

Operative treatment of osteoporotic fractures beyond vertebro/kyphoplastie

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Problem

Vertebro- and kyphoplasty cannot solve all problems of osteoporotic spine fractures, especially in severe spinal stenosis and progressive kyphosis; even in high age patients decompression alone cannot solve the majority of these symptoms, as the biomechanical laws remain also in higher age and in the osteoporotic spine.

Patients and method

Our experiences 2004-2010 demonstrate 39 patients, 15 „open“ vertebroplasties (VP with decompression), 12 decompressions with posterior stabilization, 12 anterior decompression and vertebral body resection and stabilization.

The „open“ vertebro/kyphoplasty was combined with 12 laminectomies, 2 hemilaminectomies and 1 microdiscectomy.

The posterior stabilizations all were combined with decompression, in 50% cemented screws were implanted, in single cases additional TLIF, vertebroplasty and cement fixation of disc were used.

Indications of anterior approach were in 67% neurologic lesions and in 33% pain and progressive kyphosis. The approach was in 7 cases thoracophrenolumbotomy, in 3 patients thoracotomy, once via thoracotomy by splitting of diaphragm and in 1 case retroperitoneal.

Complications of „open vertebro/kyphoplasty“ were missing improvement of neurologic symptoms in 2 cases and hematoma with paresis of psoas-muscle in 1 case.

Complications in posterior stabilization were 2 screw-loosenings (reinstrumentation with elongation of fusion), 1 persisting paresis and 1 decubitus.

OP-duration of anterior approach was 165 (135-180) minutes; neurologic symptoms could be extremely improved in all cases. There were no approach-related complications! Complications in anterior approach were: in 3 cases subsidence of cage (1 reoperation), 2 fractures of adjacent vertebra (1 elongation of fusion+AxialLIF), 1 decubitus (plastic surgery), 1 infection (implant removal); all complications were within the first 6 cases! 2 of 3 cases with cage-subsidence were after anterior instrumentation alone!

Rate of complications altogether was 33% (20% in open vertebro/kyphoplasty, 33% in posterior decompression and stabilization, 58% in anterior decompression and stabilization).

Discussion

In neurologic deficit, therapy-resistant pain, failed improvement of vertebro/kyphoplasty and progressive kyphosis after osteoporotic vertebral fractures open operative therapy is indicated. With no or only slight reduction of stability and danger of neurologic deterioration or neurologic damage vertebro/kyphoplasty in combination with decompression is the therapy of choice; in case of more severe instability a posterior stabilization/fusion must be added; if there exists also an anterior compression of neurologic structures, especially with kyphotic deformity, anterior decompression with at least partial resection of vertebral body in combination with posterior stabilization is indicated. Posterior stabilization after anterior resection and decompression is superior to anterior stabilization. In high-grade osteoporosis

cemented pedicle screws should be used; according to our experience up to now no cemented screw showed loosening, breakage or pull-out (102 screws in 13 patients >2years FU). Long-distance fusions demand in some cases the whole experience of the spine-surgeon including TLIF, ALIF, PLIF, AxiaLIF, cementing of disc, sublaminar wiring to reduce the pull-out forces of pedicle-screws and should only be performed by experienced spine surgeons.