**Supplemental figure S1, panel A** Flow chart of patients with suspicion of ICI-related myocarditis as a function of their work up for <sup>68</sup>Ga-DOTATOC PET/CT (A).

**Supplemental figure S1, panel b** Delay between clinical suspicion of ICI-related myocarditis as a function of the time course of the evolution of hs Troponin I levels in patients that had <sup>68</sup>Ga-DOTATOC PET/CT.

**Supplemental figure S2** Pie chart of the percentage of patients with elevated Troponin I, abnormal LVEF, abnormal ECG and abnormal NT-ProBNP among patients who underwent CMR imaging and those who received PET/CT <sup>68</sup>Ga-DOTATOC.

**Supplemental figure S3** ROC analysis curve showing the comparison between MBRpeak calculated on the free wall of patients with ICI-related myocarditis (9 positive cases) and a control group of NET tumors patients (39 negative cases).

**Supplemental figure S4 (A)** Fused <sup>68</sup>Ga -DOTATOC PET/CT images in the coronal plane showing pathological uptake in the paravertebral and intercostal muscles in 5 patients: a (patient 3), b (patient 4), c (patient 6), d (patient 7), e (patient 9); SUV scale 0–2 g/mL.

**Supplemental figure S4 (B)** Fused <sup>68</sup>Ga -DOTATOC PET/CT images in the coronal plane showing pathological uptake in the paravertebral and intercostal muscles in 5 patients: a (patient 3), b (patient 4), c (patient 6), d (patient 7), e (patient 9); SUV scale 0–2 g/mL.(B)<sup>68</sup>Ga - DOTATOC PET/CT images of a 75-year-old male (patient 9) with myocarditis and diffuse myositis (neck, intercostal, paravertebral muscles and pelvic area and a 65-year-old male (patient 11) without myositis; a/e: maximum intensity projection images; b/f: CT in the coronal plane; c/g: fused PET/CT image in the coronal plane; and d/h: PET images in the coronal plane; SUV scale 0–2 g/mL.

**Supplemental figure S5 (A)** ROC analysis curves were generated to evaluate AUC values, sensitivity, specificity, ppv, npv for cytokines of interest. (B)Principal component analysis (PCA) on cytokine markers.

**Supplemental figure S6**  $^{68}$ Ga-DOTATOC fused PET/CT images in the axial plane showing a panel patients with suspicion of ICI-related Myocarditis (a, b and c) and patients with NET tumors (d, e and f); SUV scale 0-2 g/mL.