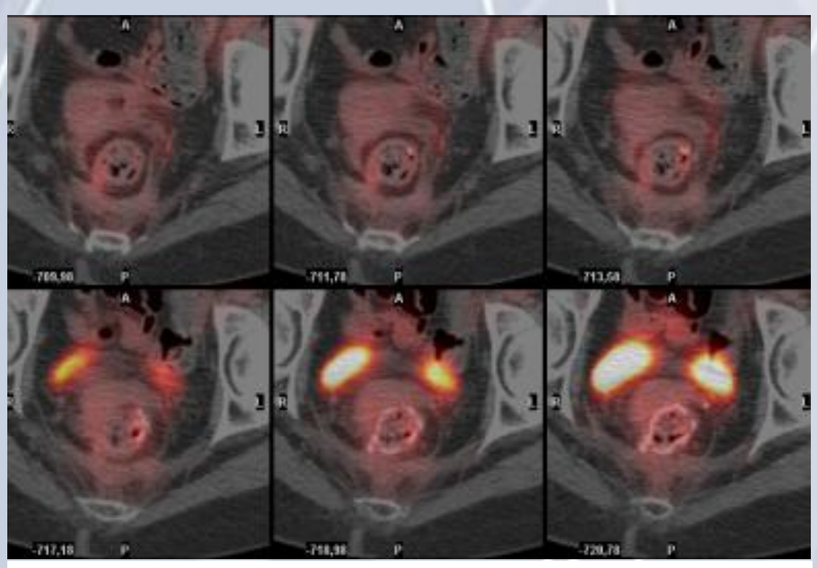
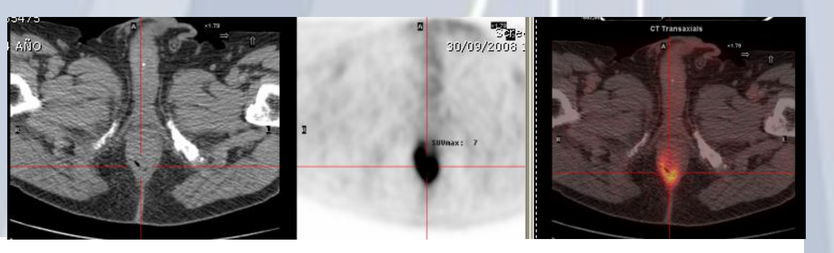
Is the CEA-test of benefit in the interpretation of F18-FDG PET-CT-scans in the postoperative follow-up of rectal cancer ?

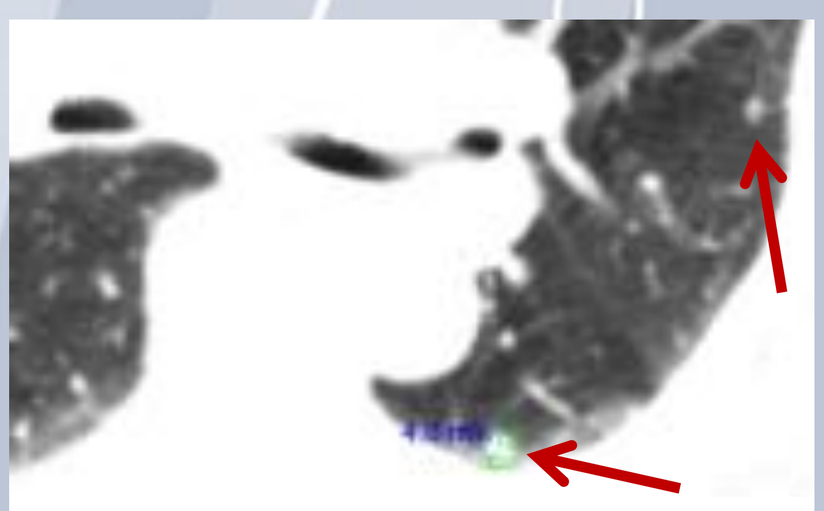
*B.Intriago, M. Danús, C. Trampal *, N. Calvo , E. Rebenaque, L. Millá.*
DIMATGE- CRC- University Hospital Sant Joan . Reus- Spain
**IAT-CRC-Barcelona-Spain.*



