Case Report

BRUCELLA DISCITIS

M. Savaş Tepe, M.D.

Test Imaging Center, Istanbul, Turkey.

ABSTRACT

Brucellosis is endemic in certain parts of the world. Musculoskeletal involvement is the most common complication of brucellosis. The spine and intervertebral discs are most frequently affected.

In this case, we report the MRI findings of a brucellar spondylodiscitis located at L5-S1 level and overview of applications of MRI in brucella spondylodiscitis and its differential diagnosis.

Key Words: Brucellosis, Spine, Disc.

INTRODUCTION

Brucellosis is a zoonosis of worldwide distribution. It is a small, gram negative, non-mobile, nonencapsulated cocobacillus. Organisms are shed in the excreta (urine, stool, vaginal discharge, milk) of contaminated animals (1). After entering the human body, it is ultimately localized in the reticuloendothelial system (RES), where a small noncaseating granuloma could be formed. This noncaseating granuloma cannot be differentiated from other granulomas. This granuloma could regress, heal or progress and cause tissue destruction and abscess formation. Incubation period is between 1-3 weeks but much longer periods have been described. Prevalance is high in the areas where drinking of raw milk is traditional. Brucellosis is a multisystem disease. The most common location is RES followed by the spine (2). Intervertebral disc space and spine are the most common locations of musculoskeletal brucellosis. In the spine, most commonly lumbar and L4 vertebra are affected (2). The gastrointestinal tract, cardiovascular system, respiratory system, central nervous system can also be affected by the disease.

A common extraspinal skeletal location is the synovial membrane of the joints presenting as synovitis with resultant effusion. Large joints are frequently affected, with predilection of the knee and sacroiliac joints.

Brucellosis can manifest as an acute, subacute or chronic disease. Pain, localized tenderness, radiculopathy, myelopathy are the initial symptoms of brucellar spondylitis. A definitive diagnosis is made by isolating the organisms directly from tissue or body fluids with varied success. Serologic results and agglutination tests are valuable when IgG and IgM antibody titers are 1:160 or higher. Doxycycline, trimethoprim/sulfamethoxazole and rifampin have been used for medical treatment. Here, we report the MRI findings of a brucellar spondylodiscitis located at L5-S1 level.

(Accepted 27 May, 2001) *Marmara Medical Journal 2001;14(3):182-185*

Correspondance to: M. Savaş Tepe, M.D. - TEST Imaging Center, Vali Konağı Cad., Sezai Selek Sok. No: 21, 80200 Nişantası, Istanbul, Turkey
e.mail address: stepe@superonline.com

CASE REPORT

A sixty-six-year old female patient complained of back pain, fever, particularly high at nights for three weeks, loss of appetite, weight loss and sweating. Clinical examination showed limited and painful lumbar movements.

Plain X ray films showed adjacent anterior vertebral degeneration, endplate erosion and irregularity at L5-S1 level which were nonspecific. MRI showed endplate erosion, areas of low signal intensity in T1 weighted images (Fig.1) and high signal intensity on T2W images in the L5-S1 vertebrae as well as T2 hyperintensity in the L5-S1 intervertebral disc (Fig.2). Post GDDTPA images showed intense pathologic contrast enhancement in the disc space and adjacent vertebrae (Fig.3).

Organisms were isolated from the blood specimen and the diagnosis was made. Serology was positive for brucella.

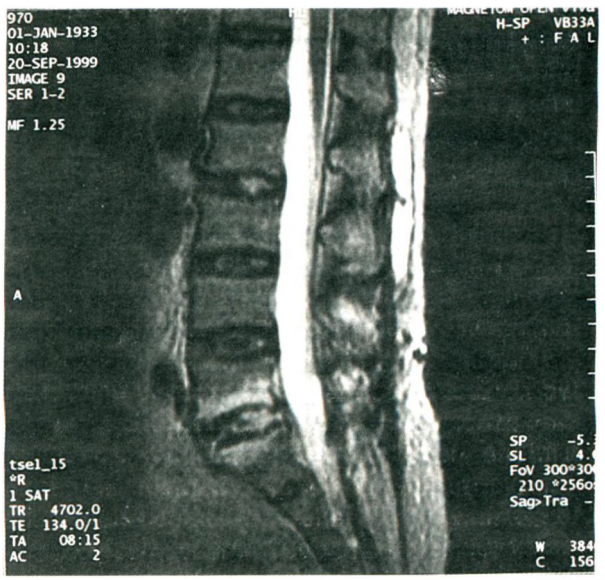

Fig.2: MR, T2 W image; there is disc height loss, abnormal high signal intensity in the intervertebral disc and the adjacent vertabrae.

