

Subcutaneous cysticercosis: a rare case series with review of literature

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Abstract

Taenia solium is a common parasitic infection. Cysticercosis can affect various organs, including the brain, spinal cord, orbit, muscle, subcutaneous tissue and heart. Hence, the clinical syndromes caused by *Taenia solium* are categorized as either neurocysticercosis (NCC) or extra-neural cysticercosis.

Brain is the most common location accounting for 60-90% of all cases. Subcutaneous cysticercosis is a relatively rare entity and is often misdiagnosed clinically. About 54% of the patients present with subcutaneous nodules. This study includes case series of subcutaneous cysticercosis who were diagnosed only on excisional biopsy, which is the gold standard investigation.

This study is aimed to describe typical cases of 'subcutaneous cysticercosis involving the left upper back, left upper eye lid and anterior chest wall with specific histopathological findings. We have also discussed the role of other imaging modalities in a case of subcutaneous cysticercosis.

Keywords: Cysticercosis, Subcutaneous tissue, Biopsy.

Introduction

Commonly called the pork tapeworm, known from the time of Hippocrates. The name 'solium' - from the Latin solus means solitary because usually only a single worm is found in infected persons but rarely several worms may be seen, upto 25 or more. Human beings become occasional hosts of *Taenia solium* larvae (viable). The ova of pork tapeworm spread via the faeco-oral route.⁽¹⁾

The clinical manifestations vary, depending on the site of larval encystment, the cyst burden, and the host reaction.^(2,3) Subcutaneous cysticercosis is a relatively rare entity and is often misdiagnosed clinically. About 54% of the patients present with subcutaneous nodules.⁽⁴⁾ Clinically, soft tissue cysticercosis can be misdiagnosed as lipoma, epidermoid cyst, abscess, pyomyositis, tuberculous lymphadenitis, neuroma, neurofibroma, sarcoma, myxoma, ganglion or fat necrosis.^(5,6)

Case Report

Case 1: A 25 year old female presented in the surgical clinic with a small swelling on left side of upper back. On examination, swelling was approximately 3cm×2cm, arising from the subcutaneous tissue, non tender, mobile, soft to firm in consistency with well defined margins and temperature normal with surrounding skin. There was no similar swelling elsewhere in the body. Rest of the general examination was normal. Her dietary history revealed to be pure vegetarian. Serological investigations were normal whereas fine needle aspiration came out to be inconclusive. Excisional biopsy showed a cystic cavity containing the larval form: scolex with hooklets and suckers. Variable granulomatous reaction, inflammatory infiltrate with lymphocytes and

eosinophils, fibrosis and calcification was also seen (Fig. 1). The larval form was composed of duct-like invaginations, lined by a double layered, eosinophilic membrane. Its body wall exhibited a myxoid matrix and calcareous bodies (calcified concretions) (Fig. 2).

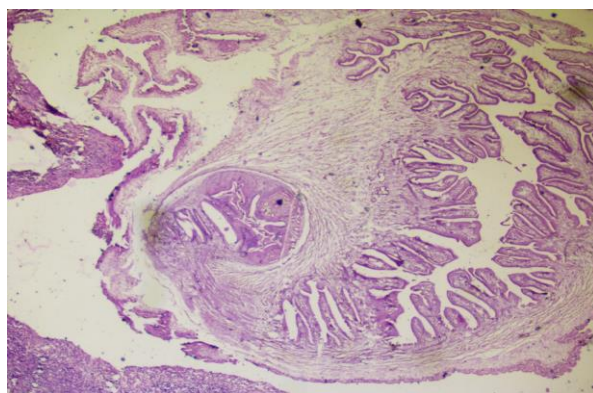


Fig. 1: On histopathology, the cystic cavity contains the larval form: scolex with hooklets and suckers. Variable granulomatous reaction, inflammatory infiltrate with lymphocytes and eosinophils, fibrosis and calcification may be seen. Haematoxylin and Eosin x 10X

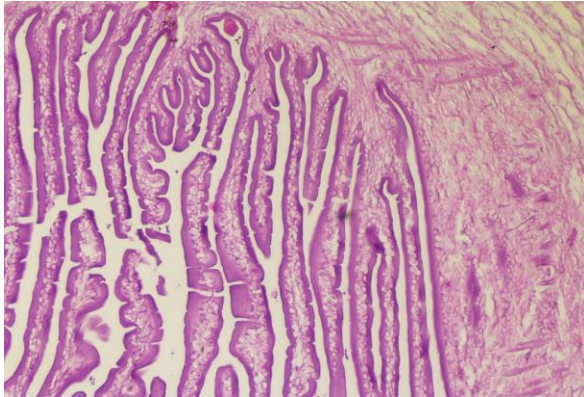


Fig. 2: Shows the larval form, composed of duct-like invaginations, lined by a double layered, eosinophilic membrane. Its body wall exhibits a myxoid matrix and calcareous bodies (calcified concretions). Haematoxylin and Eosin x 40X

Case 2: A 22 year old male presented to the ophthalmic clinic with a left upper eye lid nodule for the past 3 months. On examination, size of the swelling was 1.5×1cm, progressively increasing, without any redness or irritation. Rest of the ocular examination was normal with no significant past medical history. Dietary history revealed the patient to be a non vegetarian with history of pork consumption. He did not have any neurological symptoms or visual disturbances. CT scan head and ophthalmic examination were unremarkable. Neither sonographic evaluation nor FNAC was done. Clinically was diagnosed as angular dermoid and surgical excision was performed. Cysticercosis was diagnosed on histopathological examination.

