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New nuclear medicine diagnostic method for parathyroid

FROM THE SPECIALTIES

NADIDE MUTLUKOCA STERN*

naster@ous-hf.no
Nadide Mutlukoca Stern, specialist in radiology and nuclear medicine, and senior consultant at the Department of Nuclear Medicine, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

KRISTINE AMLIE*

kkraml@ous-hf.no
Kristine Amlie, specialist in nuclear medicine, economist and senior consultant at the Department of Nuclear Medicine, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

ALEXANDER GUL SHERWANI

Alexander Gul Sherwani, radiographer specialising in PET/CT at the Department of Nuclear Medicine, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

MARIA STAVRINOU

Maria Stavrinou, MSc, PhD, medical physicist at the Department of Physics and Image Analysis, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

CHARLOTTE ELDJARN

Charlotte Eldjarn, specialist in nuclear medicine and senior consultant at the Department of Nuclear Medicine, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

JOEL OLSSON

Joel Olsson, specialty registrar at the Department of Nuclear Medicine, Oslo University Hospital, Rikshospitalet.
The author has completed the ICMJE form and declares no conflicts of interest.

* Nadide Mutlukoca Stern and Kristine Amlie contributed equally to this article.

18F-choline PET/CT is an imaging technique used to localise hyperfunctioning parathyroid tissue and parathyroid adenomas.

Imaging with methoxyisobutylisonitrile or tetrofosmin scintigraphy supplemented with thyroid scintigraphy with technetium pertechnetate has been used in standard parathyroid imaging in nuclear medicine. The indication is elevated levels of ionised calcium and parathyroid hormone (PTH) in the serum, which raise suspicion for adenoma. The treatment is often surgical removal of any parathyroid adenoma. Precise anatomical localisation of important surrounding structures is therefore vital (1).

18F-choline PET/CT for parathyroid scintigraphy

18F-choline PET/CT is a relatively new imaging technique used to localise hyperfunctioning parathyroid tissue and adenomas. The technique is gradually being adopted worldwide, and in our experience, its utilisation has increased in Norway (2). Initially, the technique was only used in cases where precise localisation was difficult with conventional imaging. The method has given excellent results, leading to the gradual phasing out of conventional nuclear medicine methods (3).

Advantages of 18F-choline PET/CT include lower radiation exposure to patients, reduced uptake time, total duration reduced to around half an hour, higher diagnostic precision due to higher resolution, and more time for other investigations (4). Conventional imaging takes around four hours. Additionally, the quality of diagnostic CT scans from PET/CT scintigraphy is superior to that of the SPECT/CT cameras, giving better image quality in an area with many small anatomical structures (3). Diagnostic CT can be used in three phases, i.e. unenhanced phase, arterial phase and portal venous phase, which is highly

valued by our endocrine surgeons. However, it is entirely possible to use only unenhanced phase, either with a standard dose or low dose for anatomical localisation in selected cases. In our experience, the radiation doses in PET differ from those in conventional imaging: the radiation dose in PET is a third of that in conventional imaging, with 3 mSv and 10 mSv, respectively.

A simple method that should be used more

The diagnostic accuracy of 18F-choline PET/CT has been better in practice than expected. It is time-saving for radiographers, bioengineers, doctors and, not least, patients. We believe that it has the potential to become the standard in the investigation of parathyroid adenomas. The socio-economic benefits of the radiopharmaceutical outweigh the high cost: reduced waiting time for other examinations, higher surgical precision, shorter time from examination to completed treatment, lower radiation exposure to the patient, and reduced need for supplementary imaging diagnostics.

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