

Muscular Cysticercosis - Radiological Diagnosis

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Abstract

Cysticercosis is an infectious disease caused by ingesting the eggs of the tapeworm. The central nervous system is the most important primary site of infection, and the disease can present with solitary or multiple space-occupying lesions. It is known that muscular cysticercosis is not common, and further studies should be carried out to recognize and diagnose this parasite. Treatment can be clinical or surgical depending on each case. The muscular form has been a casual finding in radiological exams, demonstrating specific characteristics. The authors report a case with a diagnosis of muscular cysticercosis diagnosed in imaging tests, such as x-ray and CT scan.

Keywords: Radiography; Cysticercosis; Muscular Diseases

Abbreviations

CT: Computed Tomography

Introduction

Cysticercosis is a parasitic infection caused by the larval stages of the parasitic cestode *Taenia solium* [1]. It is considered an endemic zoonosis being distributed in developing countries, especially in rural areas [2].

Eggs enter the human intestine via fecal-oral contact through ingestion of food or water contaminated by eggs [3]. After the eggs are ingested, they hatch in the intestine, pass into the larval stage, and penetrate the intestinal wall [3]. Through the blood network, they go to striated muscles and the brain, liver, and other organs, where they develop in cysticerci [3]. Most important cases of cysticercosis with muscle involvement are associated with central nervous system involvement [3].

The central nervous system (CNS) is the most important primary site of infection, and the disease can present with solitary or

multiple space-occupying lesions [1]. The isolated intramuscular involvement of cysticercosis is uncommon [4].

The purpose is to demonstrate a case with muscular involvement of cysticercosis based on radiological exams.

Case Presentation

A 94-year-old man was brought to the emergency room within history of falling, presenting pain, functional disability and external rotation of the left lower limb. He reported left hip pain and an inability to bear weight. He had no prior history of hip pain and was ambulatory with the use of a cane. Also, He has chronic renal failure reporting abdominal pain for one day. The patient has been using a peritoneal dialysis catheter for one year and two weeks ago he had an accident with the handling of the system. Refers to a marked reduction in the amount of stool and abdominal discomfort. He reports having diabetes mellitus and systemic arterial hypertension with the continuous use of gliclazide, furosemide, carvedilol, ferri-polymaltose and sevelamer.

Physical examination of the left hip showed a positive log roll test and demonstrated pain with range of motion. The patient's left leg was flexed and shortened. The skin over the hip and thigh was intact with no abrasions, and the knee and ankle are non-tender, with pain-free range of motion. The leg is also neurovascularly intact with good sensation, capillary refill, and pulses in the foot. He also presents turbid and purulent dialysis fluid.

Pre-operative thorax x-ray demonstrated multiple calcifications throughout the thoracic musculature; enlargement of the heart, pulmonary opacity adjacent to the cardiac atria, and double lumen catheter in his superior vena cava. Pelvis x-ray demonstrating multiple calcifications throughout the thoracic musculature and a left neck femoral fracture. The thorax CT scan confirmed the multiple muscle calcifications. Those multiple multiple calcifications are diagnosis of muscle cysticercosis – diagnosis confirmed with the son of the patient after the imaging tests.

Adequate pain relief is achieved with tramadol and dipyrrone. It is decided to have the patient proceed to surgery on the next day of admission because of the improved mobility and mortality outcomes associated with early surgery. The patient undergoes cemented bipolar hemiarthroplasty, and postoperatively progresses to Intensive Care Unit and died on the third day after surgery.

Discussion

Cysticercosis is commonly seen at extra-cranial locations and often manifests with several usual and uncommon patterns [5]. Typical imaging morphology of cysticercosis is less common at extra-cranial locations as compared to intra-cranial sites and probably accounts for diagnostic delays [5]. When the parasite infects humans, its preferred locations are [3]

- The central nervous system, in 70% to 80% of cases
- Eyeball, in 18% to 20% of cases
- Skin, in 10% to 12% of cases
- Muscles, in 5% to 6% of cases.

There are three different clinical manifestations of muscular cysticercosis: myalgia, nodular or mass type, and pseudohypertrophic type - in this case, the formation of multilocular cysts occurs in the muscle group, which are normally oriented in the direction of the muscle fiber [4].

The diagnosis of intramuscular cysticercosis is often delayed and missed due to nonspecific clinical presentations [3]. Most patients with muscular cysticercosis are asymptomatic [3]. Pain, muscle weakness, paresthesia of the lower limbs, and joint effusion may occur [3].

Radiological evaluation is often necessary to establish an early diagnosis [4]. The diagnosis of intramuscular cysticercosis can be clinically difficult, with several differential diagnoses such as [4]

- Lipomas
- Epidermoid cysts
- Neuromas
- Neurofibromas
- Pseudoganglia
- Sarcoma
- Myxoma
- Pyomyositis
- Cold abscess
- Tuberculous lymphadenitis.

On ultrasonography, cysticercosis usually appears as a cyst with an eccentric echogenic scolex [4]. Follow-up ultrasound is performed after three weeks of anthelmintic medication to look for resolution of the lesion [6]. Cysts containing scolex in the central nervous system are diagnosed on MRI [4]. Computed tomography may be the test of choice for muscle cysts, as it can demonstrate multiple cysts in a honeycomb or leopard skin pattern [3]. When calcified, cysts appear as calcifications in the imaging tests [4].

The treatment of intramuscular cysticercosis depends if the patient has symptoms. Especially if there is pain or a local inflammatory process [3]. If there is a disease in soft tissues, the treatment will depend on the location of the cysts [6]. Surgical excision is performed for isolated skeletal muscle or soft tissue cysticercosis associated with abscess [6,7]. Cysts which are not associated with abscess can be treated with anthelmintic drugs such as albendazole or praziquantel [6,7].

The use of corticosteroids or other agents to suppress or prevent the host's immune response can be considered [1]. Diagnostic tests include radiological tests, serology, and tissue biopsy [1].

Medical treatment with albendazole and praziquantel (50 mg/kg for 14 days) are recommended for neurocysticercosis and subcutaneous cysticercosis. However, praziquantel does not affect calcified parasites [1]. Preventive measures are valuable and include thoroughly cooking the pork and all vegetables and early detection with complete removal of the worm [1].

Figure 1: In A, anteroposterior thorax x-ray demonstrating multiple calcifications throughout the thoracic musculature; enlargement of the heart, pulmonary opacity adjacent to the cardiac atria, and double lumen catheter in his superior vena cava. In B, anteroposterior pelvis x-ray demonstrating multiple calcifications throughout the thoracic musculature and a left neck femoral fracture.

Figure 2: In A, axial section thorax CT scan demonstrating multiple muscle calcifications and calcified atheromatous plaques in the aorta. In B, axial section abdominal CT scan demonstrating multiple muscle calcifications and calcified atheromatous plaques in the aorta.

Conclusion

Although cysticercosis is a more prevalent disease in tropical and less developed countries, its early diagnosis cannot be neglected. Its clinical-radiological characteristics must be investigated, appropriating all available resources. Correct diagnosis and adequate treatment reduce unnecessary time and expenses, avoiding errors and reducing morbidity and mortality caused by this parasite. Investigation based on imaging tests is crucial for the diagnosis of the

disease. Both surgery and clinical treatment have good results, but each case has to be individualized.

Acknowledgment

Not applicable.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Patient Consent

The written informed consent of the patient was obtained, for the publication of her case.

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