Original Research

A HIDDEN PARASITE IN THE BREAST: A RARE CASE OF MAMMARY FILARIASIS

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ABSTRACT
Lymphatic filariasis, caused primarily by *Wuchereria bancrofti*, is a common parasitic infection in tropical regions such as India, yet its manifestation in the breast remains exceedingly rare. We report the case of a 38-year-old female who presented with a gradually progressive, non-tender breast lump localized to the upper outer quadrant of the right breast. Clinical and radiological evaluations suggested a benign cystic lesion. Fine needle aspiration cytology (FNAC) revealed the presence of microfilariae in a background of mixed inflammatory infiltrate, leading to a diagnosis of breast filariasis. Subsequent histopathological examination confirmed a benign cystic lesion with chronic inflammation. The patient had no peripheral eosinophilia or systemic symptoms, underscoring the incidental nature of the finding. This case highlights the importance of maintaining a high index of suspicion for parasitic infections in endemic areas, even in the absence of classical features, and demonstrates the diagnostic value of FNAC in identifying uncommon presentations of filariasis that may mimic neoplastic conditions.

INTRODUCTION
Filariasis, a parasitic infection caused by nematodes of the *Filarioidea* family—primarily *Wuchereria bancrofti* and *Brugia malayi*—continues to be a significant public health concern in tropical and subtropical areas, especially in countries like India. Transmitted via the bite of infected *Culex* mosquitoes, the disease thrives in both rural and urban environments where poor sanitation and socioeconomic challenges facilitate its spread [1].
Despite its wide prevalence, lymphatic filariasis presents with a broad spectrum of clinical manifestations. Interestingly, many infected individuals remain asymptomatic for years, unknowingly acting as carriers and contributing to ongoing transmission. The adult worms typically settle in the lymphatic system, while their offspring—microfilariae—circulate in the bloodstream, often demonstrating nocturnal periodicity [2].

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This nighttime activity of the microfilariae complicates detection, as standard diagnostic tools like peripheral blood smears and fine needle aspiration cytology (FNAC) may fail to identify them, even in high-risk regions [3].
While the disease commonly affects the lower limbs, spermatic cord, epididymis, and lymph nodes, microfilariae have occasionally been discovered in unusual locations. These include the thyroid gland, bone marrow, pleural and pericardial fluids, and even the breast [4,5]. Finding microfilariae in breast cytology is particularly rare and typically incidental, posing a diagnostic dilemma as it may mimic both benign and malignant breast conditions [6].
In this context, we report a rare and intriguing case of microfilariae detected during the FNAC of a breast lump in a 38-year-old woman from an endemic region. This case underscores the critical need for comprehensive cytological evaluation and highlights the importance of considering parasitic infections when diagnosing breast lesions.

Case report
A 38-year-old woman presented to the General Surgery outpatient clinic at Era's Lucknow Medical College and Hospital (ELMCH), Lucknow, with a slowly enlarging lump in her right breast. The swelling had been present for about a year and was noted to become painful during her menstrual periods, although it did not change in size

throughout the cycle. She had no history of nipple discharge, fever, redness of the skin, or any systemic complaints.

Clinical examination revealed a single, soft, mobile, non-tender lump measuring approximately 2.5 × 2.5 cm, located in the upper outer quadrant of the right breast. There was no evidence of axillary lymphadenopathy or skin changes. A thorough systemic evaluation showed no abnormalities.

Routine blood tests were unremarkable: hemoglobin was 14.3 g/dL, hematocrit 44.1%, and total leukocyte count 6400/mm³, Differential leucocyte count Neutrophils-59%, Lymphocytes - 30 %, Eosinophils - 10% , Monocytes -01% . Breast ultrasonography revealed a well-circumscribed, round, anechoic lesion consistent with a benign cyst. Given these findings, the patient was referred to the Pathology Department for further evaluation using fine needle aspiration cytology (FNAC).

