



ĐẠI HỌC Y DƯỢC TP. HỒ CHÍ MINH

Vertebral compression fractures: When is surgery indicated?

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Introduction

- Vertebral compression fractures
 - The most common sequelae of osteoporosis
 - 700,000 out of a total 1.5 million osteoporotic fractures annually
 - The large number of vertebral fractures that go undetected
 - *One-third of vertebral fractures clinically diagnosed*

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Introduction

- Risk factors for osteoporosis
 - Increased age
 - Tobacco smoking
 - Sedentary lifestyle
 - Alcoholism
 - Secondary osteoporosis has been linked to metabolic disorders, malabsorptive diseases, rheumatism, and hypogonadism

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Clinical presentation

- Chronic compression fractures are commonly detected incidentally on chest X-rays
 - Patients complain of sudden-onset severe, focal
 - Back pain that may radiate anteriorly
 - Confused with a cardiac or pulmonary process

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Clinical presentation

- Retropulsion of fracture fragments
 - Compression of the spinal cord or cauda equina
 - Weakness and loss of sensation of the lower extremities or even bowel or bladder incontinence
 - Constitute a surgical emergency

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Imaging

- The most widely available is a lateral X-ray of the thoracic or lumbar spine
 - Quick screening and identification of fractures
 - Estimation of loss of height
 - Assessment of spinal alignment



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Imaging

- Classified based on the portion of the vertebral body that is affected
 - Wedge-shaped (anterior)
 - Biconcave (middle)
 - Crush (posterior)
 - Minimum of 20% height loss relative to the unaffected portion of the vertebral body



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Imaging

- Computed tomography (CT) scan
 - The best imaging of bony anatomy
 - Improved assessment of loss of height
 - Fragment retropulsion
 - Canal compromise

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Imaging

- MRI evaluation of neural compromise secondary to compression of the spinal cord or nerve root
- MRI (STIR) sequence will also reveal integrity of the spinal ligamentous complex
- Contrast MRI study will detect a pathologic fracture secondary to an oncologic process

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Imaging

- Bone density assessment
 - Treatment of osteoporosis considered
 - Low BMD a T-score of -1.0 to - 2.5
 - **And** either a 10-year risk of hip fracture > 3%
 - **Or** a 10-year risk of any osteoporotic fracture > 20%

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Medical treatment

- Pain control
 - Avoids prolonged bed-rest and allows for early mobilization of the patient
 - NSAIDs, muscle relaxants
 - Narcotic pain medication
 - Neuropathic pain agents
 - Local analgesic patch
 - Intercostal nerve blocks
 - Transcutaneous nerve stimulation units

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Medical treatment

- Preventative medicine
 - Bisphosphonates
 - *Bisphosphonate is a first-line* medication given its favorable safety profile and efficacy in reducing fracture risk
 - Selective estrogen receptor modulators
 - Recombinant parathyroid hormone
 - Calcitonin

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Medical treatment

Drug	Vertebral Fracture	Nonvertebral Fracture	Hip Fracture
Calcitonin	X	No effect demonstrated	No effect demonstrated
Raloxifene	X	No effect demonstrated	No effect demonstrated
Ibandronate	X	No effect demonstrated	No effect demonstrated
Alendronate	X	^a	X
Risedronate	X	X	^a
Zoledronate	X	X	X
Denosumab	X	X	X
Teriparatide	X	X	No effect demonstrated

^a Evidence for effect, but not currently an FDA-approved indication.

Modified from Diab DL, Watts NB. Diagnosis and treatment of osteoporosis in older adults. Endocrinol Metab Clin North Am 2013;42:305–17.

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Medical treatment

- Start with anti-osteoporotic drugs
 - Usually an oral bisphosphonate
 - Alendronate, risedronate
 - Or zoledronic acid IV
 - Denosumab SC
 - Usually drug-treatment for 5 years

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Medical treatment

- Physical therapy
 - Early mobilization in the acute phase and prevent further injuries in the long term
 - Strengthening the patient's supportive axial musculature, in particular the spinal extensors
 - Training the patient's proprioceptive reflexes to improve posture and ambulation and decrease the likelihood of future falls

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Surgical and techniques

- Vertebroplasty
- Kyphoplasty
- Surgical decompression and stabilization

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Surgical and techniques

- Surgical decompression and stabilization
 - Progressive neurologic deficit
 - PLL injury and unstable spines
 - Prevent possible failure due to osteoporotic bone
 - consider long constructs with multiple fixation points
 - consider combined anterior fixation

