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THORACIC SUBARACHNOID EXTRAPARENCHYMAL NEUROCYSTICERCOSIS: A CASE REPORT OF A RARE PRESENTATION OF A PERSISTENT PUBLIC HEALTH CHALLENGE

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ABSTRACT

INTRODUCTION: Neurocysticercosis is the most common parasitic infection of central nervous system. Spinal form incidence is estimated in 0.7 to 3.0% of individuals with neurocysticercosis. Spinal chord form in its intradural variant is the rarest. It consists of a public health problem mainly in developing countries, Brazil being one of the endemic regions.

CASE REPORT: Patient of 59 years old reporting back pain for 2 months, escalating to complete paraplegia with pyramidal signs, with no clear sensory level. Magnetic resonance imaging of thoracic spine consistent with cystic lesion at the level of T4-T5. After multidisciplinary discussion, systemic therapy was initiated and surgical approach proposed. Intraoperative microscopy revealed multiple loculated lesions with apparent scolex in its interior. Histopathological examination confirmed neurocysticercosis.

DISCUSSION: Human cysticercosis occurs by the ingestion of stool released eggs which pass to external environment (fecal-oral route). Neurological impairment severity depends on affected region and degree of inflammation. Diagnosis basis consists on neuro-imaging studies and detection of antigens and antibodies. Treatment includes surgery, symptomatic therapy and anti-parasitic drugs.

CONCLUSION: Sanitary conditions share close relationship with neurocysticercosis and fight against the disease is a World Health Organization (WHO) priority, being one of the seven neglected zoonosis. Cases as exposed are rare and reinforce importance of differential diagnosis and early treatment in order to reduce complications and achievement of better long-term results.

Keywords: Neurocysticercosis, Spinal Cord Compression, Spinal Canal, Central Nervous System Cysts, Public Health Surveillance.

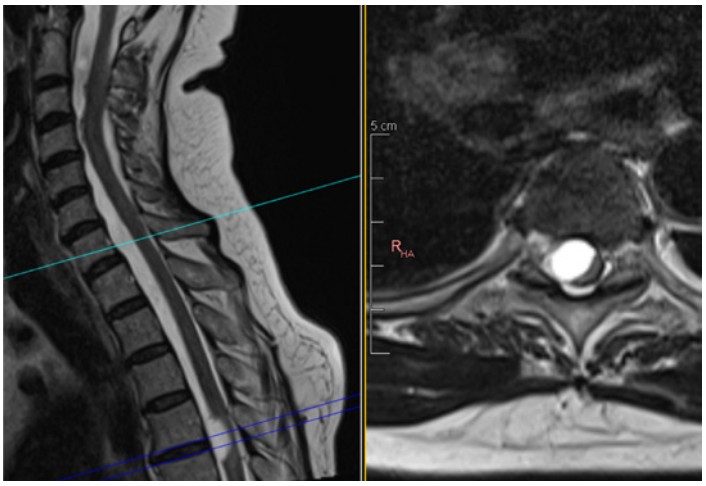
INTRODUCTION

Neurocysticercosis is the most common parasitic infection of the central nervous system. First described by Rockitansky [1], the disease is acquired through the oral ingestion of contaminated food containing mature and viable eggs of Taenia solium. The incidence of the spinal form of neurocysticercosis is estimated to be between 0.7% and 3.0% of individuals with neurocysticercosis [1–5]. Its prevalence and mortality are likely underestimated due to underdiagnosis in endemic areas where neuroimaging is not available [3]. Most cases of neurocysticercosis manifest in the parenchymal form (91%), with ventricular cysts and subarachnoid/spinal cysts being less common (6% and 0.2%, respectively) [6]. From an anatomical standpoint, the spinal form in its intradural variant is the rarest [4]. Neurocysticercosis is a public health issue, particularly in developing countries, including Latin America, Asia, and Africa, with Brazil being one of the endemic regions [1–5].

