Neurosurgical Forum LETTERS TO THE EDITOR

Parasitic spinal infections

TO THE EDITOR: We read with great interest the recently published article by Majmundar and colleagues³ in *Neurosurgical Focus* (Majmundar N, Patel PD, Dodson V, et al: Parasitic infections of the spine: case series and review of the literature. *Neurosurg Focus* 46(1):E12, January 2019). Based on their 2 cases, they collect and analyze in detail the infection features of common spinal parasites by searching PubMed,³ and they also provide insights into the treatment of these parasites. Although the paper summarizes the current treatment experience of spinal parasites, some aspects might deserve further emphasis.

Hydatid and cysticercus are the 2 most common parasites in the world and constitute a worldwide epidemic. Overall, spinal involvements are uncommon. Southwest China is an area in which hydatidosis and cysticercosis are highly present. Hydatidosis mainly exists among Tibetans in the areas in which they live, and the yak is the intermediate host. The cause of infection is mainly related to the eating habits of the local people, who feed themselves directly by hand. A few people are infected by eating raw beef infected with hydatid. The main problem is that most patients with spinal hydatidosis obtain an accurate diagnosis only after surgery (or biopsy). For spinal hydatidosis, surgery in the absence of a preoperative diagnosis causes most patients to lose the opportunity of undergoing preoperative anthelmintic treatment and intraoperative special treatments, and to experience frequent postoperative recurrence of infection until death.

The endemic areas of hydatidosis often overlap with areas in which tuberculosis is endemic. Paravertebral/vertebral hydatidosis and spinal tuberculosis have very similar clinical manifestations. Spinal tuberculosis accounts for approximately 2% of all cases of tuberculosis and approximately 15% of extrapulmonary tuberculosis cases,¹ which has caused most paravertebral and vertebral hydatidosis to be initially misdiagnosed as spinal tuberculosis and to receive prompt surgical treatment. The differential diagnosis in radiological images plays a key role in reaching a preoperative diagnosis in patients with spinal hydatidosis. Spinal tuberculosis mainly damages the vertebral body and does not invade the disc² (Fig. 1B). However, paravertebral and vertebral hydatidosis invade not only vertebral bodies but also discs and other adjacent structures, and

present as a lobulated, multilocular, septated cystic mass² (Fig. 1A). For suspected cases, serology-specific antibody tests for hydatidosis also have a high positive rate.

Yong Xia, MD
Long Yi Chen, MD

Sichuan Academy of Medical Sciences & Sichuan Provincial People's Hospital, University of Electronic Science and Technology of China, Sichuan, People's Republic of China

References

1. Chen CH, Chen YM, Lee CW, Chang YJ, Cheng CY, Hung JK: Early diagnosis of spinal tuberculosis. *J Formos Med Assoc* 115:825–836, 2016
2. Kafaji A, Al-Zain T, Lemcke J, Al-Zain F: Spinal manifestation of hydatid disease: a case series of 36 patients. *World Neurosurg* 80:620–626, 2013
3. Majmundar N, Patel PD, Dodson V, Tran A, Goldstein I, Assina R: Parasitic infections of the spine: case series and review of the literature. *Neurosurg Focus* 46(1):E12, 2019

FIG. 1. Paravertebral/vertebral hydatidosis and spinal tuberculosis. **A:** Destruction of the vertebral body and adjacent structures in spinal hydatidosis (arrow). **B:** Collapsed vertebral body (arrow) but relatively intact discs (arrowheads) in spinal tuberculosis.

Disclosures

The authors report no conflict of interest.

Correspondence

Yong Xia: 476257237@qq.com.

INCLUDE WHEN CITING

DOI: 10.3171/2019.2.FOCUS19110.

Response

We thank Drs. Xia and Chen for their interest in our paper as well as their insights regarding the treatment of neurocysticercosis and echinococcal disease. We agree with the authors that parasitic infections present a unique challenge in treatment, particularly due to a delay in diagnosis, thereby preventing patients from receiving early anthelmintic treatments. In our original paper we mention that due to the rarity of these diseases, especially in developed countries, a thorough patient history is an essential first step in obtaining the correct diagnosis.

In cases of neurocysticercosis, the most common parasitic infection of the CNS, history as well as brain imaging are both essential in correctly identifying the cause of the pathology. In addition, serological testing as well as funduscopy with thorough ophthalmological evaluation are useful.^{1,2}

The authors also focused on echinococcal disease and its prevalence in Southwest China, particularly among Tibetans, with the yak as the intermediate host. They correctly noted the diagnostic challenge this parasite presents—it can be incorrectly diagnosed as or confounded by concurrent tuberculosis infection. In many cases, patients who harbor spinal hydatid disease are also serologically positive for tuberculosis, resulting in a higher likelihood of misdiagnosing echinococcal disease of the spine as tuberculosis and delaying proper treatment. In our paper we discuss the key imaging findings of echinococcal disease, noting that the MRI will demonstrate an isointense/hypointense cyst on T1-weighted imaging and a hyperintense cyst with hypointense cyst wall on T2-weighted imaging. Diffusion-weighted imaging can further assist in differentiating hydatid disease from abscesses.⁴ Although the authors point out that the disc is generally preserved in cases of spinal tuberculosis, this is not always the case.

In their publication explaining the different MRI findings in spinal tuberculosis, Moorthy and Prabhu described the different patterns of vertebral involvement as paradiscal, anterior, posterior elements, and central lesions.³ In the majority of cases, particularly those of central and posterior element involvement, biopsy is necessary to make the correct diagnosis.

We appreciate the authors' personal comments regarding their experiences in the treatment of parasitic diseases involving the spine. As we noted, a thorough patient history, pertinent serological tests, and most notably advanced imaging are necessary for correct diagnosis. Although these diagnostic aids may help guide the clinician toward identifying the cause of the patient's presenting symptoms, biopsy and resection will be necessary in most unsolved cases, especially if the patients present with worsening neurological function.

Neil Majmundar, MD

Vincent Dodson, BS

Ira Goldstein, MD

Rachid Assina, MD

Rutgers New Jersey Medical School, Newark, NJ

References

1. Del Brutto OH, Nash TE, White AC Jr, Rajshekhar V, Wilkins PP, Singh G, et al: Revised diagnostic criteria for neurocysticercosis. *J Neurol Sci* **372**:202–210, 2017
2. do Amaral LL, Nunes RH, da Rocha AJ: Parasitic and rare spinal infections. *Neuroimaging Clin N Am* **25**:259–279, 2015
3. Moorthy S, Prabhu NK: Spectrum of MR imaging findings in spinal tuberculosis. *AJR Am J Roentgenol* **179**:979–983, 2002
4. Pamir MN, Ozduman K, Elmaci I: Spinal hydatid disease. *Spinal Cord* **40**:153–160, 2002

INCLUDE WHEN CITING

DOI: 10.3171/2019.3.FOCUS19121.

©AANS 2019, except where prohibited by US copyright law