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[Brain Tumor Pathol.](#) 2010 Oct;27(2):103-9. Epub 2010 Nov 3.

### **Radiation-induced osteosarcomas after treatment for frontal gliomas: a report of two cases.**

Ito T, Ozaki Y, Sato K, Oikawa M, Tanino M, Nakamura H, Tanaka S.

Department of Neurosurgery, Nakamura Memorial Hospital, Minami 1, Nishi 14, Sapporo, 060-8570, Japan.  
titoh@med.nmh.or.jp

#### **Abstract**

Most radiation-induced osteosarcomas of the skull are reported to arise in the facial bone or paranasal sinus after radiotherapy for retinoblastoma and/or pituitary adenoma. Here we report two cases of radiation-induced osteosarcoma in the paranasal sinus after treatment for frontal glioma. Case 1 was a 56-year-old woman who underwent surgical resection of a left frontal tumor in October 1990. The histological diagnosis was a low-grade glioma, and radiotherapy of 54 Gy was administered. Sixteen years later, in September 2006, the patient noted an enlarging subcutaneous mass in the right frontal region. CT showed an osteolytic mass in the right frontal sinus. An open biopsy established the histopathological diagnosis of osteosarcoma, and the patient subsequently died of rapid tumor regrowth. Case 2 was a 58-year-old man who underwent partial removal of a bifrontal tumor in May 1996. The histological diagnosis was anaplastic oligoastrocytoma, and radiotherapy of 56 Gy was administered. Twelve years later, in March 2008, the patient was readmitted to our hospital for reasons of marked deterioration in general physical condition. Tumor recurrence was suspected in the left frontal lobe, and CT demonstrated an osteolytic mass in the left frontal and ethmoid sinus. A secondary operation was performed, and the pathological specimens were diagnosed as osteosarcoma. Radiotherapy was readministered, but the subject died of rapid tumor regrowth. From these clinicopathological findings, both cases were diagnosed as radiation-induced osteosarcoma. Radiation-induced osteosarcomas appeared 16 and 12 years after radiotherapy in cases 1 and 2, respectively. As the prognosis of radiation-induced osteosarcoma is poorer than that of primary osteo-sarcoma, careful attention is required for consideration of the long-term survival of patients with glioma.

PMID: 21046312 [PubMed - in process]

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