^{18}F -FDG PET-CT for Detection of Recurrent Spinal Ependymoma

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Ependymomas are uncommon central nervous system tumors, with the spinal cord being the most common site in adults. Magnetic resonance imaging (MRI) is currently the standard imaging modality for initial diagnosis and to assess the adequacy of surgical resection and/or the response to radiation therapy. However, as in case of brain tumors, post treatment

MRI might not be able to differentiate between radiation necrosis and recurrent tumors. Here we present ^{18}F -fluorodeoxyglucose (FDG) positron emission tomography computed tomography (PET-CT) images of a 40-year-old female with recurrent spinal ependymoma. FDG PET-CT showed recurrent tumor, while MRI was equivocal in this patient (Fig. 1).

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Fig. 1 Ependymomas comprise about 4 % of primary central nervous tumors in adults, with spinal cord being the most common site [1]. They are the most common intramedullary spinal cord tumors in adults [2]. The age group affected most often is 30–50 years [3]. Ependymomas are derived from the ependymal cells lining the cerebral ventricles and the central canal of spinal cord. The presenting symptoms are related to intrinsic compression of the spinal cord tracts. Age of the patient and histological grade and site of tumor are established prognostic factors [1]. Low-grade tumors (myxopapillary; WHO grade I) are essentially benign and potentially curable if completely resected. Grade II and III tumors are infiltrative variants and may require adjuvant radiotherapy. A 40-year-old female presented with upper back pain and bilateral lower limb weakness 6 years ago. MRI of the spine revealed a mass lesion in the spinal cord at D2-D4 vertebral level with associated syringo-hydromyeloathy suggestive of ependymoma. The patient underwent surgery followed by external beam radiotherapy to the involved segment of the cord. Post therapy the pain subsided, while limb weakness did not show a marked improvement. The patient was then followed with sessions of physiotherapy for 6 years, with partial improvement in limb weakness. About 4 months back she reported with recurrence of pain and worsening of limb weakness. MRI of the spine was repeated and revealed an ill defined intramedullary mixed intensity (predominantly hyperintense) lesion on contrast-enhanced T2-weighted imaging (**a, b, arrow**), extending from C7 to D4 vertebral level with cord expansion. The lesion showed inhomogenous enhancement on

intravenous injection of gadolinium (**a, b, arrow**). The lesion was seen leading to syrinx formation, which extended proximally up to cervico-medullary junction and distally up to conus medullaris. MRI findings were equivocal for recurrent tumor and/or radiation necrosis. To solve this diagnostic dilemma the patient was then referred for FDG PET-CT. The PET-CT imaging revealed a focal area of increased FDG uptake in the spinal cord at D3-D4 vertebral level (**c-f, arrow**). The size of the lesion seen on FDG PET-CT was much smaller than lesion seen on corresponding MRI. FDG PET-CT findings were suggestive of recurrent disease in the lower part of the lesions, while no FDG uptake in upper part of the lesion suggested radiation necrosis. The patient was treated with radiotherapy and showed improvement in pain and limb weakness. The literature about imaging of spinal ependymoma with positron-emitting radionuclides is limited mainly to C-11 labeled methionine PET [4, 5]. The abnormalities seen on PET may sometimes be less extensive than the abnormalities seen on MRI, with PET likely to demonstrate the most metabolically active part of the tumor, as was seen in present case [6]. Residual tumor is not always easily distinguished from radionecrosis and thus PET-CT could add useful information in the assessment of residual disease post treatment [7]. FDG PET-CT has been shown to be superior to MRI for differentiating recurrent tumor from radiation necrosis for brain tumors [8]. Ours is the first case showing the utility of FDG PET-CT for confirming recurrent tumor and differentiating it from radiation necrosis in spinal ependymoma

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