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## CASE REPORT

### A Young Man in a Rural Breast Clinic

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#### Abstract

This article reports a case from Rwanda of muscular cysticercosis presenting as a painful "breast" lump in a young male patient. Sonographic evaluation revealed a hypoechoic mass deep to the breast tissue likely within the pectoralis muscle, rather than the breast. Subsequent excisional biopsy resulted in the diagnosis of cysticercosis.

#### Introduction

Cysticercosis is caused by the larval stage of the tapeworm *Taenia solium*. It is transmitted by the ingestion of the eggs of the *Taenia solium* tapeworm shed in the stool of a human tapeworm carrier. This usually happens when people eat contaminated food or contaminated water or by handling food or placing contaminated fingers in the mouth. Ingestion of the eggs can result in deposition of the tapeworm larvae in a wide range of tissues including muscle, skin, eyes, and the central nervous system of the host. The manifestations that most frequently lead patients to visit health care providers are caused when cysts develop in the brain, a condition referred to as neurocysticercosis. Neurocysticercosis is the most common cause of acquired epilepsy in endemic settings and most commonly presents as seizures and increased intracranial pressure. Extranural cysticercosis is common but is likely underestimated as it is often asymptomatic. Extranural cysticercosis most commonly involves muscle or subcutaneous tissues.

*Taenia solium* has a scolex or head with four suckers and a double crown of hooks. Suckers and hooks are used to attach itself to its host. Following ingestion, embryos hatch in the host's small intestine, invade the bowel wall, and disseminate hematogenously. Over a period of 3-8 weeks, tissue cysticerci develop, consisting of membranous walls filled with fluid and an invaginated scolex.

Cysticercosis is the most common parasitic disease worldwide and is endemic in Mexico and in countries of Central and South America, Africa, and Asia. Although it can occur in any tissue, it is not a common diagnosis in a man presenting to a breast clinic. This report illustrates one such case from Rwanda where a young man presented with a palpable "breast" lump.

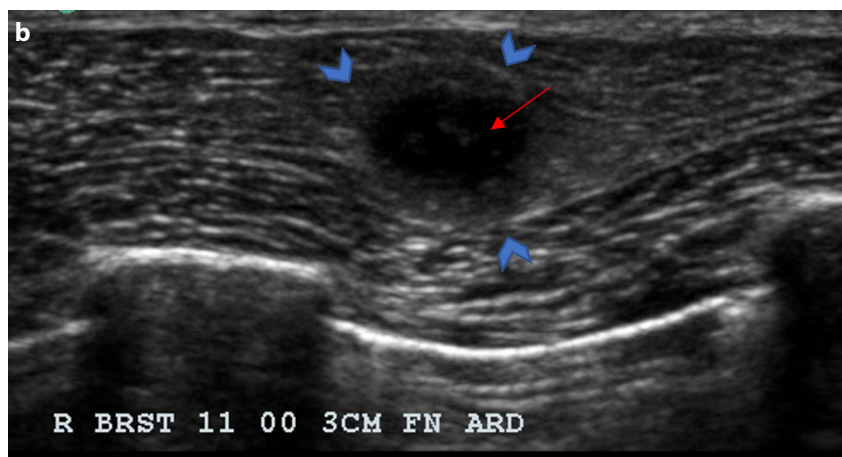
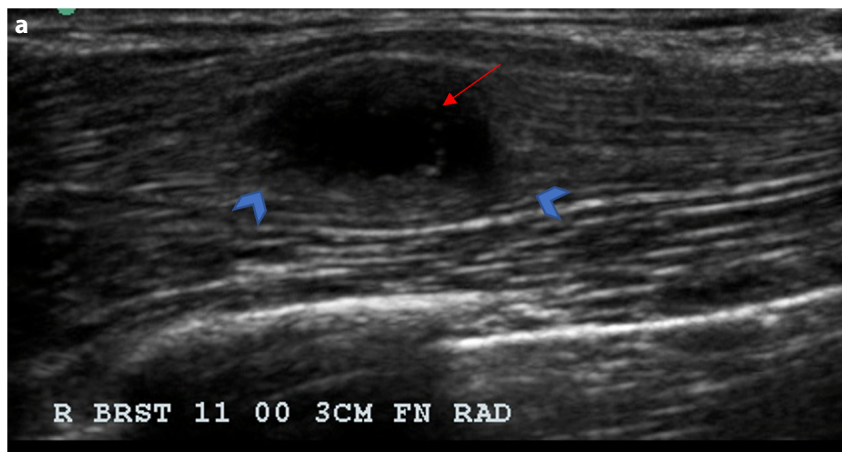
#### Case report

A 26-year-old man presented to the breast clinic with a painful right breast lump that had waxed and waned over the course of two months. On physical exam, there was a palpable, tender right breast mass. The mass was mobile and not firm. There were no overlying skin

changes, nipple retraction, or axillary lymphadenopathy.

