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Radiotherapy for Large Single Brain Metastasis of Non-Small Cell Lung

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Abstract:

Lung cancer is the most common primary site of brain metastases. Patients with a single brain metastasis from non-small cell lung cancer (NSCLC) have the potential for long term survival.

Introduction

Brain metastases are more common than all other primary intracranial tumors [1-3]. Lung cancer is the most common primary site [4-6]. Approximately 20–50% of patients present with a single lesion in the brain. Patients with a single brain metastasis from non-small cell lung cancer (NSCLC) have the potential for long term survival [7,8]. Treatment for this lesion includes some combination of steroids, whole-brain radiation therapy (WBRT), local radiation therapy including stereotactic radiosurgery (SRS), and surgical resection. The management for these patients is controversial. Although radiation therapy is non-invasive, whole brain radiation therapy have some brain toxicities. This shifted away from whole brain radiation therapy (WBRT) toward local treatment modalities including radiosurgery (RS) and fractionated stereotactic radiation therapy (FSRT) [9-11].

Discussion:

Brain metastases occur in 6-18% of patients as the first site of failure in patients with non-small cell lung cancer (NSCLC), and in up to 50% as a component of failure in patients who have loco-regionally advanced NSCLC treated with curative intent. Most brain metastases were evident within the first year after treatment [12-14]. The present case report demonstrates that fractionated stereotactic radiotherapy (FSRT) can be considered as a feasible treatment in NSCLC patients with single large brain metastasis. The treatment of large brain metastases (>3 cm in maximum diameter) especially in patients with surgical contraindications. These patients who have brain metastases typically been treated with whole brain radiotherapy (WBRT), stereotactic radiosurgery (SRS), fractionated stereotactic radiotherapy (FSRT) or a combination of these [15-19]. The treatment for large brain metastases is usually determined after considering some factors including tumor number in brain, tumor volume, location of tumor and patient's performance status. The current study provides issue for discussion in the treatment of single large brain metastasis with no extracranial lesions. A large brain metastasis may contain many hypoxic cells that are resistant to radiation [20,21]. FSRT has radiobiological advantages over SRS for large brain metastasis, because reoxygenation of hypoxic tumor cells and redistribution of the cell cycle can be expected between the fractions in FSRT [22,23]. Several studies showed improved clinical results with FSRT for large brain metastases [24- 28]. Additionally, FSRT has some clinical advantages compared with WBRT. Biologically higher doses can be delivered with FSRT than with WBRT.

Conclusion:

In conclusion, FSRT in the current study could achieve good local tumor control and prevent neurological symptoms from worsening. The dose levels of 30 Gy in five fraction seemed to be tolerable and effective against large brain metastases.

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