

Kyphoplasty

Kyphoplasty is an innovative technique that combines vertebroplasty with balloon catheter technology developed for angioplasty. The procedure demonstrates positive outcomes in the treatment of painful, progressive osteoporotic or osteolytic vertebral compression fractures.



Figure 1. Vertebral compression fracture

Kyphoplasty involves extra- or transpedicular cannulation of the vertebral body under fluoroscopic guidance, followed by insertion of an inflatable bone tamp (Figure 2).



Figure 2. Insertion of inflatable bone tamp

Once inflated, the tamp restores the vertebral body toward its original height, while creating a cavity to be filled with bone cement. Cement is injected under relatively low pressure (see Figures 3 through 6 below).



Figure 3. Balloon inflation



Figure 4. Cavity is filled with bone cement



Figure 5. Bone tamp is removed



Figure 6. Bone tamp and inflatable balloon

Vertebroplasty, from which the kyphoplasty technique evolved, was developed in response to limited results of medical and surgical modalities to stabilize and strengthen collapsed vertebral bodies. Interventional neuroradiologists, first in France and then in the United States, began transpedicular percutaneous bone cement injections in 1986. Vertebroplasty offers significant benefits: reduced or eliminated fracture pain, prevention of further collapse, a rapid return to mobility and prevention of bone loss caused by bed rest. However, it does not address spinal deformity. It also requires high-pressure cement injection using low-viscosity cement, which leads to cement leaks in 30-80% of procedures, according to recent studies.

Kyphoplasty has several potential advantages over vertebroplasty. It restores vertebral body height with a low risk of cement extravasation. Kyphoplasty is well tolerated and is associated with statistically significant improvements in pain and function.