How Well Do Neuroradiologists Predict the Side of Trigeminal Neuralgia?

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Introduction

With improving MR imaging techniques, physicians can better visualize neurovascular compression (NVC) of the trigeminal nerve as well as proximal and distal nerve atrophy, nerve distortion and demyelinating plaques. This study aimed to determine the inter-rater reliability of these different anatomical variables as well as the accuracy in predicting the side of trigeminal neuralgia (TN) for two neuroradiologists.

Methods

High-resolution MRI sequences including T1-Gadolinium and CISS sequences were reviewed in 43 patients, with symptomatic TN in 44 nerves, who subsequently underwent Gamma Knife radiosurgery. Thirteen patients had MS associated-TN. Two neuroradiologists (NR1, NR2), blinded to the side of TN, assessed for the presence or absence of NVC, proximal or distal atrophy, distorted nerve course as well as predicted the side of TN.

Results

The presence of ipsilateral NVC was reported in 79.5% (NR1) and 70.5% (NR2) of nerves, proximal nerve atrophy in 36.4% (NR1) and 40.9% (NR2), distal nerve atrophy in 20.5% (NR1) and 9.1% (NR2), and nerve distortion in 56.8% (NR1) and 38.6% (NR2). Moderate inter-rater reliability was seen for the assessment of NVC (kappa=0.52, p<0.001) while there was only fair reliability for proximal and distal nerve atrophy and nerve distortion (kappa=0.14-0.24, p>0.05). MS patients were less likely to have ipsilateral NVC. Sensitivity and specificity of predicting the side of TN was 75.6% and 58.0% for NR1 and 61.4% and 58.2% for NR2, respectively. Inter-rater reliability on predicting the side of TN was also moderate (Kappa=0.42, p<0.001).

Conclusions

Despite improving MR imaging, the accuracy of predicting the side of TN is limited with moderate inter-rater reliability. Newer MR imaging techniques assessing the trigeminal nerve pathway are needed to improve diagnostic accuracy and in an effort to better understand the underlying etiology of TN.

Learning Objectives

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

1) understand that the accuracy in predicting the side of trigeminal pain using high resolution MRI sequences is not high

2) to realize that the presence of neurovascular compression is not sufficient for a diagnosis of trigeminal neuralgia

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