Vertebroplasty and Kyphoplasty for Cancer Pain

Introduction

Percutaneous vertebroplasty and kyphoplasty are two closely related interventional techniques used to treat painful vertebral compression fractures due to malignancy or osteoporosis. Vertebroplasty is the injection of a vertebral body with bone cement, generally polymethylmethacrylate. Kyphoplasty adds the placement of balloons into the vertebral body with an inflation/deflation sequence to create a cavity and perhaps restore height prior to the cement injection. These procedures are most often performed in a percutaneous fashion on an outpatient (or short stay) basis. The mechanism of action is unknown, but is postulated that stabilization of the fracture leads to analgesia. The ideal candidate has severe axial (nonradiating) pain due to a fractured vertebrae. Ideally, the procedure would be performed within 12 months of developing the fracture, although selected patients with incomplete healing, or nonunion fractures, may benefit after this time frame.

Indications

- Painful vertebral compression fractures due to malignant primary or secondary tumors (including myeloma, breast, prostate, lung, or other tumors)
- Painful vertebral compression fractures due to osteoporosis in a cancer or noncancer patient
- Painful hemangioma (benign “tumor”) in a vertebral body
- Painful vertebral compression fractures with osteonecrosis (Kummel’s disease)
- Chronic traumatic vertebral compression fracture with nonunion

Contraindications

- Asymptomatic vertebral compression fractures
- Ongoing infection
- Prophylaxis in an osteoporotic patient
- Uncorrectable coagulopathy
- Myelopathy due to retropulsion of bone/canal compromise
- Allergy to polymethylmethacrylate or opacification agent

Relative Contraindications

- Radicular pain
- Vertebral compression fractures > 70% height loss
- Severe spinal stenosis, asymptomatic retropulsion of bony fragment
- Tumor extension into canal/epidural space
- Lack of surgical backup

Complications

The risks of the procedure are low, but serious complications can occur, with an incidence of less than 1%. The risks include spinal cord compression, nerve root compression, venous embolism, and pulmonary embolism (including cardiovascular collapse). The risk/benefit ratio appears favorable in cancer patients and in those with severe pain related to their fracture.

Summary

Percutaneous vertebroplasty and kyphoplasty are two valuable techniques to treat painful spinal fractures in cancer patients. The procedure produces prompt, significant pain relief in 80–90% of cases, with a low complication rate. The interested reader is directed to the reference list below for further information.

References

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6. McGraw JK, Cardella J, Barr JD, Mathis JM, Sanchez O, Schwartzberg MS, Swan TL, Sacks D; SIR Standards of Practice Committee. Society of Interventional Radiology quality improvement guidelines for percutaneous vertebroplasty. J Vasc Interv Radiol 2003;14:827–31.