CASE REPORT

Patient LFC, a 59-year-old female housewife from the interior of Goiás, presented with a history of stabbing dorsalgia at rest, which began two months prior to hospital admission, progressing to paresthesia in the lower limbs. One month before, she developed paraparesis, predominantly on the right side, requiring support to walk and experiencing urinary strain. Two weeks before, she progressed to complete paraplegia and urinary retention. Additionally, she had deep vein thrombosis and pulmonary thromboembolism, for which she was being treated during hospitalization. Neurological physical examination revealed complete paraplegia, pyramidal release signs, and no apparent sensory level (sensation preserved). Magnetic resonance imaging (MRI) of the cervical spine showed poorly defined areas of signal alteration within the dural sac, with findings suggestive of adhesive arachnoiditis. Thoracic spine MRI showed a loculated cystic component anterolaterally on the right at the T4-T5 level, compressing and displacing the thoracic cord (Figure 1). Cerebrospinal fluid analysis demonstrated hyperproteinorrachia of 321 mg/dL and a cell count of 10/mm ^{3} with lymphocytic predominance. The test for IgG class antibodies against cysticerci in the cerebrospinal fluid was positive. After a multidisciplinary discussion, systemic therapy with dexamethasone and albendazole was initiated, and surgical intervention was recommended for the thoracic spinal lesion. The patient underwent a right hemilaminectomy at the T4-T5 level, followed by a longitudinal paramedian durotomy on the right. Microscopy revealed multiloculated cystic lesions with an apparent scolex inside (Figure 2). The lesions also exhibited a valve mechanism for clear content extrusion, resembling a "papo-de-anjo" or pouch-like structure (Figure 3), along with associated adhesive arachnoiditis (Figure 4). The pathological study confirmed the diagnosis of extraparenchymal neurocysticercosis. The patient showed partial improvement in motor deficit and was discharged with grade 2 strength in the lower limbs.

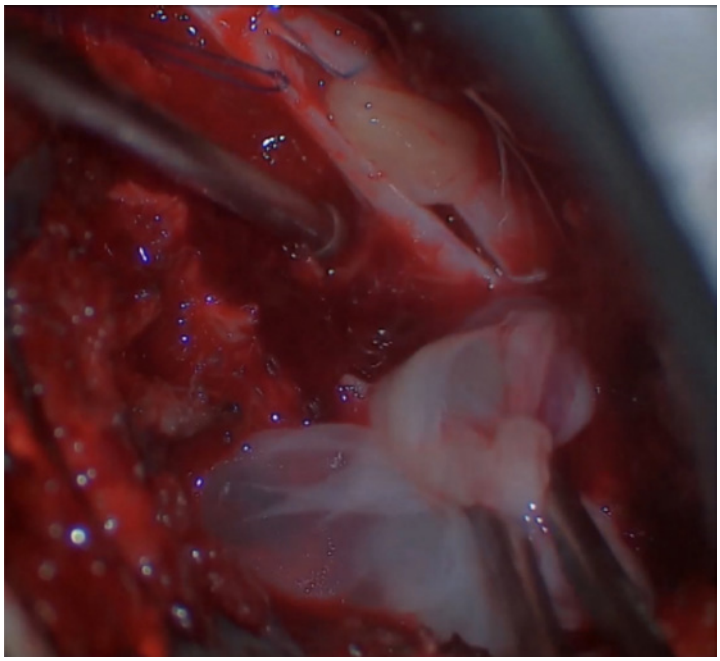
Figure 1 – Magnetic resonance imaging (MRI) of the thoracic spine with T2-weighted sequence in sagittal (left) and axial (right) sections, showing an intradural cystic lesion in the thoracic spine at the T4-T5 level.



