OBJECTIVE: To investigate the expression of CD133 and CD34 in different parts of glioblastoma and its margin and explore the invasive path of glioma stem cells within the tumor and surrounding tissue.

METHODS: The surgical specimens were collected from the core of mass, junctional zones between tumor and peritumoral edematous areas and edematous areas in 52 patients with glioblastoma. Immunohistochemical cell staining and Western blot were employed to evaluate the expression of CD133 in different specimens while immunohistochemistry was used to detect the CD34-microvesel postforming. A correlation analysis was performed between them.

RESULTS: The expression of CD133 was not detected in the control groups while the scores were 7.3 ± 1.4, 5.2 ± 1.1, 2.7 ± 1.0 in junctional zones, tumor cores and edematous areas with immunohistochemistry and 0.79 ± 0.03, 0.38 ± 0.01, 0.20 ± 0.04 with Western blot respectively. There were significant differences between different groups (P < 0.05). Under light microscope, the CD133-positive cells frequently forming perivascular pseudorosettes were dense in junctional zones and mostly clustered near the microvessels in tumor cores and scattered in edematous areas. At a high magnification (200×), the CD34-MVD (/HP) values were 31.3 ± 4.0, 21.8 ± 2.6, 15.3 ± 2.4, 4.7 ± 1.5 respectively in junctional zones, tumor cores, edematous areas and control tissues. Significant differences were also found in these groups (P < 0.05). The expression level of CD133-positive cell was positively correlated with the distribution of CD34-microvessels (r = 0.948, P < 0.05).

CONCLUSION: Glioma stem cells tend to assemble in the junctional zones where the microvessels are enriched. There is probably an intimate nourishing relationship with the microvessels. The distribution of glioma stem cells may be related with the invasiveness within glioblastoma.

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