

MRI DIAGNOSIS OF TUBERCULOUS SPONDYLITIS (Review)

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Abstract

The rapid pace of the scientific and technological revolution in the 1970s led to the possibility of using magnetic resonance imaging, based on the phenomenon of nuclear magnetic resonance, in medical diagnostics. The effect of nuclear magnetic resonance was discovered in the mid-1940s and for almost 30 years was used exclusively for scientific purposes in physics and chemistry [Keevil SF, 2001]. This method opened up excellent prospects for clinicians in the diagnosis of cardiovascular and endocrine diseases, neoplastic processes of various localizations, pathologies of the musculoskeletal system and neurological disorders of various etiologies [Kurbatov V.P., 2003; Wimmer V., 1990; Bloem JL, 2000; Soto J.A., 2000].

Keywords: MRI, tuberculous spondylitis, differential diagnosis.

Introduction

The use of MRI in the diagnosis of tuberculous spondylitis, from the point of view of most authors, seems extremely important, since it allows for optimal visualization of changes both in the vertebral bodies and in the paravertebral soft tissues [Kholin A.V., 1995; Panova M.M., 1997; Batukhtin E.N., 2000; Gunicheva N.V., 2003; Berns D . H ., 1989; A 1 Mulhim F. A ., 1995 ; Arisano T., 1995]. A.K. Kravtsov (1996), E.G. Sivina (1998), I.R. Kuzina (2000) consider MRI to be one of the most advanced technologies for obtaining diagnostic images of the spine and spinal canal structures.

The use of MRI as the first post-clinical diagnostic method significantly reduces the time of disease confirmation, and therefore the duration of inpatient treatment, allows to avoid unjustified surgical interventions, and perform organ-preserving operations [Kholin A.V., 1997; Zavadovskaya V.D., 2000; Kolesov V.Yu., 2000; Mitusova G.M., 2002]. Many authors are unanimous in their conclusions: for early diagnosis of tuberculous spondylitis, it is necessary to include MRI in the complex of clinical, laboratory and radiation studies [Gunicheva N.V., 1998; Oleynik V.V., 2001, Sovetova N.A., 2001, Lavrov V.N., 2002].

When studying the relevance of the problem of radiation diagnostics of tuberculous spondylitis, one cannot help but highlight the following postulate: the X-ray method and MRI, being based on different physical processes, provide images of different nature, complementing each other [Batukhtin E.N., 1998; Ratobylsky G.V., 2004]. They cannot be opposed or exclude each other and should be used in accordance with their capabilities and specific diagnostic tasks [Vasiliev A.V., 2000]. Indeed, the traditional X-ray method plays a basic role, since it allows for a sufficiently complete characterization of changes in the vertebral bodies and the suspicion of the presence of abscesses [Batukhtin E.N., 2001]. Summarizing the literature data on the research of





various authors on the role of MRI in the diagnosis of tuberculous lesions of the spine, the following conclusion can be made: MRI is the optimal method for early diagnosis of inflammatory changes in the spine and paravertebral soft tissues, detection and detailed characterization of abscesses, assessment of the condition of the spinal canal and structures of the dural sac.

However, it should be noted that the study of the capabilities of low-intensity MRI for the diagnosis of tuberculous spondylitis is insufficiently covered in both domestic and foreign publications. Publications devoted to this topic do not always fully reflect the main features of spinal tuberculosis and its complications. The situation is complicated by the lack of uniform, standard magnetic resonance protocols.

In this regard, there is a need for a more in-depth study of the possibilities of low-field MRI in the diagnosis of tuberculous spondylitis and its complications at the present stage.

Hyperintense T2 - mode formations based on the results of magnetic resonance imaging. In the publication by E. N. Batukhtin (2001), it is noted that at the height of the spondylitic phase, the process of capsule formation begins and the homogeneity of the hyperintense T2 signal is lost. Thus, the data of our study, in terms of the advantages of magnetic resonance imaging in visualizing and characterizing scalloped abscesses, compared to radiography, basically coincide with the observations of individual authors, but surpass them in the degree of detail and specification, both in the description of abscesses and in the comparison of the role of both methods.

The data obtained in this work confirm the importance of magnetic resonance imaging in tuberculous spondylitis, in assessing the state of structures located in the spinal canal. Most patients (83.3%) had compression of the spinal canal at the level of the affected vertebral bodies. Epiduritis was recorded in 33.3% of patients with penetration of compressing masses into the spinal canal but compression of the dural sac and in 21.4% of cases with penetration, but without compression. The highest specific (80%) had a subgroup of patients in whom the compressing substrate was represented by disk fragments, bone sequestrum and caseous masses; in other cases, these were only caseous masses. It was not possible to obtain any information on the state of the spinal canal, spinal cord or its membranes from the X-ray picture of the spine at the level of interest. The high information content of magnetic resonance imaging in visualizing pathological changes in the spinal canal in tuberculous spondylitis is presented in individual literary sources, but our study reflects in more detail both the nature of the compressing substrate and the state of the structures of the spinal canal as a whole.

Based on the data presented in the chapters devoted to our own observations, a number of conclusions can be drawn. It is important to note that the radiological method retains its basic significance in the diagnosis of tuberculous spondylitis. The work conducted revealed a number of aspects of the preferential use of magnetic resonance imaging in tuberculous spondylitis. The preference for magnetic resonance imaging over radiological diagnostic methods is associated with better visualization of both bone and soft tissue structures of the spinal column, including abscesses that complicate the course of tuberculous spondylitis. Optimal determination of the main pathological processes in the intervertebral discs in tuberculous spondylitis in the spondylitic phase is also achieved using magnetic resonance imaging. Magnetic resonance imaging data are most informative in describing the spinal cord, its membranes and the contents of the epidural space,





primarily in determining the level of compression of the spinal cord in the area of the affected vertebrae, its structural state and the substrate of compression.

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