Cerebrospinal fluid examination showed hyperproteinemia of 321 mg/dL and cellularity of 10/mm ^{3} with a predominance of lymphocytes. The test for IgG antibodies against cysticercus was positive in the cerebrospinal fluid. After multidisciplinary discussion, systemic therapy with dexamethasone and albendazole was initiated and surgical approach to the thoracic spinal cord injury was indicated. The patient underwent right hemilaminectomy at the T4-T5

level followed by right paramedian longitudinal durotomy. Multiloculated cystic lesions with apparent scolex inside were observed on microscopy (figure 2).

Figure 2 – Intraoperative microscopy showing visualization of the cysticercus and scolex.



The lesions also presented a valvular mechanism of extravasation of clear content with an "angel-shaped" appearance (figure 3) and associated adhesive arachnoiditis (figure 4).

Figure 3 – Intraoperative microscopy showing a lesion with a "papo-de-anjo" or pouch-like structure appearance.

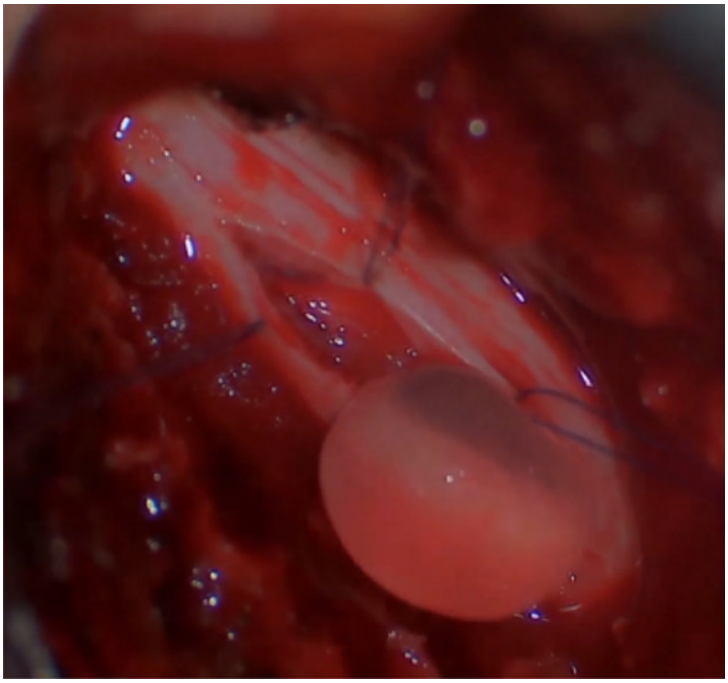
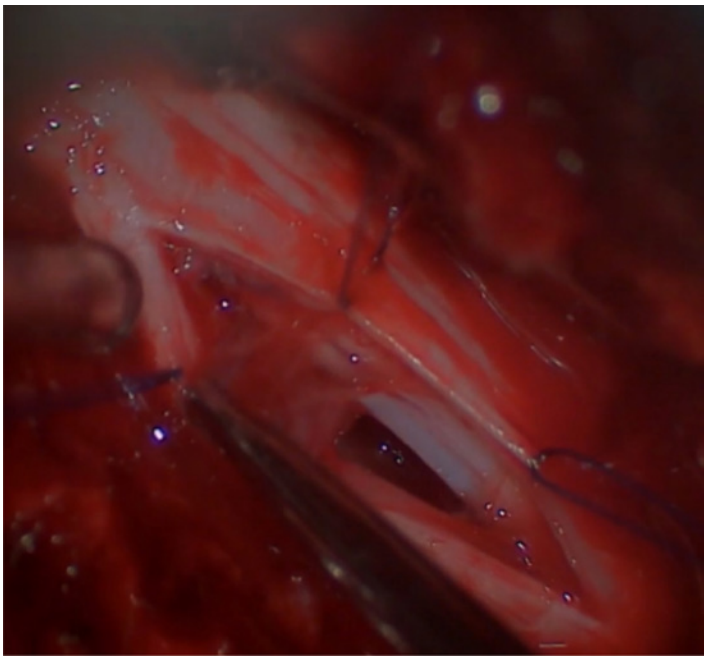


Figure 4 – Intraoperative microscopy highlighting an area of adhesive arachnoiditis.



