

SHORT COMMUNICATION

Isolated cysticercosis of the breast masquerading as a breast tumour: report of a case and review of literature

Cysticercosis (*Cysticercus cellulosae*) is a zoonotic disease caused by the larval form of the nematode *Taenia solium* or pork tapeworm. Humans harbour the tapeworm in the intestine and are the definitive hosts in the parasite's life cycle. Infection occurs after ingestion of undercooked pork or by ingestion of its eggs in contaminated food or water. Cysticercosis is a public health problem and is endemic in several developing countries of Asia, Central Africa and South America (Rajshekhar *et al.*, 2003; Prasad *et al.*, 2008). However, due to frequent migration and changes in travel patterns, it is now increasingly seen in developed nations also (Prasad *et al.*, 2008). The commonest site for cysticercosis is the central nervous system. Involvement of the breast is extremely rare (Chi and Chi, 1978) and only a few cases are reported. In the breast, this parasite presents as a lump. Due to the rarity of the condition, these lumps are often mistaken for other common pathologies, such as cyst, fibroadenoma, or even carcinoma posing serious concern. We report here a case of an isolated cysticercosis of the breast masquerading as breast tumour, along with a brief review of the reported cases in the literature.

PATIENTS AND METHODS

The patient was a 54-year-old female, a strict vegetarian from a middle class family of New Delhi, India. She presented with a breast lump in the lower inner quadrant of her left breast for 3 months. The lump was 2 × 2 cm in size, hard in consistency, had an irregular surface and was free from the overlying skin and the underlying muscle. It was non-tender and the bilateral axillae were normal. Her

eosinophil count and erythrocyte sedimentation rate were normal. There was a small dot-like calcification with a surrounding halo in the mammogram (Fig. 1). The ultra-sonography of the breast showed a well-defined round cyst within a collection and a brightly echogenic protrusion from the wall. Fine needle aspiration showed clear fluid, the cytology of which revealed macrophages and eosinophils. Due to the suggestive radiological and cytological findings and with the patient being from an endemic region, a possible diagnosis of parasitic infestation was made. The computed tomographic scan of her brain and the ophthalmic examination were normal. Routine microscopy of her stool revealed no parasites. She was subjected to wide local excision of the breast lump. The cut section showed a fluid-filled bladder-like structure in the centre of the lump (Figs. 2 and 3). The histo-pathological examination confirmed the diagnosis of cysticercosis (Fig. 4). She was advised albendazole tablet 400 mg daily for 2 weeks.

DISCUSSION

Here we have presented a case of isolated cysticercosis of the breast. Although cysticercosis is not a rarity in our region, its presentation as a breast lump is exceptional. Only a few cases are reported in the literature. An overview of 13 published reports and the present case is presented in the Table. In the present case, it was clinically mimicking a breast tumour. However, being in an endemic area, our radiologist and the pathologist had a high index of suspicion for a parasitic lesion. This high index of suspicion and awareness were the key to make the probable

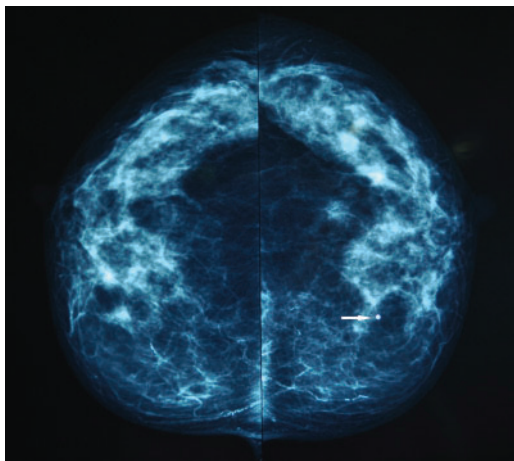


FIG. 1. The mammogram of the left breast showed a dot-like calcification (arrow) with a surrounding halo. On comparing the surgical specimen with the mammogram, this calcified dot corresponded to the scolex and the halo to the cyst wall.

pre-operative diagnosis of a parasitic breast disease.

Due to the rarity of the disease, there is no detailed description of the mammographic or ultra sonographic appearances of breast cysticercosis. Sinha *et al.* reported a case with mammographic appearance of a small high-density lesion with round well-defined margins. There was no specific feature to suggest parasitic infestation in their case (Sinha *et al.*, 2008). Lucarelli *et al.* reported a tubular worm-like appearance suggestive of calcified larvae in the intermuscular area

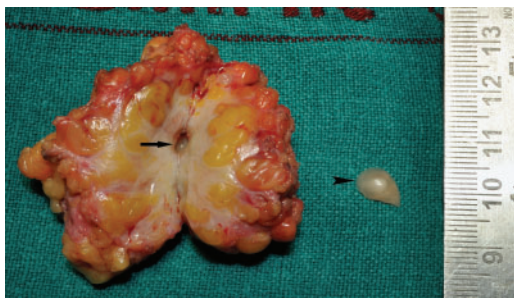


FIG. 2. The cut section of the breast lump revealed the larva in the centre of the lump with surrounding fibrosis. The empty cavity (arrow) is seen in the centre of the lump after the larva (arrow head) had been removed from it.

