Subacute Cerebellar Infarction with uptake on 68Ga-PSMA PET/CT

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Abstract: We report a case of subacute cerebellar infarction mimicking metastasis on PSMA PET/CT. A 77-year-old man with prostate cancer treated with androgen deprivation therapy and radiotherapy with rising PSA was referred for 68Ga-PSMA PET/CT. Apart from PSMA expressing tumour of the left prostate, PSMA PET/CT demonstrated radiotracer uptake in the right cerebellar hemisphere. This finding corresponded to a site of sub-acute infarction as shown on an MRI of the brain performed 35 days previously. As cerebellar infarcts are considerably less common than cerebral infarcts, they may not be anticipated as a potential cause for false positive radiotracer uptake on PSMA-PET.

Key Words: PSMA, PET/CT, Cerebral metastasis, ischemic stroke, MRI

FIGURE 1. A 77-year-old man with prostate cancer treated with androgen deprivation therapy and radiotherapy with rising prostate specific antigen was referred for 68Ga- Prostate-specific membrane antigen (PSMA) positron emission tomography/computed tomography (PET/CT). PSMA PET/CT performed 45 mins after intravenous injection of 68Ga-N,N'-bis-[2-hydroxy-5-(carboxyethyl)benzyl]ethylenediamine-N,N'-diacetic acid (HBED-CC) for the investigation for prostate cancer recurrence showed increased PSMA uptake in the left prostate, confirming residual disease (not shown). 68Ga-HBED-CC is an investigational product increasingly being used for the purpose of PET imaging in prostate cancer. (A) PET image of the head showed radiotracer uptake in the right cerebellar hemisphere. (Incidental sub-cutaneous occipital lipoma noted.) (B) No structural abnormality is seen on the corresponding low dose CT. Review of magnetic resonance imaging (MRI) performed 35 days prior to PET showed (C) a T2 fluid-attenuated inversion recovery (FLAIR) hyperintensity in the right cerebellar hemisphere with (D) a corresponding area of high signal on b1000 diffusion weighted imaging (DWI), indicating sub-acute infarction rather than cerebellar metastasis. Visualization of sub-acute cerebellar infarction on PSMA PET/CT may potentially mimic
cerebellar metastasis which have previously been reported to show radiotracer uptake on PSMA-PET [1,2,3]. Although HBED-CC uptake has been reported in acute and subacute cerebral infarcts [4,5], cerebellar infarcts are relatively rare, representing only 2% (range 1.5-2.3%) of all strokes [6,7]. Therefore cerebellar infarcts may be less likely to be anticipated as a potential cause for false positive uptake on PSMA PET. A potential mechanism for HBED-CC uptake in areas of ischemic stroke is increased permeability of the blood brain barrier which has also been proposed as a mechanism for HBED-CC uptake in intracranial metastasis from non-prostate cancer malignancies [8]. However, this hypothesis requires further investigation.

REFERENCES
