Abstract:

Introduction: Diffusion imaging for functional assessment of molecular transport in the intervertebral disc may be important for understanding pathophysiological mechanism of disk degeneration and comprehensive assessment of the disc disease state.

Aim: to study the utility of apparent diffusion coefficient (ADC) maps in the clinical assessment of patients with degenerative lumbar spine disease and describe characteristic features of ADC maps in various degenerative lumbar spinal conditions.

Methods: MR imaging of 42 consecutive patients admitted to the spinal surgery service were assessed. T1 weighted, T2 weighted and diffusion weighted images (DWI) were studied. ADC maps were generated from DWI images using Osyrixx software. The ADC values and characteristic ADC maps were assessed in the regions of interest over the different pathological entities.

Results: Characteristic ADC map features were identified for protrusion, extrusion and sequestrer types of lumbar disk herniations, spondylolisthesis, reactive Modic endplate changes, Pfirrmann grades of IVD degeneration, and compromised spinal nerves.

Conclusion: Quantitative and qualitative evaluation of ADC mapping may provide additional useful information regarding the fluid dynamics of the degenerated spine, and may complement standard MRI imaging protocol for the comprehensive assessment of surgical patients with lumbar spine pathology...

Additional Author(s):

Andrey Kalinin, MD, PhD
Michael Bohl, MD
Anton Asantsev, MD
Liudmila Bardonova, MD
Mark C. Preul, MD
Morgan B. Giers, PhD
Vadim Byvaltsev, MD, PhD

Presentation Preference: Either Oral OR Poster

Study Design: Retrospective Chart Review

Manuscript: YES

Awards:
Donald O. Quest Basic Science Award Resident/Medical Student
Donald O. Quest Clinical Science Award Resident/Medical Student
Stewart Dunsker Award for Best Clinical Spine Abstract (Spine)
International Abstract Award
Sanford Larson Award for Best Research Award (Spine)
Medical Student and Resident Awards
Louise Eisenhardt Traveling Scholarship (WINS) Resident
Has the work presented in this abstract or substantially similar work been presented or published previously?

No      NA

Has the work in this abstract or substantially similar work being submitted for presentation at another meeting?:

NA

Sponsor: Na

Is your work pending FDA approval?:

No      NA

Are you an Advanced Practice Provider and would like your abstract considered for oral presentation in the Advanced Practice Providers Plenary Session?

Are you a Medical Student or Resident and would like your abstract considered for oral presentation in the Young Neurosurgeons Research Forum?

Yes