MRI in spinal hydatid disease

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Patient: 44 years, male

Clinical History:

The patient presented with symptoms of spinal cord compression: low back pain and sciatica. He was not systemically ill.

Imaging Findings:

The patient presented with symptoms of spinal cord compression: low back pain and sciatica. He was not systemically ill. The patient had no past history of hydatid disease of the liver, lungs or spine. On examination there was hyperreflexia and a marked reduction in the motor power of the lower limbs, loss of sensation and changes in function of the sphincter and bladder.

An X-ray film of the spinal column was obtained. It was positive, showing partial destruction of L1. CT showed a paravertebral mass and destruction of L1. MRI showed complex multiloculated, multiseptated, predominantly cystic masses, hypointense on T1-weighted images and hyperintense on T2-weighted images. On T2-weighted images various amounts of hyperintensity with intervening areas of low intensity were noticed in the multiloculated cysts. The cyst wall was thin and regular. No septations were noted. On T2-weighted images the cyst wall had a low intensity rim around homogenous, high-signal cyst content. After the administration of intravenous gadolinium, only minimal enhancement of the pericyst capsule was detected. The spinal hydatid cysts had caused expansion and destruction of vertebrae. They had invaded the adjacent soft tissues and extended into the spinal canal, causing compression of the spinal cord. With MRI the full extent of the disease was revealed, the stages of the hydatid cysts were detected and preoperative planning of the surgical excision was performed.

On complete blood count, eosinophilia was present. Enzyme-linked immunosorbent assay for hydatid disease was suggestive of eosinophilia.

The patient underwent surgery with removal of the hydatid cysts and decompression of the spinal cord. The MRI diagnosis was confirmed by histological and parasitological examinations. After surgery oral treatment with mebendazole was instituted. The patient made a complete neurological recover, immediately following surgery. After a follow-up period of 2 years, he had no recurrence.

Discussion:

Hydatid disease is caused by the parasitic tapeworm Taenia echinococcus. Twelve different species have been identified, but only E.granulosus and E.multilocularis affect man. Hydatid disease involves bone in about 0.5-2% of cases. The spine is involved in about 44-50% of these cases and is the commonest skeletal manifestation. It is a rare occurrence, even in rural areas where echinococcosis is endemic, but it is the most serious. It is a relatively
silent and slowly progressive disease with a latent period of many years. Spine involvement begins in the vertebral body, where the parasite develops in multiple small cysts. Then it may spread to the pedicles, laminae, paravertebral soft tissues and adjacent ribs. Intervertebral disks are usually not involved. Herniation into a collapsed vertebra produces apparent disk narrowing.

Hydatid cysts of the spine are classified into five types: type 1, primary intramedullary cyst; type 2, intradural, extramedullary cyst; type 3, extradural, intraspinal cyst; type 4, hydatid disease of the vertebra; type 5, paravertebral hydatid disease. Type 2 intradural cysts are very rare and most often are solitary. The most common type is the vertebral location, type 4. Type 3 primary extradural cysts are usually considered to arise from an undetected bony focus. Paraplegia in hydatid disease is usually due to type 3, type 4 or type 5 cysts.

The diagnosis of the hydatid disease of the spine is not simple, unless the patient comes from an endemic area or has a history of hydatid disease elsewhere. A clinical presentation of cord compression is not pathognomonic of the disease.

X-rays can reveal a widened spinal canal with nonspecific osseous destruction in the advanced stages. In the past, myelography had an important role. CT has proved helpful in recognising the occurrence of hydatid cysts, playing a complimentary role to MRI. It can demonstrate intradural or extradural multiculated cystic masses, the extent of bone destruction, widening of the spinal canal, extension of the disease into adjacent soft tissues and possible calcifications of the peripheral rim. CT myelography is able to demonstrate the extent of the hydatid cysts and the status of the vertebrae.

MRI is used as the primary radiological investigation in patients with myeloradiculopathy, because it is superior in demonstrating compression of the neural structures and in appreciating the extent of the disease. Experience is limited in describing the MR findings of hydatid disease. No pathognomonic features of the disease have been found.

MRI confirms the cystic nature of the lesions. The cysts usually appear as well-circumscribed cystic lesions. The signal intensities of primary cysts are similar to those of cerebrospinal fluid. The other cysts have no specific characteristics. High signal intensity on T2-weighted images suggests viability of the hydatid cysts. Cysts with isointense signal to muscle on both T1-weighted and T2-weighted images or cysts with signal tending to be lower on T2-weighted images and a little higher on T1-weighted images are dying or dead cysts. MR images show involvement of the epidural and intradural spaces and recurrence better than CT. Even very small daughter cysts can be detected and on T1-weighted images slight vertebral involvement can be evaluated better than with CT.

Intravenous contrast administration can help in the differential diagnosis, with the demonstration of possible infection in the cyst and the reaction of the soft tissues around a ruptured cyst.

The surgical removal of all cysts during the first operation is essential. The best way to achieve this is to perform the operation early in the progress of the disease. Curative surgery may not be possible if the cysts are multiple and inaccessible, or if the patient has had previous operations for hydatid disease. Surgery achieves only partial and temporary improvement in these patients. The prognosis for neurological recovery in hydatid disease of the spine is thought to be poor. The disease has a reported mortality rate of more than 50%. The average length of survival of patients is 5 years. Removal of the hydatid cysts and prolonged administration of medication (such as mebendazole, benzimidazole or albendazole) to control the skeletal parasitic infection can result in a better prognosis.

Patients must undergo strict follow up. Recurrence is common when cysts rupture during surgical removal causing diffuse spread within the bone and spinal canal. If spinal hydatid disease is removed unruptured and other common primary sites are excluded, the patient may improve dramatically.

**Differential Diagnosis List:** Spinal hydatid disease
Final Diagnosis: Spinal hydatid disease

References:

Description: Sagittal T1-weighted SE images show a complex multiloculated, multiseptated, hypointense, predominantly cystic mass of L1. Origin:
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