ABSTRACT

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Anatomical distribution of cancer stem cells between enhancing nodule and FLAIR hyperintensity in supratentorial glioblastoma: time to recalibrate the surgical target?

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It is ge nerally accepted that glioblastoma (GBM) arise from cancer stem cells (CSC); however, there is little evidence on their anatomical distribution. We investigated the expression and distribution of SOX-2-positive and CD133-positive CSCs both in the enhancing nodule (EN) of GBM and in the FLAIR hyperintensity zones on a surgical, histopathological series of 33 GBMs. The inclusion criterion was the intraoperative sampling of different tumor regions individualized, thanks to neuronavigation and positivity to intraoperative fluorescence with the use of 5-aminolevulinic acid (5-ALA). Thirty-three patients (20 males and 13 females with a mean age at diagnosis of 56 years) met the inclusion criterion. A total of 109 histological samples were evaluated, 52 for ENs and 57 for FLAIR hyperintensity zone. Considering the quantitative distribution of levels of intensity of staining (IS), ES (extent score), and immunoreactivity score (IRS), no difference was found between ENs and FLAIR regions for both the SOX-2 biomarker (respectively, IS $p = 0.851$, ES $p = 0.561$, IRS $p = 1.000$) and the CD133 biomarker (IS $p = 0.653$, ES $p = 0.409$, IRS $p = 0.881$). This evidence suggests to recalibrate the target of surgery for FLAIRECTOMY and 5-ALA could improve the possibility to achieve this goal.

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