Supplementary Material 2: Early therapy response after irradiation

Diffusion weighted imaging in magnetic resonance imaging (MRI) can assess therapy response in multiple myeloma already after a few weeks (e. g. Horger et al., three weeks after therapy) (1,2). To investigate the capabilities of virtual non-calcium (VNCa) imaging to demonstrate early therapy response, we examined the subset of patients with early follow-up dual-energy CT (DECT) after irradiation (<20 weeks, n=14 follow-up DECTs, Supplementary Figure 1).



**Supplementary Figure 1: Subset analysis of patients with early (<20 weeks) follow-up dual-energy CT after irradiation.**

For early follow-up examinations between 6-20 weeks after irradiation, irradiated lesions demonstrated a stronger decrease of attenuation or a less pronounced increase of attenuation after radiotherapy, compared to non-irradiated lesions. Discriminative performance of receiver operating characteristic analysis was excellent for this period (AUC 0.80 [0.65 – 0.94], best threshold 0.5%). Yet, for very early follow-ups during the first six weeks after irradiation, this effect did not demonstrate acceptable performance within our population.

For patients with early follow-up DECT between 6-20 weeks after radiotherapy, irradiated lesions were discriminated excellently by a stronger decrease or a less pronounced increase of attenuation, compared to non-irradiated lesions (AUC 0.80 [0.65 – 0.94], best threshold 0.5%). This finding is in line with the mid- to long-term follow-ups demonstrated in the main document. Very early follow-up DECTs <6 weeks after irradiation were not adequate for discrimination of irradiated and non-irradiated lesions by VNCa measurements; however, we refrain for a final evaluation due to our small sample size (n=4 follow-up examinations / 9 irradiated lesions with follow-up <6 weeks).

**References**

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