CURRENT DIAGNOSIS IN DIFFERENT COUNTRY

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Annotation

The current diagnosis is that various forms of limited or widespread narrowing of the spinal canal due to congenital and acquired causes associated with syndromes that cause significant diagnostic difficulties among secondary lesions of the cervical spine. Myelopathy of the cervix due to stenosis is a disease of the spinal canal, as well as vascular, inflammatory and other diseases that arise in the presence of stenosis of the cervical spine of the computer.

Key words: vascular, inflammatory, cervical spine, electrophysiological

Introduction

Spine diseases are common and exhibit several causes, including degeneration, trauma, congenital issues, and other specific factors. Most people experience a variety of symptoms of spine diseases during their lifetime that are occasionally managed with conservative or surgical treatments. Accurate diagnosis of the spine pathology is essential for the appropriate management of spine disease, and various imaging modalities can be used for the diagnosis, including radiography, computed tomography (CT), magnetic resonance imaging (MRI), and other studies such as EOS, bone scan, single photon emission CT/CT, and electrophysiological test. Patient (or case)-specific selection of the diagnostic modality is crucial; thus, we should be aware of basic information and approaches of the diagnostic modalities. In this review, we discuss in detail, about diagnostic modalities (radiography, CT, MRI, electrophysiologic study, and others) that are widely used for spine disease.

However, the spinal cord and nerve roots cannot be detailed; therefore, radiography has not been recognized as the gold standard for the diagnostic workup of the spine. Computed tomography (CT) and magnetic resonance imaging (MRI) are the second-line imaging modalities for achieving a better understanding of the pathologies of the spine and establish the direction for management.

CT is a valuable imaging modality for both, confirmation of diagnosis and elimination of differential diagnosis. CT is fast, non-invasive, and highly accurate; however, it involves certain drawbacks. CT cannot properly detect certain spinal cord lesions, disk pathologies, and minor lesions. Owing to the previously mentioned limitations of radiography and CT, MRI has been considered the gold standard diagnostic modality for spinal pathologies. Additionally, most spine-related diseases impact the neural structures, including the spinal cord and nerve roots, resulting in several neurological symptoms such as radiating pain, numbness, or paralysis of the affected extremity. For accurate diagnosis of the nerve pathologies in such conditions, the electrophysiological test can also be very useful.

Here, we summarized the use of several commonly used diagnostic modalities, including radiography, CT, MRI, and electrophysiological tests.

Initial evaluation of plain radiography often begins with the anteroposterior and lateral views of the spinal segment at the area of interest. The need for additional studies, such as oblique, flexion, or extension views, is determined based on the clinical situation. Plain radiography demonstrates the inherent advantages of assessing the structural status in a functional position, especially with the patient in an erect and weight-bearing position. Furthermore, it provides a relatively effective assessment of the spinal instability, with flexion and extension (dynamic) lateral radiography. Moreover, dynamic radiography is helpful for evaluating postoperative stability or radiographic fusion as well as detecting the presence of significant motion or evidence of hardware failure or loosening of the instrumented segment.

The main disadvantage of plain radiography is the superimposition of the soft tissue and bony structures that interfere with accurate interpretation of the spinal osseous structures, especially at the cervico-thoracic junction and cranio-cervical junction. Moreover, it cannot be detected properly with the visualization of the paravertebral soft tissues, spinal cord, and bone marrow involvement. Raw CT acquires image data in the axial plane, generates cross-sectional images, and enables sagittal and coronal reconstruction via post-image acquisition processing.

This multiplane reconstruction allows excellent evaluation of the spine, visualization of the bony anatomy of the lesion, demarcation of the extent of bone destruction, and checking of the alignment of the vertebral column. Tissue density can be accentuated via the manual adjustment of the contrast and window levels, and subtle soft tissue abnormalities such as small disc protrusions can be detected. Three-dimensional (3D) volumetric reconstruction allows intuitive illustrations for clinicians. In particular, 3D reconstructed images of the complex structures involving the bone and soft tissues, such as the occipitocervical junction and C1–2 level, are helpful for establishing an accurate diagnosis and presurgical planning.

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