

Chapter 56

Osteoporotic Vertebral Fractures

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Description

In 1993 Genant et al. [1], during their osteoporosis related research, described a semi quantitative method based on the height of T4-L4 vertebrae as shown on lateral views. Vertebral fractures are the most common osteoporotic fractures and it was therefore assumed that they can be used as outcome variables in osteoporosis preventing and treatment studies. Vertebrae T4-L4 were graded on visual inspection and without direct vertebral measurement as:

- Normal (grade 0)
- Mildly deformed (grade 1, approximately 20–25 % reduction in anterior, middle, and/or posterior height)
- Moderately deformed (grade 2, approximately 25–40 % reduction in any height)
- Severely deformed (grade 3, approximately 40 % reduction in any height)
- Additionally, a grade 0.5 was given to designate borderline deformed vertebrae (Fig. 56.1).

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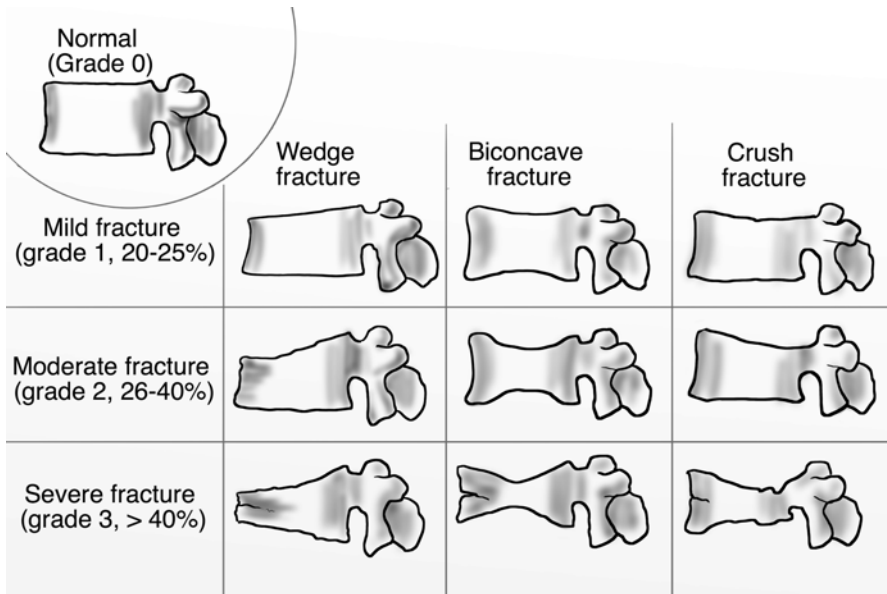


Fig. 56.1 The nine types of osteoporotic vertebral fractures according to the shape of the vertebral body (wedge, biconcave, crush) and the height of the vertebral body from the T4-L4 (grade 0 normal height; grade 1 20–25 % reduction of height; grade 2 25–40 % reduction of height; grade 3 >40 % reduction of height)

Fractures were also classified as:

1. Wedge.
2. Biconcave
3. Crush

whether the anterior, middle or posterior column was relevantly involved.

A vertebral body was considered to be fractured if graded I or higher and it was considered normal if graded 0 or 0.5. In addition, a spinal fracture index (SFI) was calculated for each patient by summing the individual vertebral deformity scores and dividing by the number of vertebrae evaluated.

Treatment Strategy [2–6]

Osteoporotic vertebral compression fractures may remain asymptomatic or minimally symptomatic. Nonetheless, a large number of patients will experience significant pain, affecting their quality of life and causing disability. Non-operative medical treatment for these patients includes pain medication, activity limitation, physical therapy, and (possibly) bracing. In general terms patients with osteoporotic vertebral compression fractures are usually treated non-operatively.

The main operative techniques to surgically treat osteoporotic vertebral compression fractures are kyphoplasty and vertebroplasty. Surgical treatment shall be decided on the basis of pain and percentage of vertebral collapse. If a patient rates his/her pain as being greater than 4 out of 10 (if 10 equals the worst pain imaginable and 0 equals no pain) or the vertebral bodies are collapsed more than 40 %, then kyphoplasty or vertebroplasty is indicated as an initial intervention. Practically this means that grade I and II fractures shall be initially treated non-operatively whereas grade III fractures initial treatment shall be surgical.

Other indications for vertebroplasty or kyphoplasty may be pain-requiring medication persisting for longer than 1 month or advancement of kyphosis despite adequate non-operative care. In cases of neurologic impairment or radiographic evidence of instability more invasive procedures (e.g. decompression and fusion) shall be considered.

In any case patients with osteoporotic vertebral fractures shall be consulted to start anti-osteoporotic medication even if their BMD index is within normal or osteopenic range.

Osteoporotic vertebral fractures – evidence according to Genant classification

Classification	Meta-analysis [7–9]	Systematic review [10,11]	Cochrane library
Grade 1	Percutaneous balloon kyphoplasty or vertebroplasty for symptomatic vertebral fractures	Cement augmentation provides greater pain relief than non-operative treatment	Lack of evidence
Grade 2	Percutaneous balloon kyphoplasty or vertebroplasty for symptomatic vertebral fractures	Cement augmentation provides greater pain relief than non-operative treatment	Lack of evidence
Grade 3	Percutaneous balloon kyphoplasty or vertebroplasty for symptomatic vertebral fractures	Cement augmentation provides greater pain relief than non-operative treatment	Lack of evidence

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