

Functional MR Imaging of Vertebral Compression Fracture

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Purpose

- 1) To introduce basic principles of diffusion-weighted, dual-phase chemical shift, dynamic contrast-enhanced magnetic resonance (MR), and fat quantitative imaging and MR spectroscopy (MRS) for vertebral compression fractures.
- 2) To discuss advantages and disadvantages of functional MR imaging for vertebral compression fractures.
- 3) To discuss the incremental value of functional MR imaging.

Outline of Content:

- 1) Diffusion-weighted imaging for vertebral compression fracture (Fig. 1 and Fig.2).
- 2) Dual-phase chemical shift imaging for vertebral compression fracture.
- 3) Dynamic contrast-enhanced magnetic resonance (MR) imaging for vertebral compression fracture.
- 4) MR spectroscopy for vertebral compression fracture.

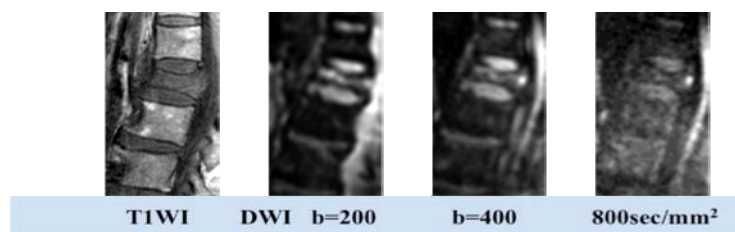


Fig. 1: Pathological Compression Fracture
52-year-old woman ($ADC=1.20 \times 10^{-3} \text{ mm}^2/\text{sec}$)

L2 vertebra shows pathological fracture and low apparent diffusion coefficient (ADC) value.

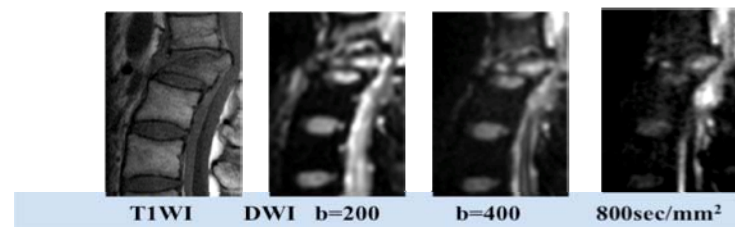


Fig. 2: non-pathological compression fracture
30-year-old woman ($ADC=1.67 \times 10^{-3} \text{ mm}^2/\text{sec}$)

L2 vertebra shows non-pathological fracture and high apparent diffusion coefficient (ADC) value.

Summary:

Various quantitative magnetic resonance (MR) imaging techniques could improve assessment of compression fractures because chemical shift imaging, dynamic MR imaging, and MR spectroscopy may more accurately reflect increased signal intensity on MR imaging, or diffusion imaging may be more eliminated artifact by developing software.