Awake craniotomy and electrophysiological mapping for eloquent area tumours.

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Abstract

OBJECTIVE: An awake craniotomy facilitates radical excision of eloquent area gliomas and ensures neural integrity during the excision. The study describes our experience with 67 consecutive awake craniotomies for the excision of such tumours.

METHODS: Sixty-seven patients with gliomas in or adjacent to eloquent areas were included in this study. The patient was awake during the procedure and intraoperative cortical and white matter stimulation was performed to safely maximize the extent of surgical resection.

RESULTS: Of the 883 patients who underwent craniotomies for supratentorial intraaxial tumours during the study period, 84 were chosen for an awake craniotomy. Sixty-seven with a histological diagnosis of glioma were included in this study. There were 55 men and 12 women with a median age of 34.6 years. Forty-two (62.6%) patients had positive localization on cortical stimulation. In 6 (8.9%) patients white matter stimulation was positive, five of whom had responses at the end of a radical excision. In 3 patients who developed a neurological deficit during tumour removal, white matter stimulation was negative and cessation of the surgery did not result in neurological improvement. Sixteen patients (24.6%) had intraoperative neurological deficits at the time of wound closure, 9 (13.4%) of whom had persistent mild neurological deficits at discharge, while the remaining 7 improved to normal. At a mean follow-up of 40.8 months, only 4 (5.9%) of these 9 patients had persistent neurological deficits.

CONCLUSION: Awake craniotomy for excision of eloquent area gliomas enable accurate mapping of motor and language areas as well as continuous neurological monitoring during tumour removal. Furthermore, positive responses on white matter stimulation indicate close proximity of eloquent cortex and projection fibres. This should alert the surgeon to the possibility of postoperative deficits to change the surgical strategy. Thus the surgeon can resect tumour safely, with the knowledge that he has not damaged neurological function up to that point in time thus maximizing the tumour resection and minimizing neurological deficits.