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Surgical and techniques

- Indications
 - No standard time conservative management
 - Patients should have pain relief by 6 weeks
 - Continue to have unremitting pain
 - Demonstrated fracture progression on follow-up radiograph
 - Consideration should then be given to a vertebral augmentation procedure

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Surgical and techniques

- Indications
 - Eligible patients should have significant back pain and tenderness in the fracture area that increases with mechanical axial loading

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Surgical and techniques

- Contraindication
 - Completely collapsed vertebral bodies, known as vertebra plana
 - CT demonstrates incompetency or fracture through the posterior wall of the vertebrae
 - Bony retropulsion with neurologic compromise
 - Active osteomyelitis of the fracture site or allergies to kyphoplasty cement

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Surgical and techniques

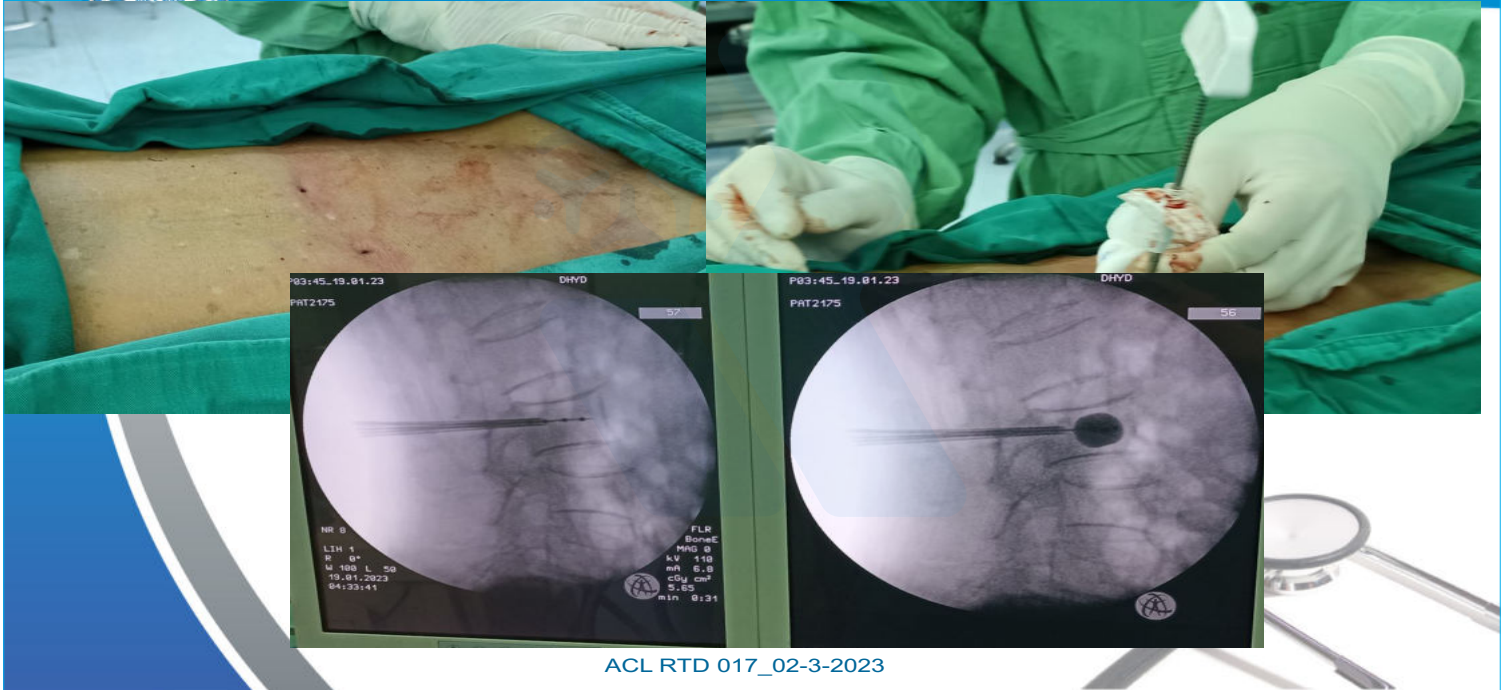
- Kyphoplasty vs. vertebroplasty
 - Fluoroscopic guidance percutaneous transpedicular approach used for cannula