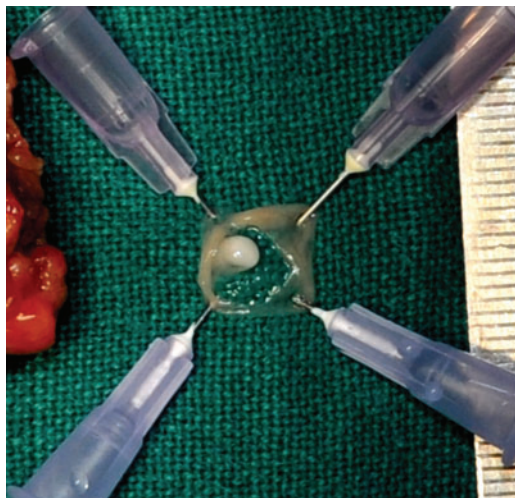


FIG. 3. The larva is split open. The pearly white structure is seen protruding from the wall of the larva to its lumen. It was 2 × 3 mm in size, firm in consistency and had smooth glistening surface.

of the pectoral major (Lucarelli *et al.*, 2008). In our case, the architecture of the breast parenchyma was well preserved. There was a small dot-like calcification with a surrounding halo in the mammogram. On comparing the surgical specimen with the mammogram, this calcified dot corresponded to the scolex and the halo to the cyst wall.

Vijayaraghavan described four different types of sonographic appearances for soft tissue cysticercosis (Vijayaraghavan 2004). These are: (1) well-defined round cyst

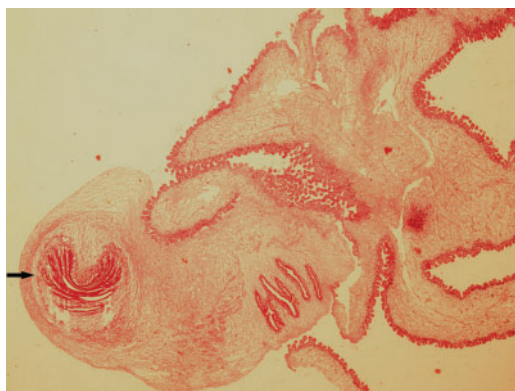


FIG. 4. The microscopic appearance of the parasite. The characteristic scolex (arrow) is seen at the cephalic end of the parasite (haematoxylin and eosin stains, × 40 magnification).

TABLE. An overview of 13 published reports and the present case

Authors	Age (years)	Presentation	FNAC	Imaging	Treatment	Histopathology
Lucarelli <i>et al.</i> , 2008	63	Breast-WNL	...	CT scan brain: two well-defined lesions in the brain similar to <i>T. solium</i> larvae Mammogram: tubular, worm-like structure suggestive of calcified larvae in the intermuscular area of the pectoral major of left breast Mammogram: a small high-density lesion with round, well-defined margins in the upper outer quadrant Ultrasound: an anechoic lesion with a central hyperechoic focus, consistent with a scolex	Excision followed by albendazole	Characteristic scolex, with four suckers and a double row of hooks
Sinha <i>et al.</i> , 2008	65	Painless, mobile lump (1 × 1 cm) in the left breast	...	...	Excision biopsy	...
Agnihotri <i>et al.</i> , 2006	22	Non-tender lump on right breast	...	...	Excision biopsy	Three-layered wall of the cysticercus. Multinucleated giant cells and foreign body granulomas in the wall of the cyst
Conde <i>et al.</i> , 2006	26	Painless, mobile mass (2.0 cm) in the right breast	...	Ultrasonography: an oval nodule with circumscribed margins, hypoechoic homogeneous content and posterior enhancement	Resection of the mass	Cystic cavity containing larvae, consistent with cysticerci
Sah <i>et al.</i> , 2001	25	Painless, mobile, firm lump (3.5 × 2.5 cm) on right breast	...	...	Excision biopsy	Main mass consistent with fibroadenoma, inside which there was a nodule containing scolex with feature of cysticercous cellulose Cysticercus
Sahai <i>et al.</i> , 2002	22	Breast lump, 2 × 1 cm	Clear, acellular fluid	...	...	...

