Focal cortical dysplasia: classification and role of advanced MRI techniques in evaluation

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Title

Focal cortical dysplasia: classification and role of advanced MRI techniques in evaluation

Purpose

To study the classification of Focal cortical dysplasias (FCD)
To understand the conventional MRI findings in FCD with pathological correlation
To recognize the role of advanced MRI and image processing techniques in evaluating FCD

Outline of content

Malformations of cortical development such as FCD are an important cause of epilepsy. The classification of cortical dysplasia into Type 1 and Type 2, the MRI features of both types and the difficulty in picking up these lesions will be discussed. Identification of FCD can be difficult due to the subtle MRI changes. Smaller lesions and lesions without signal changes can easily go unnoticed. Specialized MRI sequences and image processing techniques should be performed whenever there is a high suspicion for cortical dysplasia. These include a) MRI sequences such as 3D FLAIR, double inversion recovery and high resolution T2 weighted sequence b) image processing techniques such texture analysis, voxel based morphometry and curvilinear reconstruction c) multimodality imaging such as PET overlaid on MRI. These techniques help not only in detection of subtle lesions but also in defining their true extent. DTI Fibre tractography and BOLD functional MRI helps in assessing the proximity of FCD to eloquent white matter tract and cortex respectively. This may help in surgical planning

Summary

Focused and specialized MR examinations enable identification of subtle FCD that are often missed on conventional MRI.