Title of Session: Multiple Sclerosis: From Pathology to Patients Monitoring
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Highlights:
- Changes identified by MR imaging in patients with multiple sclerosis are not completely disease-specific.
- A relatively large list of different disorders may present with multifocal T2 lesions mimicking those seen in multiple sclerosis
- MR imaging pattern of multiple sclerosis lesions is usually relatively specific when age, clinical information, and the full range of MRI abnormalities are taken into consideration

Title: Differential diagnosis in multiple sclerosis
Target audience: radiologists, neurologists
Objectives:
1. To learn about recognition patterns that might be helpful in establishing the diagnosis of multiple sclerosis.
2. To understand the role of spinal cord imaging in the differential diagnosis
3. To appreciate a neuroradiologic diagnostic strategy for multiple white matter lesions of unknown origin.

Conventional MR imaging techniques, such as T2-weighted and gadolinium-enhanced T1-weighted sequences are highly sensitive in detecting multiple sclerosis (MS) plaques and provide a qualitative/quantitative assessment of inflammatory activity and lesion load. However, the changes identified by MR imaging in patients with MS are not disease-specific. Focal white matter T2 hyperintense lesions (T2-HI) mimicking those seen in MS can be detected in a relatively large list of different disorders that may affect middle age and young patients, such as hypoxic-ischemic vasculopathies (CADASIL, Fabry's disease, Susac's syndrome), primary and systemic vasculitis, sarcoidosis, adult forms of leukoencephalopathies, and even in healthy subjects.

While it is recognized that a combination of findings from clinical history, physical examination, and laboratory tests is commonly required to correctly establish a diagnosis of MS, a detailed analysis of different MRI features should also be considered essential: e.g. lesions shape, size, and distribution; contrast-uptake. In addition to these conventional MRI based features, non-conventional MR techniques (perfusion-weighted, MR spectroscopy, susceptibility-weighted) may also provide in some cases useful diagnostic information. Knowledge of these features, will assist the diagnostic work-up of patients presenting with T2-HI, and should be considered a first step to take full advantage of the potential of MRI, and in doing so should result in a reduced chance of misdiagnoses and facilitate the correct diagnosis of sometimes treatable disorders.