

# CLINICAL PAPER /

## BRAIN TUMOR



## Application of neuronavigation system to brain tumor surgery with clinical experience of 420 cases

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### ABSTRACT

A new era of neurosurgery has recently been unveiled with the advent of image-guided surgery. The use of neuronavigation is beginning to have a significant impact on a variety of intracranial procedures. Herein, we report our clinical experience using a neuronavigation system with different surgical applications and techniques for a variety of brain tumors. We used the BrainLab Vector-Vision neuronavigation system, which is a frameless and image-guided system. We operated on 420 cases having various types of brain tumor with the help of this system. The mean target localizing accuracy and mean volume were 1.15 mm and 30.8 mL (0.2-216.4 mL), respectively. We utilized this system to effectively make bone flaps, to detect critically located, deep-seated, subcortical, skull-base and skull bone tumors, and to operate on intraparenchymal lesions with grossly unclear margins, such as gliomas. We also performed tumor biopsy using the combination of a conventional stereotactic biopsy instrument and an endoscope. The application of the neuronavigation system not only revealed benefits for operative planning, appreciation of anatomy, lesion location and the safety of surgery, but also greatly enhanced surgical confidence.