

# ***ROLE OF FUNCTIONAL MRI IN MAKING BRAIN TUMOR SURGERY SAFER***

*ESSAY*

*SUBMITTED FOR PARTIAL FULFILLMENT OF MASTER DEGREE IN  
RADIOLOGY BY*

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## INTRODUCTION AND AIM OF THE WORK

*Neurosurgical procedures in or next to functionally relevant brain centers invariably carry the risk of surgery-induced post-operative neurological deficits (Stippich et al., 2007).*

*During surgical planning for patients with lesions in the frontal and parietal lobes, it is important to map the proximity or involvement of the primary motor cortices as these eloquent areas border the central sulcus whose position can be altered by any pathologic condition like tumors (Achten et al., 1999).*

*Functional MRI (fMRI) has been considered to play a significant role for more detailed and non-invasive mapping of cognitive functions preoperatively (Bindardete et al., 2001).*

*fMRI pinpoint language, cognition and mobility centers of the brain, allow neurosurgeons to remove tumors to the greatest extent possible without harming areas that are critical for the patient's life quality (Petrella et al., 2006).*

*Mapping eloquent areas by MRI is based on the blood oxygenation level-dependent (BOLD) contrast*



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**Aim of work:**

*The Aim of the work is to highlight the role of functional MRI in selecting a safe treatment and to plan and perform function preserving surgery.*



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إِسْـبُـحْـاْذِكْ لَا عِلْمَ لَنَا إِلَّا  
عَلَّمَـتَنَا إِنَّـكَ أَنْتَ الْعَلِيمُ  
الْحَكِيمُ

صدق الله العظيم

سورة البقرة آية (٣٢)



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## *List of Abbreviations*

AC	Auditory cortex
ADP	Adenosine diphosphate
ATP	Adenosine triphosphate
BA	Brodmann area
BOLD	Blood oxygen level dependent
CBF	Cerebral blood flow
CBV	Cerebral blood volume
CNS	Central nervous system
CPC	Choroids plexus carcinoma
CPP	Choroids plexus papilloma
CPT	Choroids plexus tumor
D2	Digit 2
DES	Direct electrical stimulation
EEG	Electroencephalography
EM	Executed movement

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