Targeted ultrasound at the site of the palpable finding demonstrated a small oval markedly hypoechoic mass with microlobulated margins and sparse internal echoes. It was interpreted as a complex cystic mass with minimal solid component, possibly representing a small hematoma, fat necrosis, abscess, or a mass of other etiology. It was noted that this mass was located not within breast tissue but within the pectoralis muscle (Figure 1). Due to the location within the muscle, aspiration and percutaneous needle biopsy were thought to not be the optimal management approach. Instead, surgical consultation was recommended. Subsequent surgical excision revealed soft tissue cysticercosis.

**Figures 1a and 1b.** Radial (a) and antiradial (b) US images of the palpable lump in the right breast at 11:00, 3 cm from the nipple show an irregular cystic mass with few internal echoes (arrow). There is mild surrounding edema (arrowheads), and no posterior acoustic shadowing. Note that the mass is actually within the pectoralis muscle.



## Discussion

Cysticercosis is endemic in many developing countries and is a major health problem worldwide. Clinical manifestations vary depending on the site of larval encystment. The breast parenchyma is an uncommon site of involvement occurring in 8% of cases in one study in Nepal and in <1% of cases in a study in India (1, 2). Reportedly muscle involvement including that of the chest wall is common (3). This case highlights the importance of identifying the location of a lesion within the chest wall musculature versus the breast as this changes the differential diagnosis. The sonographic differential diagnosis of a mass in the chest wall musculature whether cystic or solid includes trauma-related mass such as hematoma, fat necrosis or degenerative calcifications; abscess, lipoma, sarcoma, myxoma, neurofibroma, and neuroma. The differential diagnosis of a mass in the male breast includes gynecomastia, benign masses and primary breast malignancy.

In the muscular form of cysticercosis, the *Taenia solium* larvae encyst within muscle and can remain dormant but viable for years, evading immune recognition. Thus, muscular cysticercosis can remain asymptomatic as no inflammation is elicited by the living larvae. However, when cysticerci degenerate and larvae die, a vigorous inflammatory response is incited causing symptoms. The main symptoms in muscular cysticercosis are pain, swelling, and a palpable lump. There are four described clinical manifestations of muscular cysticercosis: (1) myalgic or myopathic type (2) nodular or mass-like type, (3) abscess-like, and (4) pseudo-hypertrophic type. In the myalgic type, larval death incites an inflammatory reaction causing pain. In the other types, the cyst encasing the larvae degenerates and leaks fluid intermittently into the surrounding tissues causing a chronic inflammatory reaction (4).

Ultrasound is a very helpful tool in the diagnosis of soft tissue cysticercosis as it is relatively inexpensive and readily available worldwide compared to CT and MRI, and it is radiation-free. There are various sonographic appearances of muscular cysticercosis described in the literature. The most common and classic sonographic appearance is a cyst containing an eccentric linear or round echogenic structure attached to its wall

representing a scolex. There may be a surrounding fluid collection representing reactive fluid or an abscess. Another less common and less specific sonographic appearance is a cyst without a scolex with surrounding fluid and edema. Muscular cysticercosis can also present as multiple small millet seed-shaped calcifications within the muscle representing calcified cysticercosis (4, 5). Our case shows a cystic mass without a definite scolex, with surrounding edema but no surrounding fluid. This patient had no other palpable sites of involvement and no other imaging was performed.

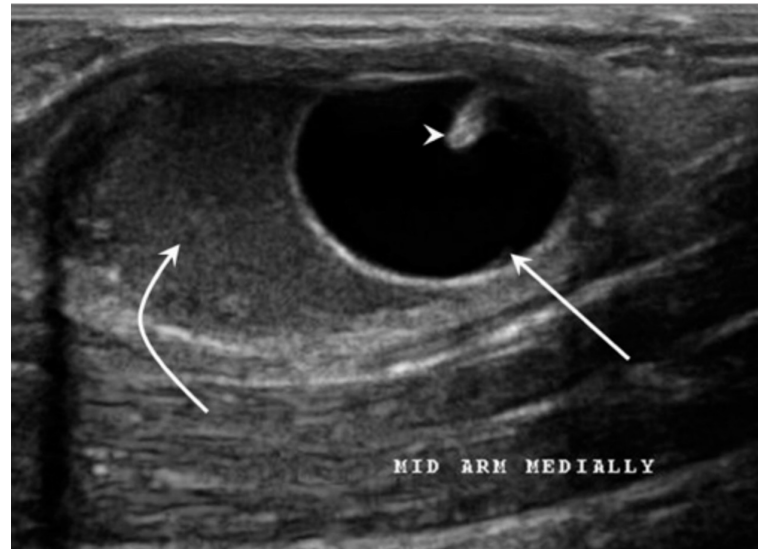
To illustrate the sonographic appearance of soft tissue cysticercosis, we are including exemplary images from a previously published article (Naik D, Srinath M, Kumar A. Soft tissue cysticercosis - Ultrasonographic spectrum of the disease. *Indian J Radiol Imaging*. 2011;21(1):60–62. doi:10.4103/0971-3026.76059, distributed under the terms of the Creative Commons Attribution License) (Figures 2-4).

