Magnetic resonance imaging for staging lymphoma: whole-body or less?

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Introduction

The lymphomas comprise approximately 5% to 6% of all malignancies and are the fifth most frequently occurring type of cancer in the Western World (1). Once a lymphoma has been diagnosed histologically, extent of disease has to be assessed, because this determines prognosis and treatment planning (2, 3). Whole-body MRI may be a valuable staging alternative to CT (4) and possibly FDG-PET/CT (5) as there is no associated risk of ionizing radiation exposure. CT is usually performed from the head to the groins (excluding the arms), whereas whole-body MRI refers to MRI of the area from the cranial vertex to the toes (including the arms) (Figure 1). However, it is unknown whether a whole-body MRI protocol is necessary, or whether an MRI protocol that only has the usual CT coverage (i.e. from cranial vertex to groins) is comparable while less time-consuming. The aim of this prospective study was therefore to assess whether MRI of the entire body (whole-body MRI) detects more clinically relevant lesions than an MRI protocol that only includes the head/neck and trunk in patients with lymphoma.

Subjects and Methods

One hundred consecutive patients with newly diagnosed lymphoma (Hodgkin lymphoma: n=21; non-Hodgkin lymphoma: n=79) prospectively underwent T1-weighted (T1W) and T2-weighted short inversion time inversion recovery (T2W-STIR) whole-body MRI at 1.5T. A board-certified radiologist with 14 years of clinical experience with MRI evaluated the images. The number of lymphomatous sites at MRI with a field of view (FOV) limited to the head/neck and trunk, and the additional number of lymphomatous sites outside the head/neck and trunk at whole-body MRI were determined. The proportion of patients with lymphomatous lesions outside the head/neck and trunk was calculated, along with binomial exact 95% confidence intervals (CIs), and the number of patients in whom these lesions would change Ann Arbor stage was determined.

Results

At MRI with a FOV limited to the head/neck and trunk, a total of 387 nodal and 120 extranodal sites were classified as lymphomatous. At whole-body MRI, 1 additional nodal and 6 additional extranodal sites were classified as lymphomatous outside the head/neck and trunk, in 7 of 100 patients (7.0%; 95% CI: 3.4-13.8%), but this did not change Ann Arbor stage in any of these patients. Whole-body MRI examples of patients with lymphomatous lesions outside the head/neck and trunk are shown in Figures 2 and 3.

Figure 1. *Coronal T1W whole-body MRI (from cranial vertex to toes, including the arms). The area within the dashed rectangle corresponds to the usual CT coverage for staging lymphoma (i.e. from cranial vertex to groins, excluding the arms).*

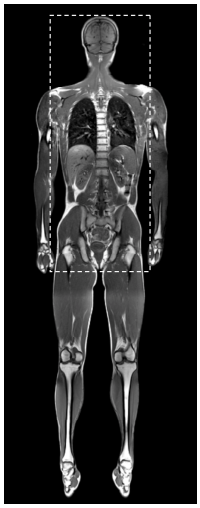


Figure 2. *Coronal T1W (a) and T2W-STIR (b) whole-body MRI in a 71-year-old female with stage IV Waldenström's macroglobulinemia). A left tibial bone marrow lesion is seen (arrows) that would have remained undetected if only the area from the head to the groins would have been imaged. Nevertheless, the presence of this tibial bone marrow lesion does not change Ann Arbor stage in this patient.*

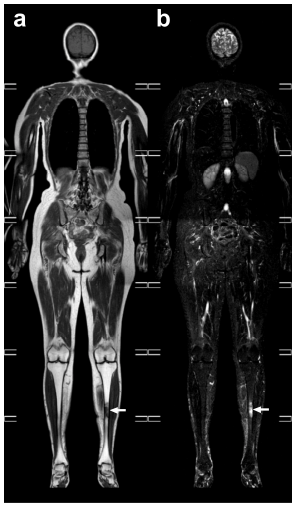
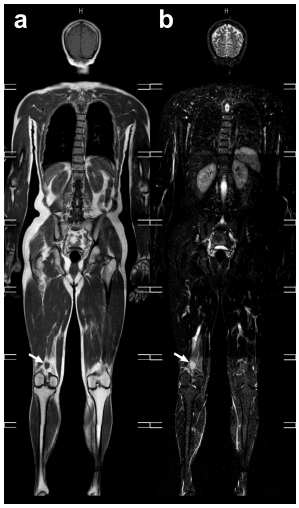


Figure 3. *Coronal T1W (a) and T2W-STIR (b) whole-body MRI in a 55-year-old male with stage II follicular lymphoma. An enlarged right popliteal lymph node is seen (arrows), suggestive of lymphomatous involvement. This lymph node would have remained undetected if only the area from the head to the groins would have been imaged. Nevertheless, the presence of this enlarged popliteal lymph node does not change Ann Arbor stage in this patient.*



Conclusions

Whole-body MRI did not detect any clinically relevant lesions outside the FOV of an MRI protocol that only includes the head/neck and trunk. Therefore, it may be sufficient to only include the head/neck and trunk when using MRI for staging lymphoma.

References

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