

Cod: PO166

ACQUISIZIONE 3D VERSUS 2D IN PET/TC

L. Frontino¹, F. Santarelli¹, S. Varchetta¹, L. Travascio¹

¹*Medicina Nucleare Policlinico Universitario Tor Vergata Rome, Italy*

BACKGROUND-AIM

Scope of work is to compare the performance of PET / CT 3D (64 layers) to the PET / CT scan 2D (16 layers) in terms of diagnostic accuracy, acquisition times and doses absorbed by the patient and operator.

METHODS

All Pz. Were fasted for at least 6 hours, none of which were diabetic. Blood sugar measured before administration of fluorodeoxyglucose (F18FDG) was <150 mg / dL. Based also on the sensitivity provided by GE Healthcare (Discovery ST (2D) 2.0 cps / kBq - PET Discovery VCT (3D) 8.5 cps / kBq), the dose of FDG was administered respectively of 4.4 MBq / kg and 2, 9 MBq / kg.

In all Pz included in the study, the acquisition times were significantly reduced in 3D acquisitions (2,5min / bed in 3D, 3.5 min / bed in 2D), while maintaining an adequate counting statistics. As a result of improved efficiency 3D acquisition, the 10 Pz could receive a dose of FDG reduced compared to the standard used in 2D mode, resulting in less irradiation of the staff employed in the tourist PET / CT. Finally, the diagnostic accuracy was not affected neither by the lower dose administered either by the fact of having reduced the duration of the acquisition, since the lesions found in 3D with size > 1 cm are found to be well characterizable both from the visual point of view ("visual analysis") that semiquantitative (SUVmax).

RESULTS

Determine the relative advantage of the use of 3D mode with respect to the 2D remains complex, although the first lead to a potential increase of sensitivity to the "true events" by a factor 5. However, in clinical practice, are increased also the "random" and "scatter events" and downtime, reducing the actual sensitivity of the scanner. For the moment, the use of a dedicated algorithm can compensate for the routine use of crystals with better energy resolution and temporal, as the LSO, not yet available on a large scale.

The advantages of reduced acquisition times PET in 3D, which does not appear to reduce the accuracy of the survey, are varied. A first consequence is represented by the lower radiation suffered by staff operating within the PET and the patients themselves. Furthermore, the increased availability of the radiopharmaceutical, by consensus to reduce the time of execution of the examination, could allow to implement daily activities, with benefit to waiting lists.

CONCLUSION

Finally, given the possibility of a respiratory gating with 4D tomography PET / CT of the latest generation (64 layers), one can envisage the use in cardiology for the study of cardiac function, in radiotherapy for the irradiation of target volumes reduced.