## **Osteoporotic vertebral fracture treatment**

## see Osteoporotic Fracture Treatment Score

Initial therapy for osteoporotic vertebral fractures are bed rest, orthotic devices and pain medication <sup>1)</sup>

However, some patients fail to benefit from these treatment modalities and disease-related morbidity and mortality persists. Conservatively treated OVCF's are cured with partial relief of pain and quality of life within 2 to 12 weeks  $^{3)}$  <sup>4)</sup>

Surgery is rarely employed. In cases where pain control is difficult to obtain or where neural compression causes deficit, limited bony decompression may be considered.

Typical time course of conservative treatment:

1. initially, severe pain may require hospital or subacute care facility admission for adequate pain control utilizing

a) sufficient pain medication

b) bed rest for about 7-10 days (Deep-Vein Thrombosis Prophylaxis recommended)

2. begin physical therapy (PT) after  $\approx$  7-10 days as patient tolerates (prolonged bed rest can promote "disuse osteoporosis")

a) pain control as the patient is mobilized may be enhanced by a lumbar brace which may work by reducing movement which causes repetitive "microfractures"

- b) discharge from the hospital with a lumbar brace for outpatient PT
- 3. pain subsides on average after 4-6 weeks (range 2-12 weeks).

Based on the current literature, the knowledge of the experts, and their classification for osteoporotic fractures (OF classification), the Spine Section of the German Society for Orthopaedics and Trauma has now introduced general treatment recommendations.

A total of 707 clinical cases from 16 hospitals were evaluated. An OF classification-based score was developed for guidance in the option of nonsurgical versus surgical management. For every classification type, differentiated treatment recommendations were deduced. Diagnostic prerequisites for reproducible treatment recommendations were defined: conventional X-rays with consecutive follow-up images (standing position whenever possible), magnetic resonance imaging, and computed tomography scans. OF classification allows for upgrading of fracture severity during the course of radiographic follow-up. The actual classification type is decisive for the score.

A score of fewer than 6 points advocates nonsurgical management; in cases with more than 6 points, surgical management is recommended. The primary goal of treatment is fast and painless mobilization. Because of the expected comorbidities in this age group, minimally invasive procedures are preferred. As a general rule, stability is more important than motion preservation. It is mandatory

to restore the physiological loading capacity of the spine. If the patient was in a compensated unbalanced state at the time of fracture, reconstruction of the individual prefracture sagittal profile is sufficient. The instrumentation technique has to account for compromised bone quality. We recommend the use of cement augmentation or high purchase screws. The particular situations of injuries with neurological impairment, the necessity to fuse, multiple level fractures, consecutive and adjacent fractures and fractures in ankylosing spondylitis are addressed separately.

The therapeutic recommendations presented here provide a reliable and reproducible basis to decide for the treatment choices available. However, intermediate clinical situations with a score of 6 points remain, allowing for both nonsurgical and surgical options. As a result, individualized treatment decisions may still be necessary. In the subsequent step, the recommendations presented will be further evaluated in a multicentre controlled clinical trial <sup>5</sup>.

## Vertebral augmentation

Kyphoplasty was developed to restore vertebral height and improve sagittal alignment. Several studies have shown these theoretical improvements cannot be transferred universally to the clinical setting.

see Vertebral augmentation.

The treatment of osteoporotic vertebral compression fractures using transpedicular cement augmentation has grown significantly since 1990s.

see Vertebroplasty for osteoporotic vertebral fracture.

In a multicenter study, Kallmes et al., randomly assigned 131 patients who had one to three painful osteoporotic vertebral compression fractures to undergo either vertebroplasty or a simulated procedure without cement (control group). The primary outcomes were scores on the modified Roland Morris Disability Questionnaire (RDQ) (on a scale of 0 to 23, with higher scores indicating greater disability) and patients' ratings of average pain intensity during the preceding 24 hours at 1 month (on a scale of 0 to 10, with higher scores indicating more severe pain). Patients were allowed to cross over to the other study group after 1 month.

All patients underwent the assigned intervention (68 vertebroplasties and 63 simulated procedures). The baseline characteristics were similar in the two groups. At 1 month, there was no significant difference between the vertebroplasty group and the control group in either the RDQ score (difference, 0.7; 95% confidence interval [CI], -1.3 to 2.8; P=0.49) or the pain rating (difference, 0.7; 95% CI, -0.3 to 1.7; P=0.19). Both groups had immediate improvement in disability and pain scores after the intervention. Although the two groups did not differ significantly on any secondary outcome measure at 1 month, there was a trend toward a higher rate of clinically meaningful improvement in pain (a 30% decrease from baseline) in the vertebroplasty group (64% vs. 48%, P=0.06). At 3 months, there was a higher crossover rate in the control group than in the vertebroplasty group (51% vs. 13%, P<0.001) [corrected]. There was one serious adverse event in each group.

Improvements in pain and pain-related disability associated with osteoporotic compression fractures

in patients treated with vertebroplasty were similar to the improvements in a control group <sup>6)</sup>.

On the other hand a randomized controlled trial (Fracture Reduction Evaluation [FREE] trial) which took place at 21 sites in eight countries and included 149 patients assigned to balloon kyphoplasty showed that in patients with acute, painful, vertebral fractures, balloon kyphoplasty improved quality of life, function, mobility, and pain more rapidly than did nonsurgical management, with significant differences in improvement between the groups at 1 month<sup>7</sup>.

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