

Focus On

Osteoporotic fractures

Osteoporosis is a skeletal disorder characterised by decreased bone strength leading to increased risk of fracture.¹ More than 40% of women and 14% of men over the age of 50 years will experience fractures related to osteoporosis.² Osteoporotic fractures of the spine frequently occur in both men and women.³

Back pain is the principal symptom following an osteoporotic fracture, which tends to improve over three months following the acute event.^{4,5} However it is estimated that between one third and three quarters of these patients may develop chronic back pain.⁶ The chronic pain associated with vertebral compression fractures is thought to be due to mechanical instability of the spine at the site of the fracture. This instability is thought to stimulate nociceptors in the periosteum and joint capsule.⁷

Most symptoms will settle with simple analgesics, on occasions combined with a short period of bed rest. The underlying osteoporosis will need evaluation with a dual-energy x-ray absorptiometry (DEXA) scan and appropriate treatment with pharmacological agents. The majority of agents work by preventing bone resorption. Commonly used bisphosphonates bind to the hydroxyapatite crystals on bone surfaces and inhibit resorption.

Following vertebral osteoporotic fractures patients may develop a kyphosis. This may have significant effect on respiratory function,⁸ as well as increasing the incidence of subsequent osteoporotic fractures due to the alteration in spinal biomechanics. Neurological deficit following low energy osteoporotic fractures is reported but is rare. Patients may experience symptoms of spinal stenosis if there is sufficient retropulsion of the fracture.

Patients require careful evaluation to determine if the osteoporotic fracture is the source of their continuing pain. Clinical findings should be correlated with plain radiographs, however the age of the fracture cannot be accurately determined from radiographs. MRI is useful in determining the age of the fracture, helping to exclude a malignant process and assisting in planning appropriate treatment. In the acute period following a vertebral fracture MRI shows high signal changes on the T2-weighted images and low intensity signal changes on the T1-weighted images. Sagittal short tau inversion recovery (STIR) sequences are extremely helpful; they show high intensity signal changes in areas of oedema from acute or healing fractures.⁹

Surgical intervention is indicated for a minority of patients, when there is progressive neurological deficit or intractable pain due to deformity. The surgery is associated with a high complication rate and a tendency for any instrumentation to cut out of the poor quality bone.¹⁰

In those patients in whom neurological decompression is not required yet intractable back pain continues despite conservative management, stabilisation of the fracture with polymethylmethacrylate by means of either vertebroplasty or kyphoplasty may be indicated. Vertebroplasty was initially described by Galibert et al¹¹ to treat symptomatic haemangiomas of the vertebral body. Low viscosity cement is injected under high pressure into the fractured vertebra via the pedicles. Kyphoplasty, developed by Reiley¹² involves the insertion of an expandable balloon into the vertebral body. Expansion of the balloon aims to correct the kyphotic deformity within the vertebra by increasing the height.¹³ During the expansion process a void is created within the bone, which is filled with cement under low pressure. Both procedures are performed under fluoroscopic control. Patients undergoing kyphoplasty usually require a general anaesthetic. Vertebroplasty has the benefit of not requiring a general anaesthetic as well as being a cheaper procedure.

Both vertebroplasty and kyphoplasty^{14,15} have been shown to offer significant rapid symptomatic relief from vertebral compression fractures. These early results have been shown to be maintained at two years following kyphoplasty.¹⁶

Complications of the procedures although rare include acute neurological deficit due to cement leakage or epidural haemorrhage.^{17,18} Subsequent surgical decompression may be required. The incidence of complications appears to be lower in patients treated with kyphoplasty, although is still rare in patients treated with vertebroplasty.¹⁹ There is also an incidence of adjacent vertebral compression fractures following treatment with kyphoplasty or vertebroplasty.^{20,21}

Conclusion

Osteoporotic compression fractures of the spine are an increasing problem within our ageing population. Although the majority can be treated with conservative treatment a significant proportion of patients may benefit from interventional treatment.

Vertebroplasty and kyphoplasty have been shown to be effective for appropriate patients.²² The incidence of complications appears to be lower in patients treated with kyphoplasty.

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