

Direct decompressive surgery plus radiotherapy improved the ability to walk in spinal cord compression caused by metastatic cancer

Patchell RA, Tibbs PA, Regine WF, et al. Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomised trial. *Lancet*. 2005;366:643-8.

Clinical impact ratings: Hospitalists ★★★★★☆ Neurology ★★★★★☆ Oncology ★★★★★☆

QUESTION

In patients with spinal cord compression caused by metastatic cancer, does direct decompressive surgery plus radiotherapy improve the ability to walk more than radiotherapy alone?

METHODS

Design: Randomized controlled trial.

Allocation: {Concealed}†.*

Blinding: Unblinded.*

Follow-up period: Median 102 days in the surgery group and 93 days in the radiation group.

Setting: 7 institutions in the United States.

Patients: 101 patients \geq 18 years of age (mean age 60 y) with a tissue-proven diagnosis of cancer, evidence of metastatic epidural spinal cord compression (MESCC) on magnetic resonance imaging, \geq 1 neurologic sign or symptom but not totally paraplegic for \geq 48 hours, and expected survival \geq 3 months. MESCC was defined radiographically as a true displacement of the spinal cord (by an epidural mass) from its normal position in the spinal canal. Exclusion criteria included compression only in the cauda equina or spinal roots, multiple discrete compressive lesions, radiosensitive tumors (lymphomas, leukemia, multiple myeloma, and germ-cell tumors), preexisting or concomitant neurologic problems not directly related to MESCC, previous MESCC, and previous spinal radiation.

Intervention: Direct circumferential decompression of the spinal cord within 24 h of randomization, and 3.0 Gy \times 10 fractions of radiotherapy within 14 days after the surgery ($n = 50$); or radiotherapy alone ($n = 51$). Dexamethasone, 100 mg followed by 24 mg every 6 hours, was given to all patients before the start of radiotherapy and then reduced and continued until completion of radiotherapy.

Outcomes: Ability to walk (ambulatory status was defined as \geq 2 steps with each foot unassisted—4 steps total). Secondary outcomes included urinary continence, functional status (Frankel scores), need for corticosteroids and opioid analgesics, and survival time.

Patient follow-up: 100% (intention-to-treat analysis).

MAIN RESULTS

More patients in the surgery group were able to walk than were those in the radiotherapy group (Table), and patients in the surgery group walked longer (median 122 vs 13 d). Surgery-group patients had better maintenance of continence (156 vs 17 d, relative risk [RR] 0.47, 95% CI 0.25 to 0.87), maintenance of functional ability (566 vs 72 d, RR 0.24, CI 0.11 to 0.54), longer survival time (126 vs 100 d, RR 0.60, CI 0.38 to 0.96), and reduced need for corticosteroids (equivalent dexamethasone dose 1.6 vs 4.2 mg/d, $P = 0.009$) and opioid analgesics (equivalent morphine dose 0.4 vs 4.8 mg/d, $P = 0.002$).

CONCLUSION
In patients with spinal cord compression caused by metastatic cancer, direct decompressive surgery plus radiotherapy improved the ability to walk more than radiotherapy alone.

SOURCES OF FUNDING

Sources of funding: National Cancer Institute and National Institute for Neurological Disorders and Stroke.

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*See Glossary.

†Information provided by author.

Direct decompressive surgery plus radiotherapy vs radiotherapy alone for spinal cord compression caused by metastatic cancer at median 93 to 102 days‡

Outcome	Surgery + radiotherapy	Radiotherapy	RBI (95% CI)	NNT (CI)
Ability to walk	84%	57%	48% (15 to 98)	4 (3 to 11)

‡Abbreviations defined in Glossary; RBI, NNT, and CI calculated from data in article.

COMMENTARY

The landmark study by Patchell and colleagues investigated the role of direct decompressive resection in the treatment of MESCC. 101 patients were entered over 10 years before the study was terminated because the criterion of a predetermined stopping rule was met. More patients in the surgery plus postoperative radiation group retained the ability to walk and walked longer than did those in the radiation-alone group. Furthermore, surgery-group patients had better continence and muscle strength, longer overall survival, and lower requirements for opioid analgesics and steroids. The median length of hospitalization was similar in both groups.

Since MESCC is a common complication of cancer, it is surprising that it took 10 years to recruit 101 eligible patients from 7 major centers. Certainly many eligible patients were not entered for reasons that were not clarified, yet this does not necessarily negate the validity of this study. Furthermore, despite the strict entry requirements favoring

longer survival, the median survival time was only 100 days in the radiation group and 126 days in the surgery group. Patients in the surgery group were able to walk for a significantly longer period—122 days compared with just 13 days in the radiation-only group—but this is still a brief length of time. Earlier studies that did not show a benefit of surgery in MESCC were done in an era in which surgical instrumentation and expertise were less developed than today. More recent studies have shown a benefit with direct decompressive surgery, but this is the first study to use a randomized design.

This study shows the superior results with decompressive surgery plus radiotherapy for MESCC, but the procedure requires careful selection of patients and is technically challenging, time-consuming, and costly.

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