

What can and what cannot be accomplished with PET: clarifying ongoing misconceptions

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Background: The introduction of 2-deoxy-2-[¹⁸F]fluoro-D-glucose (FDG) in 1976 as a joint effort of the University of Pennsylvania and Brookhaven National Laboratory opened new perspectives in medical imaging. Although FDG PET/CT has become a unique cornerstone of molecular imaging and one of the most widely used imaging modalities, familiarity with its limitations is of paramount importance for avoiding unnecessary examinations.

Content: FDG PET and PET/CT are now widely used in many oncologic diseases for tumor staging/re-staging and monitoring of disease activity as well as for evaluating the response to administered therapy. However, FDG is a nonspecific tracer and can also accumulate at the sites of many benign processes. Even though dual time-point imaging of FDG PET may be helpful in differentiating malignant from benign processes, exceptions exist, and some authors have even demonstrated significant overlap of FDG uptake patterns in malignant and benign lesions. A variety of other PET radiopharmaceuticals such as FLT, ⁶⁰Cu-ATSM, ¹⁸F-EF5, ¹⁸F-FMISO, FIAU, FHBG, FHPG, ¹¹C-Acetate, ¹⁸F-Fuoride, ^{94m}Tc-MIBI, ¹⁸F or ¹¹C -labeled Choline are increasingly being used in various disorders and their area of clinical applications is expanding. In this context, the lecture is also approaching various controversial domains such as PET applications for imaging islets in pancreas, detecting plaques and tangles in Alzheimer's disease or bacteria at sites of infection. Last, but not least, the presentation provides a brief summary related to novel quantitative techniques such as partial volume correction and global disease assessment.

Conclusion: At the end of the lecture attendees would expand their knowledge about what can and what cannot be accomplished with FDG PET/CT imaging.

Key words: Positron emission tomography, fluorodeoxyglucose, FDG PET/CT limitations.

Imaging of the acute female pelvis

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Background: Female patients with acute abdomino/pelvic symptoms are a relatively common problem in the Emergency Department. The diagnostic approach to them is based first on clinical ground (which symptoms, which age), then on lab tests (especially a serum beta-hCG assessment) and imaging.

Content: Ultrasound (US) is the preferred imaging technique when clinical findings suggest an acute pelvic condition; however, symptoms are not always specific and also computed tomography (CT) and magnetic resonance imaging (MRI) are frequently employed. Although, ideally, imaging examinations should be performed with full knowledge of both clinical and laboratory situation, this is not always the case, since some lab tests are time-consuming and emergency studies have to be performed before knowing their results.

Conclusion: A large variety of conditions may cause acute pelvic symptoms but the most common and "dangerous" ones are adnexal torsion, pelvic inflammatory disease (PID) and ectopic pregnancy. This presentation will describe the imaging findings observed in them and will underline the need for integration of clinical information with imaging findings to reach the correct diagnosis.

Key words: acute pelvic symptoms, imaging examinations, female pelvis.

Non-traumatic brain injuries

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Background: Non-traumatic brain injuries consist of many diverse pathologies of the brain and need urgent diagnosis and treatment. Non-traumatic brain injuries include vascular and non-vascular conditions like stroke, spontaneous intracranial hemorrhage, infections, tumors, intoxications, etc.

Content: The aim of this presentation is to give information about common pathologies of non-traumatic brain injuries and imaging findings how to diagnose them correctly, thus enabling the appropriate treatment. The roles of different imaging modalities will be discussed and emphasized.

Key words: non-traumatic brain injuries, spontaneous intracranial hemorrhage, brain infections, brain tumors, brain imaging modalities.