OMICS Journal of Radiology
ISSN: 2167-7964

Short Communication Open Access

Radiation Therapy for Meningioma: An Effective Treatment Modality

Payal Patel*

Department of Health Science and Radiology, University of Botswana, Botswana

Introduction

Radiation therapy has emerged as a crucial treatment modality for meningioma, either as a primary treatment option or as an adjuvant therapy following surgery. This article aims to explore the role of radiation therapy in the management of meningioma, including its effectiveness, techniques, potential side effects and recent advancements in the field [1].

Understanding meningioma

They can arise from various locations and may exhibit diverse clinical presentations. While most meningiomas are benign, some can be aggressive or even malignant. Treatment decisions depend on several factors, including tumor size, location, histology, patient age, and overall health [2].

Role of radiation therapy

It can be used as the primary treatment for inoperable or recurrent tumors, as an adjuvant therapy following surgical resection, or as a palliative measure for symptomatic patients. The primary goal of radiation therapy is to eliminate or control tumor growth while minimizing damage to healthy surrounding tissues.

Techniques in radiation therapy

Various techniques are employed in radiation therapy for meningioma, including conventional external beam radiation therapy (EBRT), stereotactic radiosurgery (SRS), and proton therapy. EBRT involves delivering radiation from outside the body, while SRS utilizes highly focused beams of radiation to target the tumor precisely. Proton therapy, a newer technique, offers the advantage of reduced radiation exposure to healthy tissues.

Effectiveness of radiation therapy

Radiation therapy has demonstrated significant efficacy in the treatment of meningioma. Studies have shown high tumor control rates, with a considerable proportion of patients experiencing long-term disease-free survival. The effectiveness of radiation therapy depends on various factors, such as tumor size, location, histology, radiation dose, and patient characteristics [3,4].

Side effects and management

Acute side effects, such as fatigue, nausea, and hair loss, are usually temporary and resolve over time. Late side effects, including radiation-induced fibrosis and neurocognitive deficits, may develop months or years after treatment. However, advances in treatment planning and delivery techniques have significantly reduced the risk of long-term complications.

Description

Recent advancements

In recent years, several advancements have enhanced the efficacy and safety of radiation therapy for meningioma. These include advanced imaging techniques for precise tumor localization, intensity-modulated radiation therapy (IMRT) for improved dose conformity, and the integration of molecular and genetic information to guide treatment decisions. Additionally, ongoing research is exploring the use of immunotherapy and targeted therapies in combination with radiation therapy for enhanced outcomes [5].

Fractionation schemes

Fractionation refers to the division of the total radiation dose into smaller fractions delivered over multiple treatment sessions. Different fractionation schemes are used in radiation therapy for meningioma, including standard fractionation (1.8-2 Gy per fraction), hypofractionation (larger fractions delivered over a shorter treatment period), and stereotactic radiosurgery (high doses delivered in a single or few sessions). The choice of fractionation scheme depends on various factors, including tumor size, location, histology, and patient characteristics [6,7].

Adjuvant radiation therapy

Adjuvant radiation therapy is often recommended following surgical resection of meningioma, especially in cases with aggressive histology, incomplete tumor removal, or a high risk of tumor recurrence. The timing of adjuvant radiation therapy may vary, with some patients receiving it immediately after surgery, while others may undergo surveillance imaging before initiating treatment. Adjuvant radiation therapy aims to reduce the risk of tumor regrowth and improve long-term outcomes.

Radiation therapy for recurrent meningioma

Recurrence of meningioma poses a significant challenge in its management. Radiation therapy plays a crucial role in the treatment of recurrent tumors, either as a salvage treatment option or in combination with other therapies. It can provide effective local control and symptom relief, even in cases where reoperation is not feasible. The decision to use radiation therapy for recurrent meningioma depends on several factors, including the extent of recurrence, prior treatments, and the overall health of the patient [8].

Radiosensitivity of meningioma

Meningiomas are generally considered to be radioresponsive tumors, meaning they are sensitive to the effects of radiation therapy. The response to radiation therapy may vary based on factors such as tumor histology, grade, and genetic characteristics. Higher-grade and atypical meningiomas tend to be more resistant to radiation, while

***Corresponding author:** Payal Patel, Department of Health Science and Radiology, University of Botswana, Botswana, E-mail: Payal_p@gmail.com

Received: 04-May-2023, Manuscript No. roa-23-100641; **Editor assigned:** 06-May-2023, PreQC No. roa-23-100641 (PQ); **Reviewed:** 20-May-2023, QC No. roa-23-100641; **Revised:** 24-May-2023, Manuscript No. roa-23-100641 (R); **Published:** 31-May-2023, DOI: 10.4172/2167-7964.1000451

Citation: Patel P (2023) Radiation Therapy for Meningioma: An Effective Treatment Modality. OMICS J Radiol 12: 451.

benign meningiomas exhibit higher rates of control and long-term survival. The radiobiological properties of meningioma contribute to the success of radiation therapy in these tumors.

