Medically refractory epilepsy associated with temporal lobe ganglioglioma: Characteristics and postoperative outcome

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Objective: Although ganglioglioma is a rare primary neoplasm of brain, it is the most common cause of tumor related refractory partial epilepsy and temporal lobe is the commonest site of its location.[1] Despite several studies on tumor related refractory epilepsy[2], none has addressed the surgical treatment and outcome specifically related to temporal lobe ganglioglioma.

Methods: We reviewed the clinical, electrographic and radiological data of patients with temporal lobe ganglioglioma who underwent surgery after being selected based on noninvasive evaluation consisting of history, scalp recorded interictal and ictal EEG data, high resolution MRI and neuropsychological evaluation, and had more than one-year post-surgery follow-up. All surgeries were done under general anesthesia without the aid of electrocorticography. Seizure outcome was assessed at 3 months, 1 year and yearly thereafter.

Results: Of the 472 patients who underwent surgery from March 1995 through March 2003, 23 (4.8%) patients (17 males, 6 females) had temporal lobe ganglioglioma. The median age at surgery was 20 years (range 1.3 - 37.0 years) and the median duration of epilepsy prior to surgery was 9.0 years (range 1.0 - 25.0 years). None exhibited any overt psychiatric disturbances pre-or post-operatively, nor any tumor related manifestations. MRI revealed tumor in mesial location in 18 patients (78%), lateral in 2 patients and in both locations in the remaining 3 patients. Interictal epileptiform abnormalities (IEDs) were seen on the side of lesion in the majority, 6 had contralateral IEDs as well. The most frequent ictal EEG pattern was Type 2[3] (52%). Standard anterior temporal lobectomy was performed in 18 patients with mesial lesions and additional lesionectomy in 7 patients. None developed any significant post-operative complications or had irradiation. During a median follow-up of 4 years (range 1-7 years), 19 (83%) were completely seizure free. The only factor that predicted an unfavorable seizure outcome was persistence of IEDs in the one-year postoperative EEG (p=0.024). Trend for younger operated patients to achieve a better seizure free outcome was seen. Longer duration of seizures prior to surgery did not affect the outcome.

Discussion and Conclusions: Our study focused on a subgroup of patients with ganglioglioma related refractory temporal lobe epilepsy. Gangliogliomas comprised more than two-thirds of lesional temporal lobe epilepsies. Other than chronic, refractory seizures, tumor related manifestations were not seen. Tumor has a predilection for mesial temporal structures. Contralateral and generalized IEDs were common, but did not affect the outcome. Unlike mesial temporal lobe sclerosis, where Type 1[3] ictal pattern was frequent, Type II ictal pattern was more common with temporal lobe ganglioglioma, but was not associated with a poor outcome.[3] In the absence of tumor invasion of the hippocampus and/or secondary hippocampal sclerosis, inclusion of mesial structures in resection is not warranted. Post-operative psychosis and behavioral problems was not a feature as was thought earlier. Seizure outcome following resection of the tumor is excellent in the majority of the patients. Persistence of IEDs in the one-year post-operative EEG was the single most important factor that predicted an unfavorable outcome.

References

1. Wolf HK, Wiestler OD. Surgical pathology of chronic epileptic seizure disorders. *Brain Pathology* 1993; 3: 371-80.
2. Morris HH, Matkovic Z, Estes ML, *et al*. Ganglioglioma and intractable epilepsy: clinical and neuropsychologic features and predictors of outcome after surgery. *Epilepsia* 1998; 39: 307-13.
3. Pacia SV, Ebersole JS.Intracranial EEG substrates of scalp ictal patterns from temporal lobe foci. *Epilepsia* 1997; 38: 642-54