Posterior decompression and stabilization, and surgical Vertebral Body Stenting for lumbar spine metastasis and epidural cauda equina compression

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Background

• In most patients with spinal metastases
  – general condition is poor
  – metastatic lesions are not solely located in the vertebral body
  – increased risk of treatment failure with larger constructs (extensive tumor infiltration and soft bone)
  – direct decompression and vertebrectomy is difficult and carries a 10-53% risk of major complications (infection, hemorrhage, wound dehiscence and stabilization failure, intra-abdominal vascular or visceral injury, or cerebrospinal fluid leak)
Background

• Less invasive procedures such as percutaneous cementoplasty techniques (vertebroplasty and kyphoplasty) and surgical (open) vertebroplasty may be preferable to larger open surgical procedures.
Aim

• We present the technique of combined posterior decompression and spinal instrumentation, and surgical (open) vertebroplasty using the Vertebral Body Stenting (VBS) in a patient with metastatic vertebral and epidural cauda equina compression.
Patient and Methods

- F, 55-yrs old
- Breast cancer (5 yrs)
- Left thigh pain and left quadriceps muscle weakness (3/5)
- MRI: osteolytic lesion at the left half of the L3 vertebral body with extension to the left pedicle and the epidural space
- CT-guided needle biopsy: metastatic breast carcinoma
Question to the audience

What is the most appropriate treatment option for metastatic epidural cauda equina compression

1. Corticosteroids, analgesics and supportive measures
2. External beam radiotherapy
3. Stereotactic radiosurgery
4. Decompressive Laminectomy and Spine Stabilization
5. Direct, circumferential spinal canal decompression
6. Chemotherapy and hormonal therapy
**Treatment**

- One stage
  - L3 laminectomy and cauda equina decompression,
  - posterior L1-L5 segmental spinal stabilization

(Range Spinal System, *K2M Inc.*, Leesburg, Virginia, USA)
Question to the audience

- What are the advantages of surgical vertebroplasty and VBS for vertebral body metastasis?
  1. epidural decompression & posterior spinal instrumentation
  2. ability to remove tumor (improved outcome and PMMA complete filling of the defect)
  3. improved biomechanical stability and more durable pain relief (PMMA fills the entire vertebral body more evenly, pain-generating periosteum is better stabilized)
  4. immediate management of epidural cement leakage
  5. all of the above
Treatment

• Surgical vertebroplasty
  – Vertebral Body Stenting

(Synthes Inc., Bettlach, Switzerland)
Cement leakage through the left pedicle & posterior vertebral wall to the epidural space. Through the L3 laminoplasty immediate removal of the cement from the epidural space was performed under direct vision obviating any neurological complications.
Question to the audience

What is the main contraindication of percutaneous vertebroplasty technique?

1. pathological compression fractures
2. nerve root involvement
3. metastatic epidural spinal cord compression
4. more than 50% loss of vertebral height
5. other
Question to the audience

• Which are the most common complication of percutaneous vertebroplasty technique when metastases are treated?
  1. pulmonary embolism
  2. cement leakage
  3. neurological injury
  4. tumor recurrence
  5. other
Postoperative Course

At 6 weeks, the patient underwent external beam radiation therapy to avoid any local recurrence.

At 6 months, the patient improved on her neurological status (4/5 left quadriceps muscle strength) and continues her medical breast cancer therapy.
Conclusion

• Surgical vertebroplasty and VBS allow for
  – tumor removal from the vertebral body and the epidural space
  – faster recovery and earlier initiation of systemic therapy
  – avoidance of neurological compromise and spine instability
  – rapid improvement of pain, neurological status and quality of life.