Case 3: A 34 year old female presented to the surgical clinic with a swelling on anterior chest wall just inferior to the right mid clavicle for the past 1 month. On examination, swelling was 2×2cm, ovoid, soft, non-pulsatile, sessile, smooth surface with regular margin, and non fluctuant. The adjacent soft tissues were thickened and irregular, suggestive of edema. Breast examination and axillary lymph nodes were within normal limits with no history of breast carcinoma. Rest medical history was insignificant. Clinically was diagnosed as enlarged lymph node and fine needle aspiration yielded brownish serous fluid. Cytology showed tissue fragments composed of fibrillar material with interspersed small blue nuclei and a diagnosis of parasitic infection was made. An elective excision biopsy was performed. Histopathological examination revealed cysticercus cellulose parasite with an extensive mixed inflammatory cell infiltrate in the surrounding tissue with a final diagnosis of subcutaneous cysticercosis. The patient was also administered oral antihelminthic therapy.

Discussion

Human cysticercosis is caused by infestation of *Cysticercus cellulosae*, the larval form of *Taenia solium*

which results from eating food (undercooked pork or beef and raw vegetables) and water contaminated with viable eggs of *Taenia solium*.⁽⁷⁾ The perpetuation of this parasitic disease is related to poor sanitation and hygiene.⁽⁸⁾ As was seen in our patients, cysticercosis is equally common in vegetarians. Humans are the only definitive host in the lifecycle of *Taenia solium* (Step 1).^(9,10) Humans can become infected by consuming gravid proglottids either through feco-oral route or by autoinfection (Step 2).⁽¹⁰⁾ There is also a high risk of infection by reverse peristalsis resulting in internal regurgitation of the eggs into the stomach when the intestine harbours a gravid worm.⁽¹⁰⁾ The oncospheres penetrate the intestinal mucosa (Step 3) and develop into cysticerci after getting carried to various parts of the body including brain, eyes, striated muscles, liver, heart, lungs, peritoneum, breast and subcutaneous tissues. Ingestion of the undercooked pork containing these cysticerci is the exclusive path to the development of human intestinal *Taenia solium* tapeworms (Step 4). By means of a single scolex or head, these cysts attach to the small intestine (Step 5). Adult tapeworms develop and reside in the small intestine for a period varying from months to years (Step 6). Basically, all the clinical symptoms can be attributed to the vigorous granulomatous inflammatory reaction that occurs when the larvae die.^(11,12)

Cysticercosis is the most common parasitic disease of the central nervous system in the world, but cysticercosis cutis has been reported much less frequently.⁽⁴⁾ The infection is common in India, Africa, Mexico and South America.⁽¹³⁾ However, due to population dynamics, there has been an increase of cysticercosis cases reported from the non-endemic areas.⁽³⁾ In India, the first case of cutaneous cysticercosis was recorded by Campbell and Thomson in 1912.⁽¹⁴⁾

Subcutaneous cysticercosis is a relatively rare form of cysticercosis but should always be born in mind during evaluation of subcutaneous swellings. Most common presentation subcutaneous cysticercosis is lump with no predilection of site. Abdominal and chest wall lesions are seen less often.⁽¹⁵⁾ The diagnosis is relatively difficult to make solely on a clinical basis because the manifestations are not specific, and visualization of the organism usually is not feasible.⁽¹⁶⁾ Haematological profile often remains unaltered. Occasionally eosinophilia may be noted when there is leakage of parasitic antigen into surrounding tissues.⁽¹⁷⁾ However, sensitivity of serological tests tends to be high for patients with multiple cysts (94%), but substantially lower for patients with a single cyst or calcified cysts (28%).⁽¹⁸⁾ False positivity is expected with the past parasitic infection or cross-reactivity with other helminths.⁽¹⁹⁾ High-resolution sonography can clinch the diagnosis by demonstrating presence of a scolex within the cyst.⁽¹⁾ In typical cases with a cyst containing a scolex within and with a surrounding

abscess, high resolution ultrasound should always be the primary mode of diagnosis.^(1,4) It was not done in any of our patients as the diagnosis of subcutaneous cysticercosis was not suspected. Computed tomography (CT) and magnetic resonance imaging (MRI) scans are the other imaging modalities used for evaluating subcutaneous cysticerci, though sensitive in diagnosing cysticercosis in cases where the parasite involves the CNS, are very expensive, and they provide only supportive diagnosis.^(1,4)

On histopathology, the cystic cavity contains the larval form: scolex with hooklets and two pairs of suckers.^(11,12) The larval form, composed of duct-like invaginations, is lined by a double layered, eosinophilic membrane. Its body wall exhibits a myxoid matrix and calcareous bodies (calcified concretions). Birefringent hooklets may be identified. Variable granulomatous reaction, inflammatory infiltrate with lymphocytes and eosinophils, fibrosis and calcification may be seen.⁽¹¹⁾

By and large cysticercosis is preventable, treatable and potentially eradicable disease entity. Conversely, delayed intervention may be associated with significant degree of morbidity and mortality.

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