CNS 2018 ANNUAL MEETING
HOUSTON, TEXAS
OCTOBER 6-10, 2018

Use of MR Texture Analysis to Predict Outcome After Percutaneous Cordotomy for Medically-Refractory Cancer Pain

Aditya Vedantam MD; Islam Hassan; Aikaterini Kotrotsou; Rivka R. Colen MD; Ashwin Viswanathan MD

Introduction

There is limited data on the evaluation of the cordotomy lesion to determine outcomes after percutaneous cordotomy for medically-refractory pain. The present study aims to evaluate the utility of MR texture analysis to quantify microstructural changes created by neural ablation and predict outcome in patients undergoing percutaneous cordotomy.

Methods

In this prospective study, MR imaging of the cordotomy lesion was obtained on postoperative day 1 in patients undergoing percutaneous CT-guided cordotomy for medically intractable cancer pain. T2-weighted images of the cordotomy lesion in the high cervical spinal cord were analyzed. Radiomic features were computed and extracted after segmentation of the lesion on T2-weighted images. Pain outcomes were recorded on postoperative day 1 and day 7 using the visual analog scale. R software was used to build statistical models based on MRI texture features for prediction of pain outcomes.

Results

A total of 10 patients (5 males, age range 43-76 years) were included in this study. Six of 10 patients (60%) showed decreased pain on postoperative day 1, and all patients had decreased pain on postoperative day 7. Twenty relevant radiomic features were identified. The C5.0 decision tree classifier was able to predict postoperative day 1 pain scores with an accuracy of 90% (p-value= 0.046), 100% sensitivity, 75% specificity, 85.7% positive predictive value and 100% negative predictive value. This model was also able to predict the postoperative day 7 pain score with an accuracy of 100% (p-value= 0.02825).

Conclusions

MR texture analysis of the cordotomy lesion was able to predict pain outcomes at 1 week after percutaneous cordotomy for medically-refractory cancer pain.

Learning Objectives

But the conclusion of this session, participants should be able to:

1. Recognize that MR texture analysis can be used to evaluate microstructural changes created by the cordotomy lesion in the cervical spinal cord

2. Describe the importance of advanced texture analysis in evaluating conventional MR images of the cervical spinal cord

3. Identify the potential utility of MR texture analysis as a imaging biomarker for cordotomy

[Default Poster]