

Practice Guideline for the Management of Single Brain Metastasis

Abstract

Approximately 15%–30% of patients with cancer will develop cerebral metastases over the course of their disease. Patients identified as having single brain metastasis generally undergo more aggressive treatment than do those with multiple metastases; however, in the province of Ontario, management of patients with single brain metastasis varies. Given that conflicting evidence has been reported, the Neuro-oncology Disease Site Group (DSG) of the Cancer Care Ontario Program in Evidence-based Care felt that a systematic review of the evidence and a practice guideline were warranted.

Keywords: Brain metastasis • Neurooncology • metastasis • radiosurgery

Introduction

The present systematic review and practice guideline has been reviewed and approved by the Neurooncology DSG, which comprises medical and radiation oncologists, surgeons, neurologists, a nurse, and a patient representative. External review by Ontario practitioners was obtained through an electronic survey. Final approval of the guideline report was obtained from the Report Approval Panel and the Neuro-oncology DSG.

Cerebral metastases occur in 15%–30% of cancer patients during the course of their disease. Approximately half of these patients have single metastasis as shown by computed tomography (CT) imaging [1]. Patients with single metastasis tend to undergo more aggressive therapy than do those with multiple metastases; treatment guidelines should therefore be specific to this patient group.

Society of Clinical Oncology (1997–2005) and American Society for Therapeutic Radiology and Oncology (1998–2004) were systematically searched for relevant evidence [2]. The review included fully published reports or abstracts of randomized controlled trials (RCTs), nonrandomized prospective studies, and retrospective studies.

Description

The distinctions between intracranial primary and metastatic cancer and between single and multiple metastases frequently determine choice of treatment; care must be taken in the initial diagnosis of a suspected metastasis. Contrast-enhanced CT imaging or magnetic resonance imaging (MRI) are the standard diagnostic tests for individuals suspected of intracranial primary or metastatic cancer [3]. In individuals that appear to have a single metastasis and in whom the primary tumour site is controlled or unknown, high-dose contrast imaging studies are appropriate. These studies may be accomplished with iodinated contrast and a repeat CT scan. Alternatively, high-dose contrast gadolinium-enhanced MRI may be used, because it has demonstrated increased sensitivity in detecting smaller lesions. However, in several studies using MRI, between 2% and 11% of patients were misdiagnosed as having single brain metastasis [5, 6]. Surgical resection or stereotactic biopsy should be used if a solitary lesion with characteristics of a cancer is seen with no

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known primary to establish tissue diagnosis before other treatments commence [4].

Neurologic Control of Disease Local recurrence of disease was reported in only one randomized trial 5. In the trial by Patchell et al., recurrence or progression at the site of the original metastasis was less frequent in the surgery plus WBRT group than in the WBRT-only group (20% vs. 52%, $p < 0.02$). The median length of time from treatment to recurrence of the brain metastasis was significantly longer in patients who underwent surgery than in patients who received WBRT alone (>59 weeks vs. 21 weeks; $p < 0.0001$).

The Neuro-oncology DSG decided to limit the target population for the present guideline by excluding patients with metastatic lymphoma, small-cell lung cancer, germ-cell tumour, leukaemia, and sarcoma because these primary tumours are radiosensitive and respond differently to radiation therapy than do other tumours [5]. After reviewing the guideline report, the DSG members discussed the role of postoperative WBRT in terms of increased survival. Other issues addressed included SRS versus surgical resection

and the use of WBRT plus SRS. The Neuro-oncology DSG drafted recommendations based on the evidence and attempted to draft recommendations based on perceived practice variations within Ontario.

Acknowledgement

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Conflict of interest

No conflict of interest

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