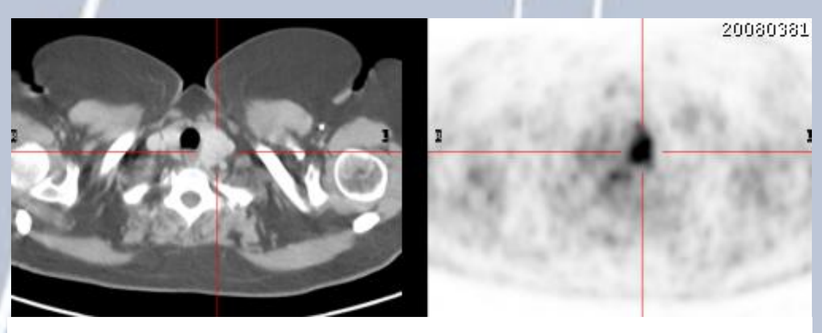
PET-True negative: non pathological FDG uptake on suspected local recurrence with normal CEA levels.



PET-False positive: fibroepithelial polyp , mimicking recurrence. Normal CEA-levels



Pulmonary nodules smaller than 1 cm , without PET-FDG uptake and normal CEA-levels



Medullary thyroid carcinoma , detected as a second primary tumor (increased CEA-levels and no PET-FDG evidence of rectal carcinoma recurrence) .

Objetives:

The aim of this study was to assess whether the carcinoembryonic antigen (CEA)-test may be of benefit in the interpretation of F18-FDG-PET-scans in the postoperative screening for recurrence of rectal cancer and to find out if a particular pattern of association was present.

Methods:

We performed a retrospective study including patients referred to our institution during the last 18 months. The patients underwent a F18-FDG-PET-scan as postoperative screening modality for recurrence of rectal cancer.
All patients presented pathological levels of CEA at the time of first diagnosis and were referred either based on pathological increased CEA serial blood-test or because of suspected recurrence at conventional imaging (CT, RM) or physical examination.
A CEA-test cut-off of 5ng/ml was established. Outcomes were confirmed either through biopsy or based on clinical follow up (minimum 6 months).

Results

42 patients with treated rectal cancer underwent a F18-FDG-PET/CT-scan because of suspected tumor recurrence: 27 cases showed increased CEA levels and 15 normal CEA-test.

F18-FDG-PET-scan showed 3 false positives in patients with normal CEA-test due to granulomatous tissue uptake.
In two cases of positive CEA-test, no recurrence of rectal cancer was found, but in both cases medullary thyroid carcinoma was detected instead at PET-CT-scans.
However, in 6/11 patients, metastatic pulmonary nodules < 1cm were present, without pathological FDG-uptake and with negative CEA-test.

Considering that F18-FDG-PET-CT-scan was able to correctly detect all metastatic pulmonary nodules, even the ones without FDG-uptake (based upon the lowdose-CT images), the overall results for this modality were:

100 % sensitivity, 88% specificity,
90% PPV , 100% NPV
21.4% FP 0% FN, (diagnostic OR 2).

CEA-test showed the following results:
60% sensitivity, 70% specificity,
29% FP, 36% FN, (diagnostic OR 1.47).

CONCLUSIONS:

Despite the small sample, this study discloses the potential benefit of CEA-test as an additional diagnostic tool in the interpretation of F18-FDG-PET-CT-scans in the surveillance of rectal cancer:

- ***CEA-test seems not to be altered in PET-CT-scans depicting areas of granulomatous disease mimicking recurrence.***
- ***CEA-test combined to PET/CT studies may be helpful in disclosing unexpected primary tumors.***
- ***CEA-test resulted negative in cases of pulmonary metastatic nodules <1cm.***