

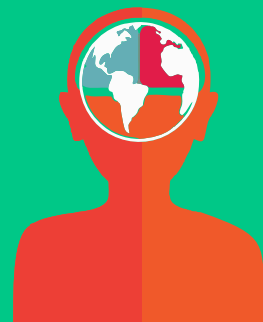
ONCODAILY MEDICAL JOURNAL

abstract

Precision Neurosurgery in the Era of Molecular Neuro-Oncology: Redefining the Role of Surgical Intervention in Intracranial Tumors

Dua Ali, Maheen Raza, Amina Dhanji, Shafaq Tahir

DOI: 10.69690/ODMJ-018-0915-5549



6th Pakistan Pediatric Neuro-Oncology Symposium, Pakistan, 2025

abstract



Precision Neurosurgery in the Era of Molecular Neuro-Oncology: Redefining the Role of Surgical Intervention in Intracranial Tumors

Authors: Dua Ali, Maheen Raza, Amina Dhanji, Shafaq Tahir

Affiliation: Aga Khan University Hospital, Karachi, Pakistan

DOI: [10.69690/ODMJ-018-0915-5549](https://doi.org/10.69690/ODMJ-018-0915-5549)

Introduction: The integration of molecular markers into neuro-oncology has reshaped the role of surgery in intracranial tumors. Precision neurosurgery combines advanced imaging, intraoperative mapping, and molecular profiling to optimize resection while preserving neurological function.

Methodology: A literature review of peer-reviewed studies from 2000 to 2025 was conducted using PubMed and Scopus databases. Search terms included “precision neurosurgery,” “molecular neuro-oncology,” and “intracranial tumors.” Studies addressing the impact of molecular markers on surgical strategy and patient outcomes were included.

Results: Evidence highlights that IDH mutations, 1p/19q co-deletion, and MGMT promoter methylation strongly influence surgical decision-making and prognosis. Precision approaches allow surgeons to tailor interventions to the molecular biology of each tumor, improving both survival and functional outcomes.

Conclusion: Precision neurosurgery, integrated with molecular neuro-oncology, is redefining surgical goals and strategies. It represents a critical evolution in brain tumor management, offering personalized and outcome-driven care.

Conflict of Interest: None

Funding: None

Disclosure statement: None

License: This article is published under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0).

© Dua Ali, 2025. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.