The Value of PET Scan in the Routine Follow-up of Patients with Squamous Cell Carcinoma of the Head and Neck

Yasir Rudha, MD; Amr Aref, MD; Paul Chuba, MD; Kevin O’Brien, MD
Departments of Radiation Oncology, St. John Hospital and Medical Center and St. John Macomb/Oakland Hospital

- PET scan (Positron Emission Tomography) is a relatively new test. The use of this test in the routine follow-up of patients with head and neck cancer is controversial.

- In most studies, FDG-PET was performed when recurrent disease was clinically suspected. Only a few publications report the value of PET examination at a fixed time interval after the end of treatment.

- PET scan is often ordered in our hospital as a routine surveillance tool following successful completion of treatment.

Objectives:
  - To evaluate the utility of PET/CT in the routine follow-up of patients treated for squamous cell carcinoma of the head and neck.

Methods:
  - Cases of head and neck cancer (n=234) treated with chemoradiation between 2006 and 2010 and having post-therapy PET/CT scan were identified as part of an IRB approved study.
  - Retrospective chart review was performed for cases achieving clinical no-evidence-of-disease (NED) status at the time of the imaging (n=45).
  - Positive findings indicated on PET/CT were correlated with ensuing pathology findings and/or other radiological studies.
  - Cases were then coded as true positive or false positive depending on the result of further clarifying tests.
Results

- Post-therapy PET/CT identified 15 patients with abnormality requiring further evaluation.
- Of these, eight cases (53%) were proven to have malignancy based on biopsy findings.
- Six out of 8 cases showed occult persistent disease at the primary site.
- One additional case was diagnosed with regional lymph node recurrence.
- And in one case a colon cancer was identified.
- All patients who had negative PET/CT scan remained free from local-regional relapse at the time of last follow up.
- In the remaining seven cases, imaging findings were shown to represent false positive results with unnecessary work-up and/or biopsy evaluation.
- Hence for this population the true positive rate for routine PET/CT surveillance in head and neck cancer patients is estimated as $8/15 = 53\%$ and the false positive rate as $7/15 = 46\%$.

**Patient with Squamous Cell Carcinoma of Head and Neck**

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Treatment

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NED in 1st Follow-up visit

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Routine PET/CT scan

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Results

- 66% No effect on the plan of management
- 34% Affect the plan of management
  - 53.3% True Positive
  - 46.7% False Positive
Conclusions

- The routine use of PET/CT scan in the follow up of patients with squamous cell carcinoma of the head and neck may be useful for the detection of local-regional recurrences before they become clinically apparent. This in turn may improve the outcome of salvage therapy.

- The routine use of PET scan however is associated with a high false positive rate. This should be considered when ordering radiological exams and biopsies.

- A negative post therapy PET scan appears to be an excellent predictor of freedom from future loco-regional recurrence.

This study can impact the care of patients as:
This result provides a further support for the routine use of PET scan as a surveillance method following treatment of head and neck cancer patient.