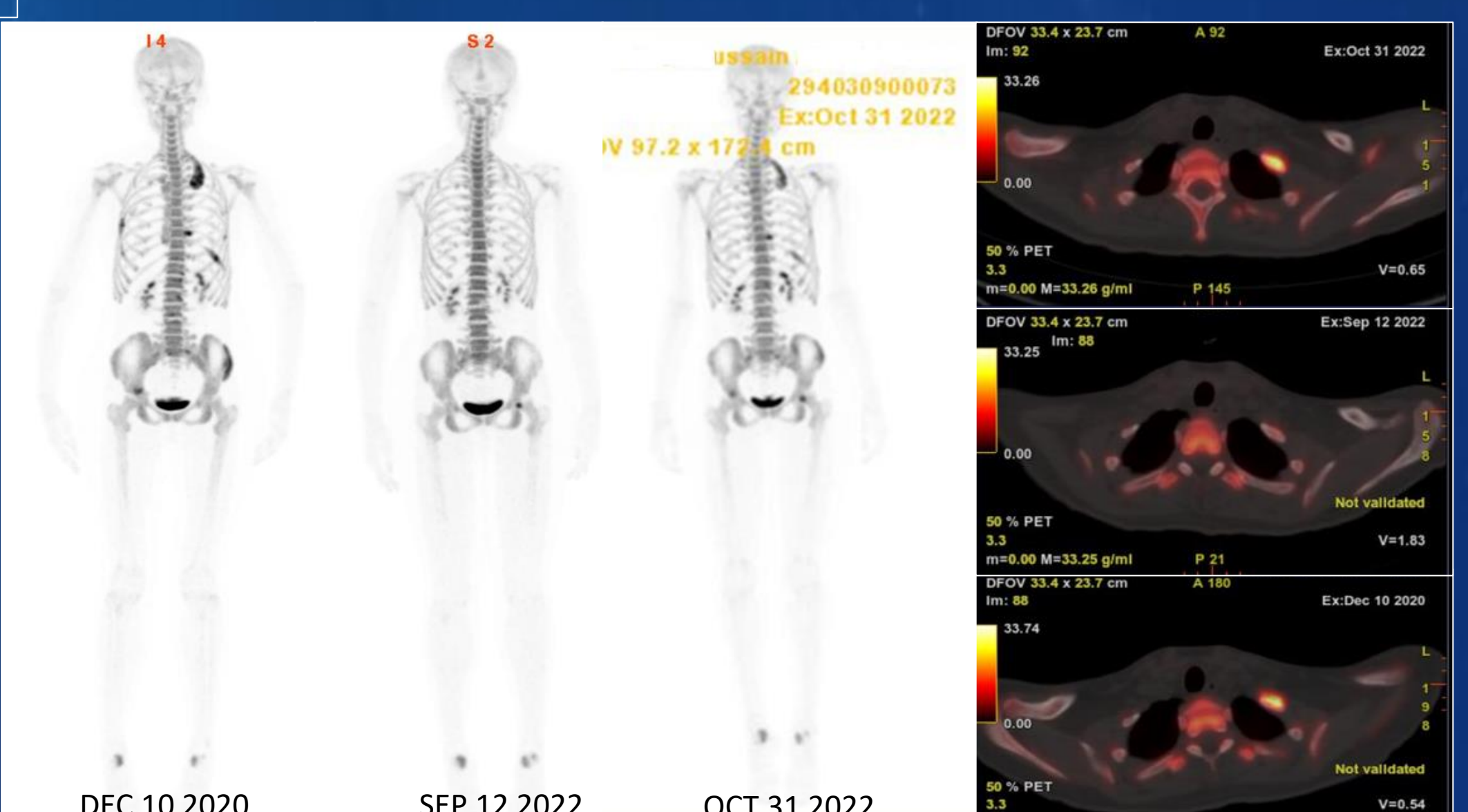


FIG.8 follow-up on NaF: reactivation of old metastasis