Discussion

The management of meningioma requires a multidisciplinary approach involving neurosurgeons, radiation oncologists, neurologists, and other healthcare professionals. Collaboration between these specialists helps in optimizing treatment strategies, considering factors such as tumor location, size, and the potential impact on neurological function [9]. A comprehensive evaluation of each patient's case is crucial for determining the most appropriate treatment plan, which may include surgery, radiation therapy, or a combination of both. Long-term follow-up is essential for patients who undergo radiation therapy for meningioma. Regular imaging studies, such as magnetic resonance imaging (MRI), are performed to monitor tumor response and detect any signs of recurrence. Additionally, long-term side effects and late complications of radiation therapy, such as cognitive deficits and secondary malignancies, should be carefully monitored to ensure timely intervention and supportive care [10].

Conclusion

Radiation therapy plays a pivotal role in the management of meningioma, offering effective treatment options for patients. With advancements in treatment techniques and a better understanding of tumor biology, radiation therapy continues to evolve, providing improved tumor control rates and minimizing treatment-related complications. Further research and collaboration are essential to optimize treatment strategies and improve patient outcomes in the future.

By continuously improving treatment techniques, refining radiation delivery, and conducting clinical trials, radiation therapy continues to demonstrate its effectiveness as a valuable treatment modality for meningioma. Through ongoing research and collaboration, the goal is to further optimize treatment outcomes and enhance the quality of life for patients with this challenging condition.

Acknowledgement

None

Conflict of Interest

None

References

1. Rogers L, Barani I, Chamberlain M, Kaley TJ, McDermott M, et al. (2015) Meningiomas: knowledge base, treatment outcomes, and uncertainties. A RANO review. J Neurosurg 122: 4-23.
2. Sahgal A, Weinberg V, Ma L, Chang E, Chao S, et al. (2013) Probabilities of radiation myelopathy specific to stereotactic body radiation therapy to guide safe practice. Int J Radiat Oncol Biol Phys 85: 341-347.
3. Goldsmith BJ, Wara WM, Wilson CB, Larson DA (1994) Postoperative irradiation for subtotally resected meningiomas. A retrospective analysis of 140 patients treated from 1967 to 1990. J Neurosurg 80: 195-201.
4. Rogers L, Zhang P, Vogelbaum MA, Perry A, Ashbyet LS, et al. (2018) Intermediate-risk meningioma: initial outcomes from NRG Oncology RTOG 0539. J Neurosurg 129: 35-47.
5. Combs SE, Adeberg S, Dittmar JO, Welzel T, Rieken S, et al. (2017) Skull base meningiomas: long-term results and patient self-reported outcome in 507 patients treated with fractionated stereotactic radiotherapy (FSRT) or intensity modulated radiotherapy (IMRT). BMC Cancer 17: 254.
6. Buerki RA, Horbinski CM, Kruser T, Horowitz PM, James CD, et al. (2018) An overview of meningiomas. Future Oncol 14: 2161-2177.
7. Walcott BP, Nahed BV, Brastianos PK, Loeffler JS (2013) Radiation Treatment for WHO Grade II and III Meningiomas. Front Oncol 3: 227.
8. Anvari K, Hosseini S, Rahighi S, Toussi MS, Roshani N, et al. (2016) Intracranial meningiomas: Prognostic factors and treatment outcome in patients undergoing postoperative radiation therapy. Adv Biomed Res 5: 83.
9. Pollock BE, Stafford SL, Utter A, Giannini C, Schreiner SA, et al. (2003) Stereotactic radiosurgery provides equivalent tumor control to Simpson Grade 1 resection for patients with small- to medium-size meningiomas. Int J Radiat Oncol Biol Phys 55: 1000-1005.
10. Combs SE, Schulz-Ertner D, Moschos D, Welzel T, Rieken S, et al. (2013) Skull base meningiomas: Long-term results and patient self-reported outcome in 507 patients treated with fractionated stereotactic radiotherapy (FSRT) or intensity modulated radiotherapy (IMRT). Radiother Oncol 106: 186-191.