TABLE. Continued

Authors	Age (years)	Presentation	FNAC	Imaging	Treatment	Histopathology
	43	Breast lump, 1.5 × 1 cm	Eo, AIE, palisading histiocytes, cysticercus	...	...	...
	35	Breast lump, 1 × 1 cm	Cysticercus	...	...	...
	30	Breast lump, 1 × 1 cm	Eo, AIE, palisading histiocytes, cysticercus	...	...	...
	30	Breast lump, 1.5 × 2 cm	Few polys, Eo, cysticercus	...	...	...
	32	Breast lump, 2 × 2 cm	Eo, AIE, palisading histiocytes, cysticercus	...	...	...
	42	Breast lump, 1 × 1.5 cm	Eo, AIE, palisading histiocytes, degenerating cysticercus	...	...	...
	16	Breast lump, 2 × 2 cm	Few polys, cysticercus	...	...	...
	49	Breast lump, 3 × 3 cm	Few polys, Eo, palisading histiocytes, cysticercus	...	...	...
	45	Breast lump, 2 × 3 cm	Eo, AIE, palisading histiocytes, cysticercus, BDC	...	...	...
	35	Breast lump, 2 × 2 cm	Eo, AIE, palisading histiocytes, FBGC, cysticercus	...	...	...
	30	Breast lump, 4 × 3 cm	Palisading histiocytes, cysticercus	...	...	...

TABLE. *Continued*

Authors	Age (years)	Presentation	FNAC	Imaging	Treatment	Histopathology
	30	Breast lump, 2 × 3 cm	Eo, AIE, palisading histiocytes, cysticercus	...	...	...
	49	Breast lump, 2 × 3 cm	Eo, AIE, palisading histiocytes, degenerating cysticercus infiltrated by polys, calcareous corpuscles	...	...	...
	15	Breast lump, 2 × 3 cm	Few polys, palisading histiocytes, cysticercus	...	...	...
	14	Breast lump, 3 × 3 cm	AIE, degenerating cysticercus infiltrated by polys	...	...	...
Amatya and Kimula, 1999*						
Kapila and Verma, 1996 [†]						
Vuong, 1989	30	Breast mass, 2 cm	Inflammatory cells mixed with spiked spherules	...	Excision biopsy	Scolex with four large suckers
Alagaratnam <i>et al.</i> , 1988	43	Breast lump, 0.5 cm	No cellular elements	...	Excision biopsy	Rostellum bearing hooklets
Kunkel and Hawksley, 1987	25	Well-demarcated breast mass, 1 cm	...	...	Excision biopsy	Parasite with an invaginated scolex
Leggett, 1983	29	Breast lump, 1.5 cm	...	...	Excision biopsy	Scolex with hooklets and suckers
Chi and Chi, 1978 [‡]						

TABLE. Continued

Authors	Age (years)	Presentation	FNAC	Imaging	Treatment	Histopathology
Bhattacharjee et al., 2011	54	Painless, hard, breast lump, 2 × 2 cm	Clear fluid, the cytology of which revealed macrophages and eosinophils	Mammogram: small dot-like calcification with a surrounding halo Ultrasoundography- well-defined round cyst within a collection and a brightly echogenic protrusion from the wall	Wide local excision followed by albendazole	Scolex at the cephalic end of the parasite

WNL, within normal limit; AIE, acute inflammatory exudate; BDC, benign ductal cells; Eo, eosinophils; FBGC, foreign body giant cells; polys, polymorphonuclear leucocytes.

*The paper document five cases of cysticercosis of the breast among 23 402 biopsy specimens examined over 5 years; no detailed data of these particular cases were presented.

†The paper represents the first eight cases of Sahai et al. (2002).

‡This paper reported 191 cases of cysticercosis, of which seven cases were seen in the breast. No details of the individual cases were presented.

within a collection, with a brightly echogenic protrusion from the wall; (2) loculated collection of fluid with internal echoes with a well-defined round cyst within, with an eccentric echogenic protrusion from the wall, representing the scolex; (3) irregular cyst with minimal fluid collection on one side with an extruded scolex in it; and (4) elliptical calcified cysticercus cysts. Our case had the imaging appearance as described in type 1 cyst.

Although the radiological findings were suggestive of the benign nature of the disease, we went ahead with wide local excision of the lump. This was carried out to obtain a definitive diagnosis as well as to remove the fear of malignancy from the patient's mind.

The definitive diagnosis of cysticercosis is based on the characteristic features of the cephalic extremity of the parasite. In our case, the fine needle aspiration showed clear fluid and the cytology showed only eosinophils and macrophages. The presence of inflammatory cells mixed with spiked spherules may suggest the presence of encysted flat worms, but is not specific of cysticercosis (Vuong, 1989). Fine needle aspiration cytology could be diagnostic when a fragment of cysticercus is seen on the aspirate (Kapila and Verma, 1996; Sahai et al., 2002). In our case, the final histo-pathological examination demonstrated the scolex at the cephalic extremity of the parasite with characteristic suckers and the hooks, which were diagnostic.

Another interesting aspect of our case was that she was a pure vegetarian. She had probably ingested the eggs of *T. solium* through the contaminated food or water. The apparent implication of this is the inadequacy of public health measures.

In conclusion, cysticercosis of the breast is rare. However, it should be kept in the differential diagnosis of breast lumps, especially in endemic areas. Clinically, it may mimic a breast tumour. Imaging features are helpful in pre-operative diagnosis. Definitive diagnosis is possible after the histological examination of the parasite. Due to wide-spread travel of people between countries and

continents, the clinician should be aware of this rare but potentially serious breast disease.

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