MRI can be helpful in diagnosing the presence and location of infection. MRI will show a round or oval lesion that is hypointense on T1-weighted images and hyperintense on T2-weighted images with a well-defined wall within the muscle. The scolex is less well seen on MRI compared to US. If visible, the scolex will be intermediate to low signal intensity on T2-weighted images and intermediate signal intensity on T1-weighted images. Enhancement of the cyst wall and scolex can be seen. The degree of surrounding soft tissue edema varies (6). CT is not very useful in the diagnosis or characterization of muscular cysticercosis.

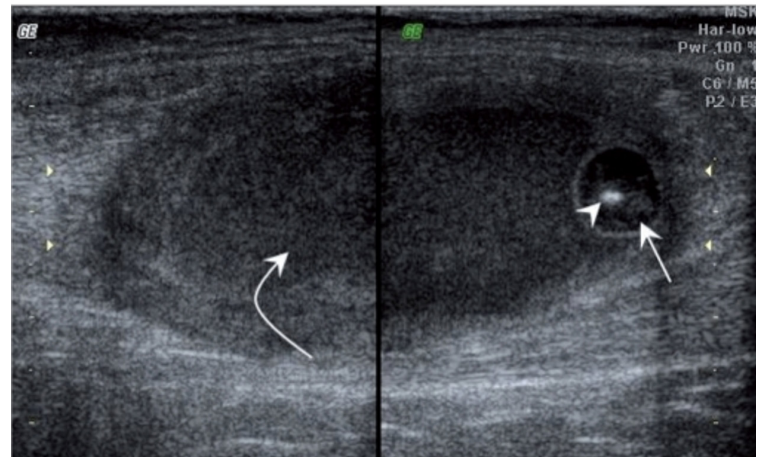
Diagnosis can be confirmed with fine-needle aspiration or biopsy which will show hooks, scolex, and fragments of the spiral wall of the larvae (7). Lesions can be solitary or multiple. Treatment options include antihelminthic agents like albendazole and praziquantel in conjunction with steroids. Excision may be required, particularly in solitary lesions with surrounding abscess.

Other parasitic infections which can occur in the chest wall and breast include filariasis, caused by one of several thread-like round worms, most commonly *Wuchereria bancrofti* and *Brugia malayi*. Filariasis is transmitted to humans through a mosquito bite depositing the larval form of the parasite. Another parasitic infection is dracunculiasis, caused by ingestion of water contaminated with fleas carrying the larvae of *Dracunculus medinensis*, also known as the guinea worm, medina worm, and dragon worm. The larvae

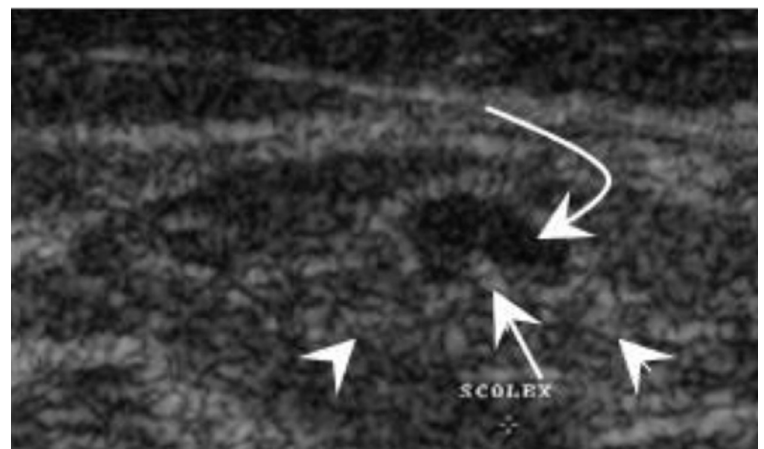
**Figure 2.** US shows a cyst (arrow) with a scolex (arrowhead) and surrounding abscess (curved arrow). Copyright © Indian Journal of Radiology and Imaging, doi:10.4103/0971-3026.76059. Re-used under the terms of the Creative Commons Attribution License.



**Figure 3.** US shows a cyst (arrow) with a scolex (arrowhead) and surrounding abscess (curved arrow). Copyright © Indian Journal of Radiology and Imaging, doi:10.4103/0971-3026.76059. Re-used under the terms of the Creative Commons Attribution License.



**Figure 4.** US shows a cyst (curved arrow) with scolex (arrow) within and surrounding edema (arrowhead). Copyright © Indian Journal of Radiology and Imaging, doi:10.4103/0971-3026.76059. Re-used under the terms of the Creative Commons Attribution License.



of both filariasis and guinea worm have a propensity for lymphatic channels in the body, and both will show small, serpiginous calcifications in a non-ductal distribution on mammography. In filariasis, ultrasound may show non-rhythmic, non-pulsatile mixed red blue color Doppler signal from irregular worm movement known as the “filarial dance” (8-11).

## Conclusion

Cysticercosis is a parasitic infection that is commonly seen in developing nations. Ultrasound is a useful tool for the diagnosis of soft tissue cysticercosis. This case emphasizes that cysticercosis should be considered in the differential diagnosis of a “breast” lump particularly in endemic areas. Correctly recognizing the cyst to be within the muscle rather than the breast is key to the diagnosis.

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