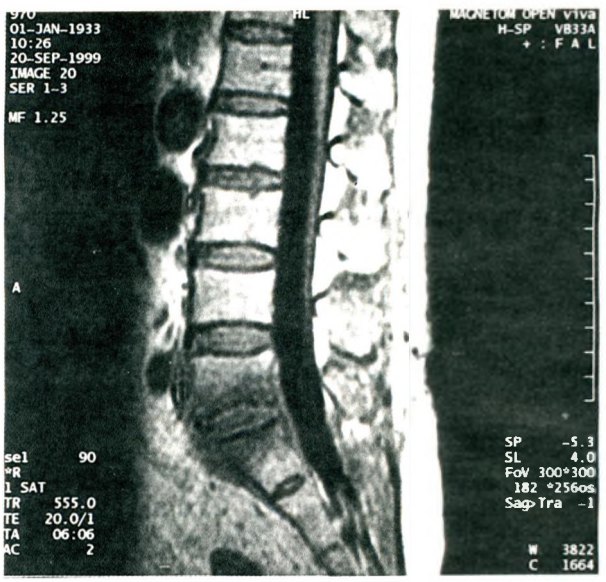

Fig.1: MR, T1 W image shows endplate erosion, abnormal low signal intensity in the L5-S1 intervertebral disc and the adjacent vertabrae.

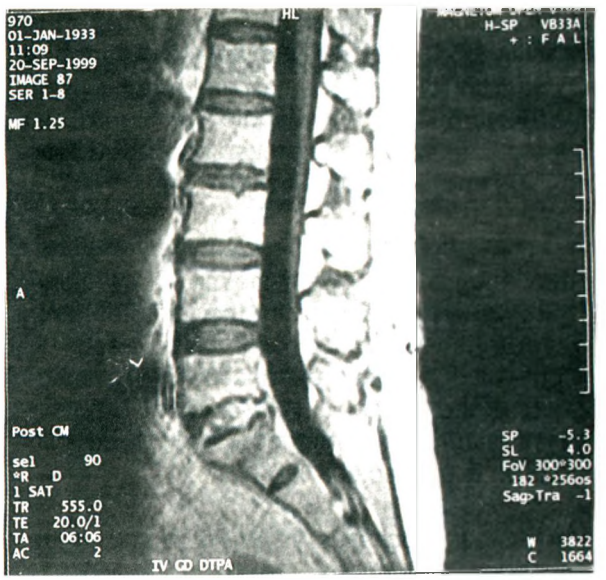

Fig.3: MR, T1 W post GDDTPA image; intense pathologic contrast enhancement in the disc space and adjacent vertabrae.

DISCUSSION

There are two forms of spinal brucellosis: focal and diffuse (2). In the focal form, osteomyelitis is localized to the anterior endplate. This classically happens at the superior endplate of the lumbar vertebra and the discovertebral junction. In the focal form, disc, paraspinal soft tissue, spinal canal are not affected. There is erosion of the vertebral endplate and sclerosis, and there are suggestive of inflammatory signal intensity changes in MRI. If the disease is not treated or

reinfection occurs, progression of the disease process from a focal form to a diffuse form can occur.

In diffuse form, osteomyelitis affects the whole vertebral endplate or the vertebral corpus. Infection is disseminated by vascular links between ligaments, vertebral body and adjacent discs. When softening of the osseous vertebral body and its destruction are seen, disc material herniates in to the osseous endplate and subsequently infective process may invade the adjacent soft tissues. Osteomyelitis involving adjacent vertebrae, intervertebral discitis and epidural extension, are the findings of brucellar spondilitis (3).

Radiologically, X ray and CT show focal erosion, sclerosis, osteophyte formation and disc gas (vacuum phenomenon), MR shows focally abnormal signal intensities in the spinal form of focal brucellosis. In diffuse spinal brucellosis, X rays and CT show vertebral endplate and disc destruction, disc height loss, intradisc gas, MRI shows diffuse abnormal signal intensities in the intervertebral disc and the adjacent vertebrae. CT sagittal reformations can prove to be useful. In the diffuse form, whole vertebra, disc, paraspinal soft tissues, adjacent vertebra, epidural space can be affected.

In brucella discitis, MRI shows hypointensities in T1 W images, hyperintensities in T2 W images. There is enhancement in the affected areas when intravenous Gadolinium is used. Fat suppressed contrast enhanced T1 W images increase the conspicuity of epidural extension. MR is the preferred method if a localized spinal infection is suspected (3,4).

In infectious processes, T1 W, T2 W and contrast enhanced sequences are used in MR. The infectious areas appear to be hypointense in T1 W sequences but hyperintense in T2 W sequences. Disc is also hyperintense in T2 W images. If intravenous Gadolinium is used, diffuse contrast enhancement is seen in the affected areas (3, 5-7).

After the lumbar area thoracolumbar and less frequently cervical area are effected. In the cervical spine, lower cervical location is more typical. Osteomyelitis, discitis, epidural spinal infection are less likely to happen in the cervical area but when they do, they tend to be more aggressive (5,8).

