UPDATE VERTEBROPLASTY AND KYPHOPLASTY

IN

VERTEBRAL COMPRESSION FRACTURES TREATMENTS.

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The most common fracture in osteoporotic patients.

Prevalence of VCFs in aged 50 to 80 years.

Age correlated prevalence rates

- in women: 7% to 30%
- in men: 4% to 17%

After 1st VCFs, the risk of developing new vertebral fractures increases by 5 to 10 times.
- pain around the fracture site (mild to severe).
- limitation of mobility.
- reduce functional ADL.
- reduce quality of life.
- loss of height, kyphotic deformity.
- focal or global sagittal imbalance, which may lead to chronic back pain.
The actual incidence of VCFs is much greater than that clinically diagnosed. Only 1/3 of vertebral fractures are diagnosed.
Socioeconomic costs!!

- growing elderly population.
- The total economic cost is also far greater than the cost for acute management.

- VCFs can lead to significant long-term morbidity.
VCFs

- DIAGNOSIS
- plain radiograph
MRI

- judging fracture age, as it will show bony edema for an acute fracture.
- evaluation of neural compromise.
- reveal integrity of “spinal ligamentous complex” which can be important during surgical evaluation of fracture stability.
- postcontrast MRI study will detect a pathologic fracture secondary to an oncologic process.
ACUTE VCFS

- a band-like pattern of subchondral edema.
50% of patients with vertebral fractures have osteoporosis (T score, −2.5)
40% have osteopenia (T score −1 to −2.5)

Francis RM, et al.  
Acute and long-term management of patients with vertebral fractures.  
VCFS : TREATMENTS.

- Medical management (Pain control).
- Early mobilization.
- Physiotherapy + brace.
- Preventative medicine.
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Options:
- **NSAIDs**
- **Muscle relaxants**
- **Narcotics**
- **Neuropathic pain agents**
- **Local pain applications**
- **Intercostal nerve block**
VCFS: TREATMENTS

- Medical management (Pain control).
- Early mobilization.
- Physiotherapy + brace.

Preventative medicine:
- Acute pain treatments
- Prevent further injuries
- Strengthening the patient’s supportive axial muscles
- Training the patient’s proprioceptive activities
VCFS: TREATMENTS.

- Medical management (Pain control).
- Early mobilization.
- Physiotherapy + brace.
- Preventative medicine.

Improving bone quality and thus reducing the risk of future fracture: Calcitonin, Bisphosphonates, recombinant parathyroid hormone.
VCFS: TREATMENTS.

- Medical management (Pain control).
- Early mobilization.
- Physiotherapy + brace.
- Preventative medicine.
Indications for Verterbroplasty
(Kyphoplasty)

- Intractable pain,
- Conservative management for at least 3 to 4 weeks should have failed
INDICATIONS

SIRSoP

- (1) painful primary and secondary osteoporotic vertebral compression fractures refractory to medical therapy,
- (2) painful vertebrae with extensive osteolysis or invasion secondary to benign or malignant tumors,
- (3) painful vertebral fracture associated with osteonecrosis.

Several RCTs demonstrated better clinical outcomes for kyphoplasty and vertebroplasty compared with nonsurgical management.

Berenson J, et al., Lancet Oncol 2011;12:
Farrokhi MR, et al. J Neurosurg Spine 2011;14:
Liu JT, et al. Osteoporos Int 2010;21:
Wardlaw D, et al., Lancet 2009;373:
Boonen S, et al., J Bone Miner Res 2011;26:
A randomized trial of vertebroplasty for painful osteoporotic vertebral fractures.

Buchbinder R, Osborne RH, Ebeling PR, et al.

A randomized trial of vertebroplasty for osteoporotic spinal fractures.

Kallmes DF, Comstock BA, Heagerty PJ, et al.
Both studies reported **no difference in pain control or function** between the groups

- from 1 week to 6 months follow-up in one study and 1 month follow-up in the other.
CRITICISM!!

- low enrollment numbers (78 and 131 patients),
- low volume and infrequent rate of vertebroplasty performed at the centers over a long time interval,
- lack of clear inclusion criteria specifying patients with mechanical axial back pain,
- inadequate volume of cement injection.
A randomized trial comparing balloon kyphoplasty and vertebroplasty for vertebral compression fractures due to osteoporosis.

Kyphoplasty and vertebroplasty

+ similar long-term improvement in pain and disability
+ similar safety profiles and few device-related complications.

✗ Procedure duration was shorter with vertebroplasty.

✗ Kyphoplasty had fewer cement leakages and a trend toward longer fracture-free survival.
2013
NICE recommends vertebroplasty and kyphoplasty (without stenting) as possible treatment options for some people with VCFs.
Comparing Percutaneous Vertebroplasty and Conservative Therapy for Treating Osteoporotic Compression Fractures in the Thoracic and Lumbar Spine
A Systematic Review and Meta-Analysis

Ryan Mattie, et al.

meta-analysis of randomized controlled trials

- comparing PVP with conservative treatment or placebo/sham.

- The 531 patients treated with PVP had a significantly lower pain level compared with the control group at 1 to 2 weeks, 2 to 3 months, and 12 months.
Take Home massages

- VCFs have significant effect on patient quality of life and a high socioeconomic cost.
- Conservative management should be attempted for up to 6 weeks.
- Vertebroplasty and kyphoplasty are low-risk procedures that significantly improve pain relief and physical function.
- Preventative medicine should be aimed at improving bone quality and reducing the risk of future fracture.
VCFs have significant effect on patient quality of life and a high socioeconomic cost.

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THANK YOU.