Apparent diffusion coefficient and extramedullary intradural spinal cord tumors: pre-operative assessment of tumor aggressive behavior

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Spinal tumors comprise 15% of all CNS tumors;
Their annual incidence is 2-10 per 100000;
Extramedullary, intradural spinal cord tumors (EISCTs) comprise about 53-68.5% of all spinal cord tumors.
Introduction

• The main biomarkers of aggressive behavior have been identified in the pathology literature, including the proliferative marker Ki-67;

• In the literature, diffusion-weighted imaging (DWI) and low apparent diffusion coefficient (ADC) values provide similar markers of aggressive behavior in brain tumors.

The purpose of this study was to determine if there is a correlation between ADC and Ki-67 in EISCTs.
A retrospective analysis of immunohistochemical characteristics and diffusion-weighted imaging of EISCTs was performed. The specimen indices and ADC values were measured. Linear regression analysis of ADC values and Ki-67 was used to compare these numerical parameters.
• There were 31 patients with Ki-67 indices and ADC maps;
• The signs of tumor aggressive behavior are:
  -severe deformation of subarachnoid space,
  -blurring nerve roots,
  -cauda equina asymmetry,
  was confirmed by standard T1- and T-2 WI and intraoperative visualization in 9 patients
Results

The mean Ki-67 (%)

- Nonaggressive: 0.5
- Aggressive: 3.5

The mean ADC (mm²/sec)

- Aggressive: 1500
- Nonaggressive: 500
Associations between Ki-67 and ADC

\[ p=0.002, r= -0.79 \]
Thus, the present study found a strong correlation between Ki-67 and low ADC values. This correlation demonstrates the potential of DWI as a possible biomarker for aggressive malignant behavior EISCTs, which may ultimately affect the surgical approach and postoperative management.
References

Thank you for your attention!