In spontaneous (non post-operative) infectious discitis, the most common pathogens are staphilococcus, streptococcus, candida and mycobacterium. Spontaneous infectious intervertebral discitis typically manifests with nonspecific, slow or insidious symptoms, and can be difficult to differentiate from back and neck pains related to other reasons such as degeneration or disc protrusion. Most of these patients are older than 50 years and already have other painful back pain complaints. There can be a secondary delay of a few weeks or months before the actual diagnosis considered and the specific antibiotic treatment is started. After the diagnosis of infectious discitis is made by diagnostic imaging methods, specific microbiologic diagnosis is sought to direct medical therapy. In this instance, pathogens can directly be isolated with CT guided percutaneous needle aspiration procedure. CT guided percutaneous aspiration of radiologically abnormal sites yield 100 % diagnosis in bacterial infections. In fungal infections, diagnostic specificity is no more than 50 % with CT guided aspiration procedures (6).

MR is more sensitive than CT and myelography in the diagnosis of discitis, osteomyelitis and epidural abscess (4).

MR imaging is 96 % sensitive and 94 % accurate determining the spinal infection (9).

Tuberculosis is usually seen in the thoracic spine in adults, can manifest in a variety of ways and generally is difficult to differentiate from pyogenic infections. Clinically, spinal tuberculosis is more insidious than pyogenic infections. Usually, multilevel (more than two vertebra) is affected. In chronic cases there is a sharp angulated kyphosis called gibbus deformity. Calcification in the paraspinal musculature is a characteristic of tuberculosis. Intervertebral disc space is relatively spared (4,10). Gibbus deformity is not seen in spinal brucellosis.

Paraspinal irregular soft tissue mass and vertebral body destruction is seen in aggresive

infections like staphylococcus infections and can simulate malignancy (9). The major differential diagnosis of tuberculous spondylitis is with other spondylitides such as pyogenic vertebral osteomyelitis, brucellosis, actinomykosis. Lumbar predilection, disc gas, mild epidural extension, lack of paraspinal mass, bone sclerosis, are helpful to differentiate spinal brucellosis from tuberculosis spondylitis. But these findings are nonspecific and diagnosis in tuberculosis must be made by either isolation of the organism or demonstration of the caseating granuloma histologically (11). In spinal brucellosis high or rising titres of the brucella organism, isolation of the organism, sharp clinical answer to therapy, are helpful diagnostic findings.

In our case, intervertebral disc at the L5-S1 level and adjacent endplates are all affected consistent with the diffuse form of brucella discitis.

MRI is the preferred imaging method for the initial diagnosis, post therapy and follow up imaging of spinal brucellosis (9). MRI findings are nonspecific yet with supporting clinical findings, diagnosis of brucellosis can be entertained enabling initiation of therapy at an early stage.

REFERENCES

1. *Berkow R, Fletcher AJ. Bacterial diseases. The Merck Manual of Diagnosis and Therapy. ch1, 16 th edition. New Jersey: Merck & Co. Inc., 1992:109.*
2. *Al-Shahed MS, Sharif LS, Haddad MC, et al. Imaging features of musculoskeletal brucellosis. Radiographics 1994;14:333-348.*
3. *Haughton VM, Daniels DL, Czervionke LF, et al. Cervical spine. In; Stark DD, Bradley WG, eds. Magnetic Resonance Imaging, third edition, volume 3. St. Louis, Missouri: Mosby, 1999:1849-1850.*
4. *Castillo M, Smith JK, Mukherji SK. The spine In: Lee JKT, Sagel SS, Stanley RJ, Heiken JP, eds. Computed Body Tomography with MRI correlation, third edition. Philadelphia, PA: Lippincott Raven, 1998; 1467-1470.*
5. *Friedman D, Hills J. Cervical epidural spinal infection: MR imaging characteristics. AJR 1994;163:699-704.*
6. *Chew FS, Kline MJ. Diagnostic yield of CT-guided percutaneous aspiration procedures in suspected spontaneous infectious diskitis: Radiology 2001;218:211-214.*
7. *Brant-Zawadzki MN, Dennis SC, Gade GF, Weinstein MP. Low back pain. Radiology 2000;217:321-330.*
8. *Pina MA, Ara JR, Modrego PJ, Juyol MC, Capablo JL. Brucellar spinal epidural abscess. Eur J Neurology 1999;6:87-89.*
9. *Slone RS, Gierada DS. Pleura, chest wall, and diaphragm. In: Lee JKT, Sagel SS, Stanley RJ, Heiken JP, eds. Computed Body Tomography with MRI correlation, third edition, vol one. Philadelphia, PA: Lippincott Raven, 1998:509-510.*
10. *Maiuri F, Iaconnetta G, Gallicchio B, Manto A, Briganti F. Spondylodiskitis: Clinical and magnetic resonance diagnosis. Spine 1997;22:1741-1746.*
11. *Osborn AG. Nonneoplastic disorders of the spine and spinal cord. Diagnostic Neuroradiology. St. Louis, Missouri: Mosby, 1994: 824.*