Among patients which develop glioblastoma multiform (GBM), recurrence is the rule despite continuous progress in surgery, radiotherapy and chemotherapy. In the adult, GBM is the most frequent and most aggressive tumour of the Central Nervous System. A better understanding of the mechanisms by which these tumours relapse could promote the use of preventive therapy and could increase patients' survival. GBM stem cells have been recently described and it was demonstrated that they are specifically implied in the experimental tumorigenesis. It is thus very attractive to speculate on a possible relationship between these GBM stem cells and the neural stem cells which are persisting in the neurogenic zones of the adult brain. In this review, we formulate and discuss the hypothesis by which, in a patient with GBM, malignant stem cells might be present in the neurogenic zones, away from the tumour mass. This hypothesis could explain the tumour relapse observed after the first treatments.

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