

Oral presentation

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## Demonstration of vertebral and disc mechanical torsion in adolescent idiopathic scoliosis using three-dimensional magnetic resonance imaging

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### Objectives

To demonstrate and measure mechanical torsion in patients with adolescent idiopathic scoliosis using three-dimensional magnetic resonance (MR) imaging.

systematic demonstration of mechanical torsion in idiopathic scoliosis.

### Methods

Ten patients with adolescent idiopathic scoliosis were imaged with three-dimensional MR imaging, and the data post-processed through multiplanar reconstruction to produce images angled through individual endplates. Transverse rotation was measured at each endplate and these measurements used to calculate the amount of vertebral and disc mechanical torsion present. A test object was imaged in order to validate the measurement technique.

### Results

Mechanical torsion was demonstrated within the vertebral bodies and discs of the imaged subjects, with vertebral mechanical torsion contributing on average forty-five percent of the overall transverse plane deformity.

### Conclusion

Deformation occurs in the transverse plane within the vertebrae and discs of subjects with idiopathic scoliosis, and a significant proportion of the rotation present in the scoliotic spine occurs as a result of plastic deformation within the vertebrae themselves. We believe that this is the first