FAST FACTS AND CONCEPTS #238
MANAGEMENT OF SPINAL CORD COMPRESSION
Rohtesh S Mehta MD, MPH and Robert Arnold MD

Background
Metastatic spinal cord compression (SCC) is a medical emergency; early treatment is associated with less functional disability. Treatment options include corticosteroids, radiotherapy and surgery. This Fast Fact discusses management of SCC in adults. Fast Fact #237 discusses its diagnosis.

Corticosteroids
Dexamethasone is the most tested steroid in clinical trials. Studies have shown that steroids provide analgesia and reduce vasogenic edema which may lead to better neurological outcomes. Treatment should be started as soon as diagnosis is made; studies in acute spinal cord injury suggest significant neurological improvement when used within 8 hours of injury. Historically, debate existed between using high dose dexamethasone (100 mg loading, then 96 mg daily) versus moderate dose (10 mg loading, then 16 mg daily). A randomized controlled trial comparing the two doses found no differences in efficacy and thus most give the lower dose. (1) Many studies give the steroids divided 4 times a day (total 16 mg daily), tapered over 10-14 days. Most generally start IV and then switch to PO when patients are “clinically stable” and more definitive therapy (radiation or surgery) has been initiated. Steroids should be tapered as soon as possible to prevent long term toxicities (2). Common short term side effects include hyperglycemia, insomnia and gastric distress. Serious acute adverse effects such as gastrointestinal perforation or bleeding, psychosis, risk of infections and death are associated with high doses only (17%) (3).

Radiotherapy (RT)
In the absence of bony instability, RT has historically been the treatment of choice, preferably started within 24 hours of diagnosis. Dose schedule for RT ranges from single fraction 8 Gy to 20 fractions of 40 Gy. One or two fractions of 8 Gy may be preferable in patients with short prognoses and, in one study, had a similar outcome to more prolonged treatment (4). RT results in pain relief in 40-80% of patients and sphincter control in 45-90% of cases (3, 4) when instituted in time. About 90% of ambulatory patients retain ambulation with RT alone, but less than 30% of patients who have lost the ability to walk by the time RT is initiated regain ambulation (3).

Surgery
Until recently, surgery was reserved for cases with SCC in a previously irradiated area, neurologic deterioration during RT, spinal instability, or bony compression. However a recent meta-analysis (5) and a randomized controlled trial (6) found better functional outcomes with surgery plus post-operative RT as compared to RT alone. This trial used a newer surgical technique (circumferential decompression, reconstruction and immediate stabilization). 84% of the patients in the surgery group were ambulatory and retained ambulation for a longer time (a median of122 days) after treatment compared to 57% in the RT group (median 13 days). 62% of the non-ambulatory patients regained the ability to walk after the surgery compared to 19% in the RT groups. The surgery group also maintained continence for a significantly longer time (median 156 days vs. 17 days). A more recent retrospective matched pair analysis of cancer patients with SCC comparing RT alone to surgery plus RT did not find any significant differences in outcome between the two treatments (7). Prompt, interdisciplinary evaluation by radiation oncologists and spine surgeons is indicated in order to identify the best treatment course.

Other treatments
Spinal Stereotactic Radiosurgery (SRS) has an investigational role in adult non-surgical patients with radio-resistant tumor or those with previously irradiated areas. Studies suggest more than 80% improvement in overall neurological function (8). Transarterial embolization is another novel investigational treatment. It is generally used preoperatively for hypervascular spinal tumors causing compression, is safe and effective, and can make radical tumor resection possible at times (9). In adults, chemotherapy has no role in acute management even in chemo-sensitive cancers because of its slow effect. Although bisphosphonates reduce the incidence of skeletal complications of cancer, there are no data to suggest a benefit in treating SCC.

Prognosis
Median survival after developing SCC is between 3-6 months in adults. Poor prognostic factors for survival include non-ambulatory status, SCC within 15 months of original cancer diagnosis, presence of visceral or other bone metastases, cancer type (survival is worse for lung cancer and better
for myeloma/lymphoma), and rapidity of developing motor symptom (worst if <7 days and better if more than 2 weeks after the onset of symptoms).

**Conclusion**  A loading dose of dexamethasone 10 mg IV should be given as soon as possible after diagnosis, followed by maintenance dose of 4 to 6 mg every 6-8 hours, and referral made for primary surgery (if feasible) with adjuvant RT. If surgery is contraindicated, palliative RT alone is indicated.

**References**


**Author Affiliations:** University of Pittsburgh Medical Center, Pittsburgh, PA.

**Version History:** Originally published December 2010; Copy-re-edited November 2015.

**Fast Facts and Concepts** are edited by Sean Marks MD (Medical College of Wisconsin) and associate editor Drew A Rosielle MD (University of Minnesota Medical School), with the generous support of a volunteer peer-review editorial board, and are made available online by the Palliative Care Network of Wisconsin (PCNOW); the authors of each individual Fast Fact are solely responsible for that Fast Fact's content. The full set of Fast Facts are available at Palliative Care Network of Wisconsin with contact information, and how to reference Fast Facts.

**Copyright:** All Fast Facts and Concepts are published under a Creative Commons Attribution-NonCommercial 4.0 International Copyright (http://creativecommons.org/licenses/by-nc/4.0/). Fast Facts can only be copied and distributed for non-commercial, educational purposes. If you adapt or distribute a Fast Fact, let us know!

**Disclaimer:** Fast Facts and Concepts provide educational information for health care professionals. This information is not medical advice. Fast Facts are not continually updated, and new safety information may emerge after a Fast Fact is published. Health care providers should always exercise their own independent clinical judgment and consult other relevant and up-to-date experts and resources. Some Fast Facts cite the use of a product in a dosage, for an indication, or in a manner other than that recommended in the product labeling. Accordingly, the official prescribing information should be consulted before any such product is used.