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## Post-treatment imaging of high-grade gliomas.

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### Abstract

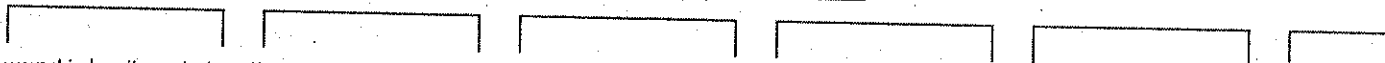
Current standard of care for treatment of newly diagnosed high grade gliomas is surgery followed by concomitant radiotherapy (RT) and chemotherapy (CT) with temozolomide (TMZ). Recently, bevacizumab, an anti - angiogenic agent has also been approved for treatment of recurrent gliomas. Baseline imaging after excision is optimally obtained in the first 24 hours. When baseline postoperative imaging is delayed beyond 24 hours, subacute hemorrhage, subacute ischemia and inflammation at the resection margins render differentiation from residual tumor challenging. Radiation necrosis is a well recognized entity and is differentiated from recurrence based on morphology on structural imaging, presence of lipid - lactate complexes with lack of choline on spectroscopy and low normalized cerebral blood volume (CBV) ratios at perfusion imaging. Novel chemotherapies have lead to the occurrence of interesting but sometimes confusing post treatment imaging appearances including the phenomena of 'pseudoprogression' and 'pseudoresponse'. Pseudoprogression refers to transient, self resolving focal enhancement mediated by TMZ-induced increased vascular permeability and local inflammatory response. Pathologically, these lesions do not have viable tumor. The lesions stabilize or regress without further treatment and are usually clinically asymptomatic. Pseudoresponse refers to rapid regression of enhancement, perfusion, mass effect and midline shift caused by the anti - angiogenic effect of bevacizumab. It is termed pseudoresponse since biological tumor persists as non-enhancing altered signal. It is important for radiologists to be aware of these entities seen on post treatment imaging of gliomas, as misinterpretation may lead to inappropriate management decisions and prognostication.

**KEYWORDS:** Glioma; post treatment; pseudoprogression; pseudoresponse; radiation necrosis

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