**Metabolic alterations and cholesterol esterification in a low-grade diffuse astrocytoma patient who progressed to glioblastoma at recurrence: Case Report**

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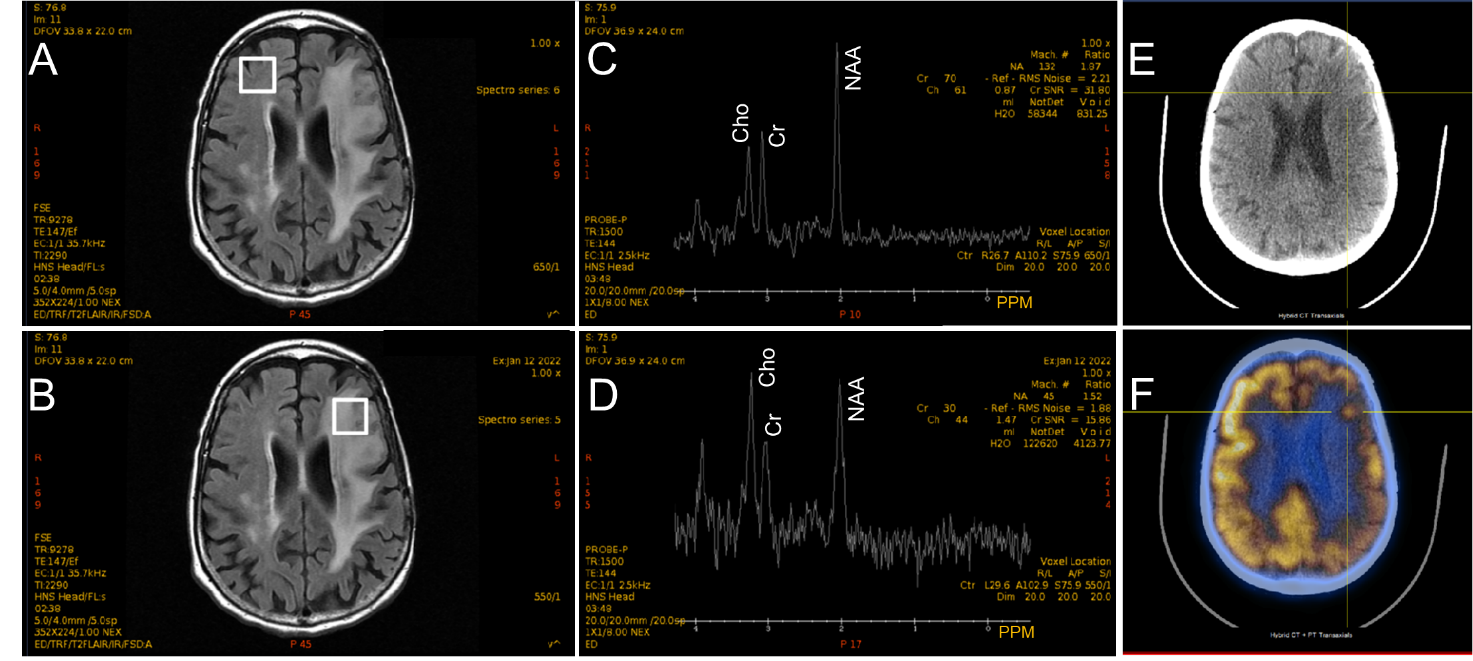
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***In vivo* 1H magnetic resonance spectroscopy (MRS) and CT/PET**



**Figure S1:** *In vivo* 1H MRS and 18F-FDG CT/PET data from the patient showing metabolic profiles of the tumor and non-tumor regions of the brain including 18F-FDG uptake by the tumor.(A) and (B) show axial slices of T2-FLAIR MR images and the location of the spectroscopic voxels (voxel size: 20x20x20 mm3) in the non-tumor and tumor regions of the patient brain. (C) and (D) show the *in vivo* 1H MR spectral profiles of non-tumor and tumor regions (TE = 144 ms; TR = 1500 ms). Figure 2D clearly shows the elevated levels of choline (Cho) and decreased levels of NAA, which are characteristics of a high-grade malignant glioma. (E) and (F) depict CT and CT/PET images showing the uptake of 18F-FDG by the recurrent tumor (crosshairs in Figure 2F).

The *in vivo* 1H magnetic resonance spectroscopy (MRS) of the recurrent tumor showed decreased levels of N-acetylaspartate (NAA) and elevated levels of choline, consistent with the high-grade glioma (Figure S1: D).The Choline-to-NAA (Cho/NAA) ratio which is considered to be a measure of tumor proliferation index was calculated from the peak intensities of the respective metabolite peaks from the non-tumor and tumor regions of the brain (Figure S1: C & D). This ratio for the tumor region was found to be 0.98, while for the non-tumor region this ratio was 0.46. Moreover, the 18F-fluorodeoxy glucose (18F-FDG) positron emission tomography (PET) performed when the patient showed tumor recurrence also showed abnormal uptake of 18F-FDG in the inferior left frontal lobe (Figure S1: F) close to the contrast enhanced tumor region in T1w MRI (Figure S1: E), suggesting the presence of malignant tissue in this region.