

Advancements of Neurosurgery and Radiation Technique in the Treatment of Tumours

Yugo Hyodo*

Department of Oncology, Neuro Spinal and Cancer Care Institute (NCCI), Karachi, Pakistan

Opinion Article

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***For Correspondence:** Yugo Hyodo, Department of Oncology, Neuro Spinal and Cancer Care Institute (NCCI), Karachi, Pakistan

E-mail: yhyodof@gifu-u.ac.pk

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ABOUT THE STUDY

Brain tumours are highly diverse, affecting people of all ages. These malignancies provide various treatment issues, including rehabilitation and support services for both the sick individual and the carer. However, thanks to advancements in neurosurgery and radiation techniques, as well as the discovery of newer chemotherapeutic and biological agents, the outlook for these tumours has improved during the previous decade. Furthermore, while long-term survivors of brain tumours continue to face significant challenges in several aspects of their daily lives and quality of life. Brain tumours have a low overall incidence (5 per 100,000 person years) and account for only 1-2% of all cancers. However, the number of new brain tumour cases diagnosed each year has consistently climbed over the previous three decades, with China, India, and the United States contributing the most to the worldwide burden. Primary brain tumours are the second highest cause of disability and the main cause of death from cancer among children (14 years) and young adults (15-39 years) globally, according to data from hospital-based cancer registries, including India. Primary brain tumours can develop from a variety of cell types, and they are histologically categorised into various kinds. The most common juvenile brain tumours are astrocytomas, which are followed by primitive embryonal tumours like medulloblastoma, whereas diffuse gliomas (astrocyoma, oligodendroglioma, and glioblastoma) and meningiomas prevail in adulthood.

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The nature of these tumours varies greatly, ranging from benign to malignant. A primary brain tumour is a solid tumour that is described as abnormal cell development within the brain or central spinal canal.

This unregulated and aberrant cell division typically happens in the brain, blood vessels, cranial nerves, brain envelopes (meninges), skull bone, pituitary gland, or pineal gland. When cancer spreads from its initial site to another portion of the body, the new tumour contains the same aberrant cells as the original. A primary brain tumour differs from cancer that spreads to the brain from another part of the body.

When cancer cells move from another organ (such as the lung or breast) to the brain, clinicians may refer to the tumour as a secondary tumour or brain metastasis. There are currently no known causes of brain tumours. It is not caused by an infection or an infectious agent, unlike several other types of tumours in the body. The study of the causes of brain tumours is continuously ongoing. Brain tumours are not contagious and cannot be passed from person to person. Brain tumours can develop at any age. Certain brain tumours, such as gliomas, are more common in middle-aged and older people, whereas others originate during childhood and adolescence.

Radiation exposure is the only proven risk factor for the development of secondary malignancies, particularly brain tumours. People who have had radiotherapy, numerous CT scans, or X-rays of the head are more likely to acquire brain tumours such as meningiomas and, to a lesser extent, malignant gliomas. Although medical radiation exposure is kept as minimal as possible, X-rays and CT scans are key modalities in identifying disorders and determining the best treatment.