Gallium-67 Citrate in a Patient with Fever of Unknown Origin

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• 25-year old male
• Clinical background: intermittent fever in the preceding 4 months, non quantitated weight loss and night sweats.
• Physical examination was unremarkable, except for hepatosplenomegaly.
• Initial lab test results: microcytic hypochromic anaemia (otherwise unremarkable).
• CT scan: bilaterally enlarged neck lymph nodes.
• Neck lymph node biopsy: negative.
Thorax CT: multiple enlarged lymph nodes in aortopulmonary window and azygoesophageal recess.

Right paratracheal, prevascular, and subcarinal lymph nodes are also enlarged.
Gallium-67 citrate planar whole body scan imaging at 48 hours post injection. The right paratracheal mass is moderately avid. There is faint uptake in the upper left paratracheal lymph nodes. The gallium scan results are clearly less impressive than the CT scan results but they have pointed out the most active lesions.
Axial and sagittal slices clearly depict the most active lymph nodes in the right interlobar group (*yellow arrowhead*), in the aortopulmonar window (*white arrowhead*) and in the left bronchopulmonary window (*orange arrowhead*). The massive upper paratracheal and prevascular lymph nodes are surprisingly cold (*green arrowheads*).
Coronal images show the most active paratracheal lymph nodes bilaterally and the right interlobar region. Surprisingly, previously unsuspected retroperitoneal lymph node involvement is disclosed.

A right interlobar lymph node biopsy sample was obtained through video-assisted thoracoscopy. Hodgkin’s disease of the nodular sclerosing subtype was diagnosed.
Discussion

Fever of unknown origin (FUO) often is defined as a fever greater than 38.3°C on several occasions during at least 3 weeks with uncertain diagnosis after a number of obligatory tests.

Approximately 20% of all cases of FUO are caused by occult malignant disease, particularly lymphoma. Therefore scintigraphy with gallium-67 citrate can be a procedure of choice wherever PET CT is unavailable.
Discussion

Although not many studies are performed in well-defined groups of patients with FUO, gallium-67 citrate scintigraphy has been the gold standard for radionuclide imaging in patients with FUO because it is able to detect both acute and chronic inflammatory conditions and some neoplasms.

Approximately 90% of Hodgkin lymphomas are gallium-avid before starting chemotherapy.

Gallium-67 citrate scintigraphy has 85% sensitivity and 90% specificity for the detection of Hodgkin’s lymphoma. SPECT can increase sensitivity up to 90%, particularly for mediastinal involvement.
Teaching Points

• There is a role for scintigraphy with gallium-67 citrate in patients with FUO, particularly if PET CT is unavailable.

• High quality images should be obtained: SPECT is mandatory.

• A positive gallium-67 scan can serve as guidance for the diagnostic biopsy as it will point out the most active lesions.
Teaching Points (II)

- SPECT CT obtained with hybrid gamma cameras or by software fusion imaging can be useful for better lesion targeting.

- Gallium-67 citrate allows upfront whole body scanning which is useful, particularly in patients with lymphoma.

- This case illustrates the concept of tumor heterogeneity where certain tumor areas disclose different levels of gallium-67 avidity.
References