The anatomopathological study confirmed the diagnosis of extraparenchymal neurocysticercosis. The patient evolved with partial improvement of the motor deficit and was discharged with grade 2 strength in the lower limbs.

DISCUSSION

Cysticercosis is caused by the larval stage of the Taenia solium worm. The disease is endemic in regions of Central America, South America, sub-Saharan Africa, India, and Asia. The clinical syndromes related to this parasite include neurocysticercosis and extra-neural cysticercosis, with the former being divided into intraparenchymal and extraparenchymal forms. Pigs serve as the intermediate host. The ingested eggs invade the intestinal mucosa of the pigs, enter the bloodstream, and then reach various organs and tissues, where they develop into cysticerci. The consumption of pork can lead to taeniasis. Human cysticercosis occurs through the ingestion of eggs released in feces that contaminate the external environment (fecal-oral route) [5–7].

The severity of neurological involvement depends on the affected region (cervical, thoracic, and/or lumbar), the degree of inflammation/arachnoiditis, and the involvement of nerve fibers. The diagnostic basis includes neuroimaging studies and the detection of antigens and antibodies in serum and cerebrospinal fluid. The gold standard is magnetic resonance imaging (MRI) or computed tomography (CT) [3,8].

The main imaging finding in parenchymal neurocysticercosis is a cystic lesion with ring enhancement and peri-lesional edema, which can also be seen in other conditions such as tuberculosis, pyogenic abscess, fungal granuloma, primary or metastatic tumor. Cystic lesions can also occur in echinococcosis and cenuriosis [6].

Diagnostic criteria are divided into absolute, imaging, and clinical-epidemiological criteria. The absolute criterion is direct visualization of the cysticercus in histopathological examination or demonstration of the scolex within a cystic lesion on imaging studies. Imaging criteria include cystic lesions, lesions with contrast enhancement, or intraparenchymal brain calcifications.

Clinical-epidemiological criteria include antigen tests, evidence of cysticercosis outside the central nervous system, close contact with an infected individual, and signs/symptoms [6].

The treatment of neurocysticercosis includes surgery, symptomatic therapy, and antiparasitic medications. Surgical treatment consists of cerebrospinal fluid shunts for hydrocephalus, cyst resections, and, more recently, endoscopic approaches. Symptomatic therapy is generally more critical in neurocysticercosis than in other infectious diseases, as it involves adjusting medications for controlling seizures and administering high doses of corticosteroids to manage inflammatory responses, focal neurological deficits, and intracranial hypertension. The main antiparasitic drugs are albendazole and praziquantel [3]. Although treatment regimens are not universally standardized, the use of albendazole at 15 mg/kg/day combined with dexamethasone at 0.2 mg/kg/day is recommended for patients with signs of spinal cord dysfunction, as in the case presented [1,4].

CONCLUSION

In the early 20th century, infections with T. solium were virtually eliminated from Europe through economic, educational, and sanitary changes, as well as improvements in the quality of medical, veterinary, and meat inspection services. Public health measures and community interventions that can contribute to disease control include promoting hand hygiene, food safety, safe handling of pigs, meat inspection, and treatment of human taeniasis [3,9].

Considering the risks, adverse effects, and failures of antiparasitic drugs, the importance of public health measures for the prevention and control of the disease becomes evident once again [3]. Sanitary conditions are closely related to neurocysticercosis, and combating this disease is a priority for the World Health Organization (WHO), being one of the seven neglected endemic zoonoses on their list [5].

Cases like the one presented are rare and highlight the importance of differential diagnosis of the lesion and early treatment to reduce the risk of complications and achieve a better final outcome, especially in endemic areas. Surgical intervention in cases of motor deficit without sensory level, even with ongoing anticoagulant therapy for venous thromboembolism, proved beneficial for the patient, considering the partial recovery in the immediate postoperative period and better long-term prognosis [4].

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