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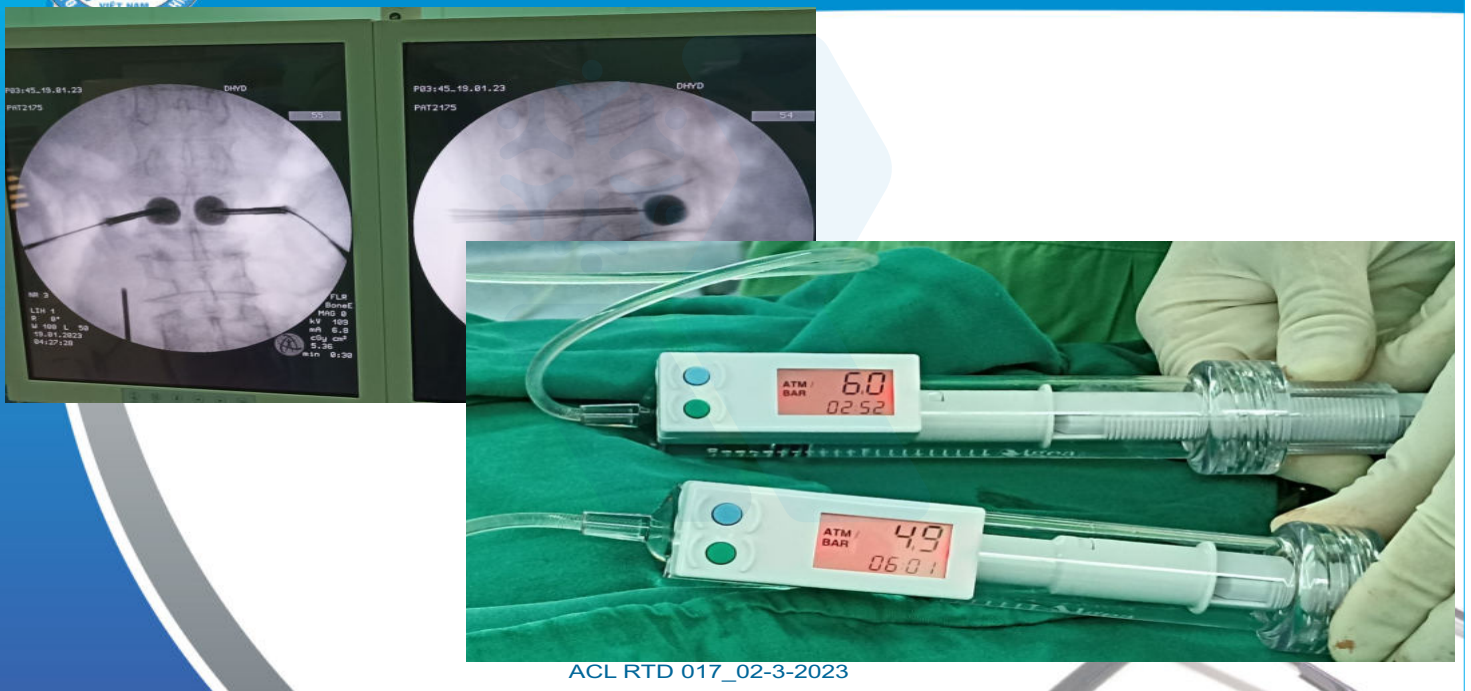
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Surgical and techniques



Surgical and techniques





Surgical and techniques

- Kyphoplasty vs. vertebroplasty
 - Vertebroplasty
 - PMMA injected directly into cancellous bone without cavity creation performed when cement is more liquid requires greater pressure because no cavity is created
 - Increased risk of extravasation into spinal canal is greater

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Surgical and techniques

- Kyphoplasty vs. vertebroplasty
 - Kyphoplasty
 - Cavity created with expansion device prior to PMMA injection performed when cement is more viscous may be possible to obtain partial reduction of fracture with balloon expansion

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Surgical and techniques

- Complications
 - The incidence of cement extravasation into the spinal canal or neuroforamen is rare 0.4%–4%
 - Higher risk with vertebroplasty than kyphoplasty important to consider defects in the posterior cortex of the vertebral body
 - Painful radiculopathy and weakness

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Surgical and techniques

- Complications
 - Pulmonary cement embolism (PCE)
 - Instrumentation of thoracic or thoracolumbar spine had an increased risk
 - Postoperative infection

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Summary

- Significant effect on patient quality of life and a high socioeconomic cost
- Initial management begins conservative
- This may involve coordination with other providers including endocrinologists, physical therapists, and possibly pain specialists

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Summary

- Medical therapy should be aimed at pain control
 - Early mobilization with the assistance of bracing and rehabilitation
 - Improving bone quality with the goal of future fracture prevention

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Summary

- Refractory to conservative treatment of their pain
- Develop worsening of their fracture on subsequent imaging
 - Referral to a spine surgeon

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Thank you

*Nội dung trình bài được tài trợ bởi Sandoz/ Novartis.
Tài liệu tham khảo sẽ được báo cáo viên cung cấp khi có yêu cầu.*

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