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doi:10.1016/j.clineuro.2008.11.003
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Early clinical and neuroradiological worsening after radiotherapy and concomitant temozolomide in patients with glioblastoma: Tumour progression or radionecrosis?

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Abstract

Objectives

This study investigates the diagnosis and management of patients with resected brain glioblastomas who presented early clinical and neuroradiological worsening after the completion of the Stupp protocol. Its aim is to discuss the occurrence of early radionecrosis.

Methods

Fifty patients with brain glioblastoma treated by surgical resection and Stupp protocol were reviewed; 15 among them (30%) had early clinical and neuroradiological worsening at the 6-month follow-up. The MR spectroscopy and surgical findings of these patients are reviewed.

Results

MR spectroscopy was in favour of tumour recurrence in 14 among 15 patients and showed radionecrosis in one. Among 10 patients who were reoperated on, 7 had histologically verified tumour recurrence or regrowth, whereas in 3 histopathology showed necrosis without evidence of tumour. The 7 patients with tumour progression had prevalence of focal neuroradiological signs (6/7) and a survival of 7.5–12 months (median survival 10 months). The 4 patients with early radionecrosis (including one patient who was not reoperated on) had clinical worsening with mental deterioration, confusion and ataxia, and MR spectroscopy positive for tumour recurrence in 3. Three were alive 24–30 months after the end of the radiotherapy, whereas one died at 40 months.

Conclusion

Early radionecrosis after the Stupp protocol is not a rare event due to the radiosensitization effect of temozolomide. This phenomenon may predict a durable response to radiotherapy. MR spectroscopy may simulate tumour recurrence. A correct diagnosis is necessary to avoid useless reoperations and incorrect withdrawal of temozolomide.

Keywords: Glioblastoma; Temozolomide; Radionecrosis; Recurrence

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