

Positioning and Immobilization of Lung Cancer Patients

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Today the PET/CT scan used for contouring of tumors is a well-established method and a valuable help for the target definition and for planning of the radiation treatment. It is of outmost importance when performing a diagnostic PET/CT scan, that the patient lies still for the entire study. This requires that the patient is positioned as comfortable as possible and is well stabilized. A PET/CT scanning session, even with a modern scanner, will typically take at least 12 – 15 minutes. The PET/CT scan can only be used for precise tumor delineation and planning of the radiation therapy, on condition that the patient lies identically at the scanning session, as at the treatment session.

Modern radiotherapy offers today sophisticated treatment options, like for example IMRT = Intensity Modulated Radiation Therapy, dose painting, stereotactic technic and VMAT= Volumetric Modulated Arc Therapy. These techniques give the opportunity to tailor the target areas with small margins and thus reduce the dose to radiosensitive organs. Radiation therapy is often delivered in many fractions, or alternatively in few fractions with a high dose (stereotactic technic).

The planning of a lung cancer patient can be a great challenge, depending on the motion from breathing and internal motion from the cardiac. The patient is typically scanned in a quiet breathing, and this motion can lead to mismatch between the PET and the CT in the attenuation correction. The images can be blurred and this can complicate the delineation.

For the nuclear medicine technologist, it is usually a new area of competence to work with PET/CT for the radiotherapy purpose. It is therefore important to have a close cooperation with the staff from the Radiotherapy Department, and together contribute with each skills. The preparations, the positioning and for example the skin marks, causes that a therapy PET/CT scan takes longer time to prepare and the staff will be exposed for more radiation. Therefore it is important that all involved staff have some basic knowledge of positioning and immobilization.

This talk will give some examples of consideration's and challenges regarding positioning, and how we achieve a good and identical positioning of the patient at the scan and at the treatment session. The talk is based on the chapter "Practical positioning and immobilization", in The book; PET/CT – part 3 PET/CT Radiotherapy planning. Published by the EANM Technologist Committee.

References

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