

ESTRO MOBILITY GRANT (TTG) REPORT

Title of the report: INRT in Hodgkin Lymphoma using DIBH PET

HOST INSTITUTE:

University Hospital Copenhagen - Rigshospitalet, Denmark

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The ESTRO mobility grant gave me the opportunity to visit Rigshospitalet where I study and learn the finer aspects of PET-simulation in deep inspiration breath hold technique (DIBH) for early stage Hodgkin lymphoma. Under the guidance of Pr Lena Specht, expert in the field of modern radiation oncology for Hodgkin Lymphoma, I follow the different steps of treatment planning from image acquisitions to treatment.

The guidelines for modern and highly conformal radiation for early Hodgkin lymphoma support the concept of involved-node radiotherapy (INRT) and they recommend, whenever possible, the acquisition of initial imaging in treatment position as this allows a very accurate definition of the target volume ¹. Positron emission tomography (PET) plays a major role for staging and response assessment, whenever available is recommended as a diagnostic tool ² and therefore could play a major role for optimal planning radiotherapy.

Rigshospitalet is equipped with 6 PET-CT and for each one a breathing control system is available, allowing PET/CT-simulation in DIBH to be performed systematically when there is mediastinal involvement.

With the help of Dr Anne Kiil Berthelsen I was able to understand the steps to follow for the acquisition of FDG-PET/CT images in treatment position and the importance of motion control for mediastinal lymphoma. As the FDG uptake in Hodgkin lymphoma may be variable, performing a PET-CT in DIBH reduces inhomogeneity of the FDG-uptake due to motion artifacts and CT *anatomy of the mediastinal structures* are narrowed³, as shown in Fig 1.

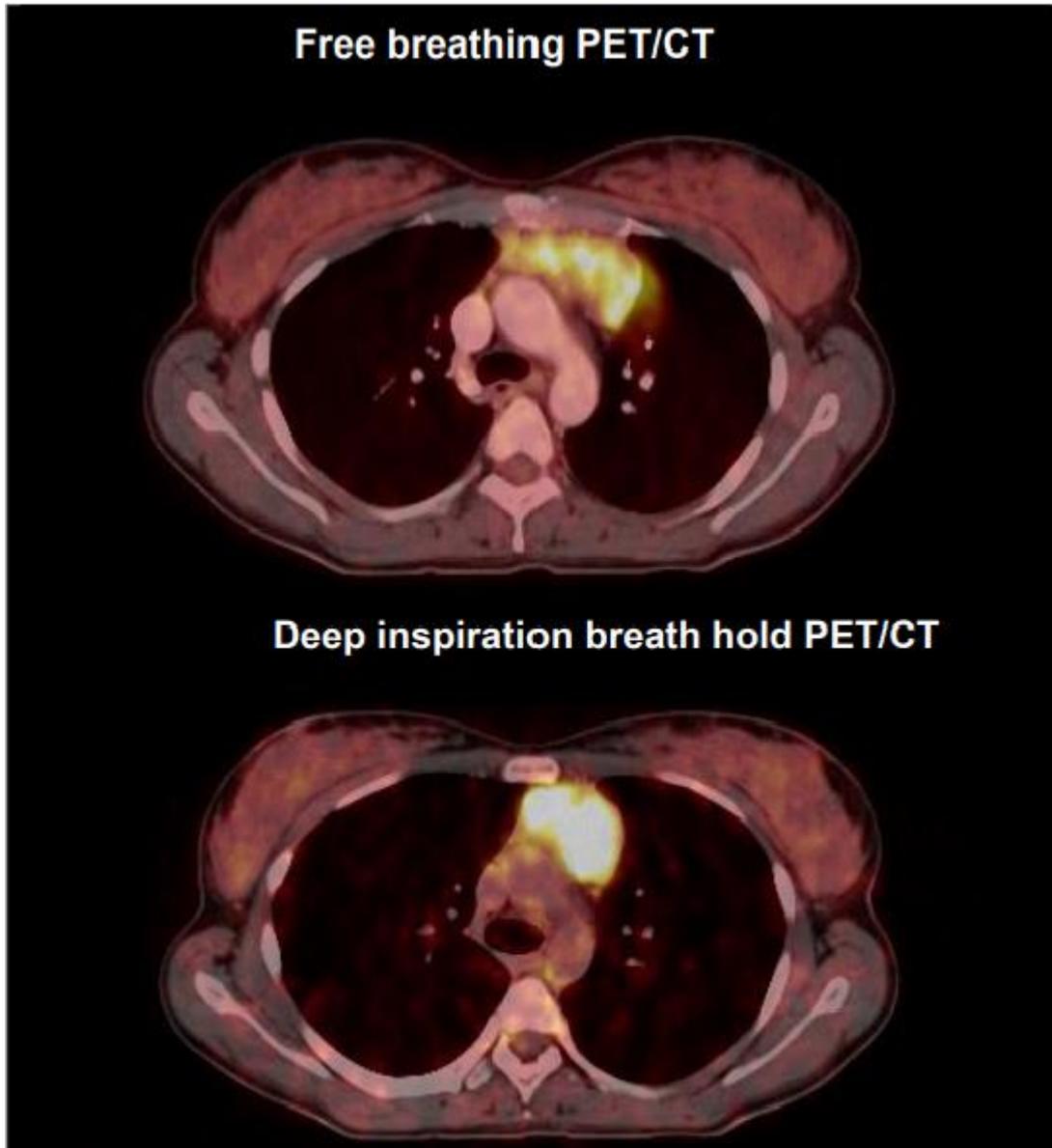


Fig 1. PET/CT scan of a patient with mediastinal lymphoma. In DIBH, the lymphoma is narrower and more homogeneous with respect to FDG uptake (courtesy of Pr Lena Specht and Dr. Anne Kiil Berthelsen)

Furthermore, for defining the target volume I observed a very close collaboration between nuclear medicine physicians, radiologists and radiation oncologists, which is extremely helpful to avoid unnecessary irradiation.

Treatment planning, delivery and position verification in DIBH was discussed with the physicist Mirjana Josipovic; a clear dosimetric benefit was observed, even when using volumetric modulated arc therapy (VMAT) or intensity modulated radiation therapy (IMRT).

Nevertheless, I really appreciated attending departmental meetings, where we discussed dosimetric issues, spending quality time with nuclear medicine physicians, observed the technique used for total body irradiation and the different immobilization devices used in the radiotherapy department, exchange knowledge on complex aspects of radiotherapy in hematological malignancy.

I'm very grateful to all staff members at Rigshospitalet (a special thanks to Pr Specht and Dr Kiil Berthelsen) for their hospitality and willingness to share their knowledge with me; I'm also grateful to the ESTRO committee (especially to Viviane Van Egten) for this great experience, which will help me implement PET/CT in DIBH in my institution. Thanks to everyone who made this experience possible.

Bibliography

1. Specht, L. *et al.* Modern radiation therapy for Hodgkin lymphoma: Field and dose guidelines from the international lymphoma radiation oncology group (ILROG). *Int. J. Radiat. Oncol. Biol. Phys.* **89**, 854–862 (2014).
2. Eichenauer, D. A. *et al.* Hodgkin's lymphoma: ESMO clinical practice guidelines for diagnosis, treatment and follow-up. *Ann. Oncol.* **25**, iii70-iii75 (2014).
3. Specht, L. & Berthelsen, A. K. PET/CT in Radiation Therapy Planning. *Semin. Nucl. Med.* **48**, 67–75 (2018).