FNAC of the lump yielded a pale yellow fluid. Microscopic examination of the Hematoxylin and Eosin–stained smears revealed an unexpected finding—numerous elongated, slender, and coiled organisms with smooth contours. They exhibited a rounded anterior end and a pointed posterior end, with a continuous nuclear sheath that stopped short of the tail tip, leaving a distinctive clear zone. These morphological features confirmed the presence of *Wuchereria bancrofti* microfilariae. The background showed a mixed inflammatory infiltrate, mainly composed of lymphocytes and a few polymorphonuclear leukocytes, embedded in an eosinophilic proteinaceous matrix.

A definitive diagnosis of breast filariasis was made based on the cytological findings.(Figure 1A 1A). The patient subsequently underwent surgical removal of the breast mass. Grossly, the specimen consisted of a gray-white to gray-brown soft tissue mass with a central gray-black area, measuring 1.0 × 0.8 cm. (Figure 2) The cut surface revealed a hemorrhagic center.

Histopathological analysis of the excised tissue confirmed a benign cystic lesion. The cystic areas lacked epithelial lining and showed chronic inflammatory cell infiltration. The surrounding breast tissue retained normal lobular architecture, with ductal and acinar structures appearing unremarkable. The acini displayed a typical bilayered epithelium—an inner cuboidal and outer myoepithelial layer. Multiple congested blood vessels and focal area showing filarial parasite within the breast tissue along with chronic inflammatory infiltrate was seen in the stroma (Figure 3A)

In summary, this case highlights a rare yet significant diagnosis of breast filariasis in an endemic region. The detection of *Wuchereria bancrofti* microfilariae through FNAC was pivotal, helping to avoid misdiagnosis as a neoplastic lesion and underscoring the need to consider parasitic infections in the differential diagnosis of breast lumps, particularly in tropical areas where such diseases are still prevalent.

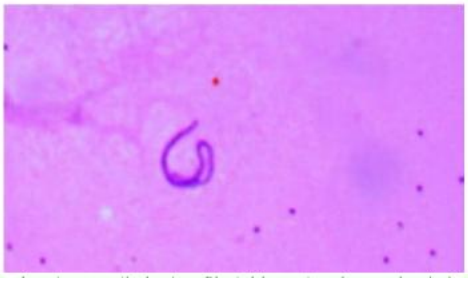

Figure 1A. FNAC smear showing a coiled microfilarial larva in a hemorrhagic background.(H & E x 100)

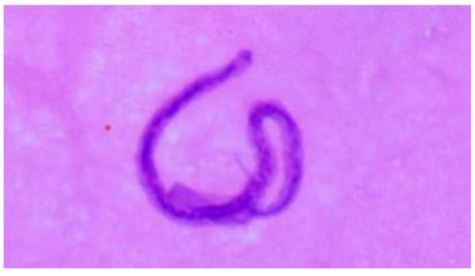

Figure 1B. Higher magnification showing the characteristic morphology of the coiled microfilarial larva.(H & E x400)

Figure 2. Gross specimen of the excised right breast lump measuring **1 × 0.8 cm** with a central hemorrhagic area.

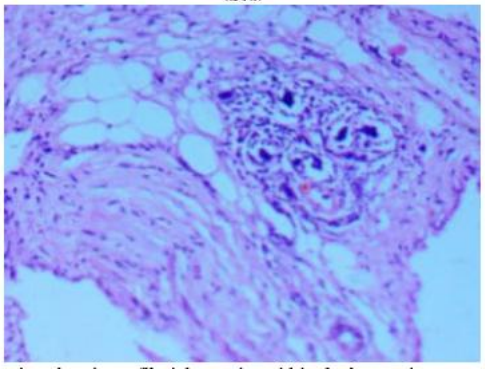

Figure 3A. H&E section showing a filarial parasite within the breast tissue associated with chronic inflammatory infiltrate (×400).

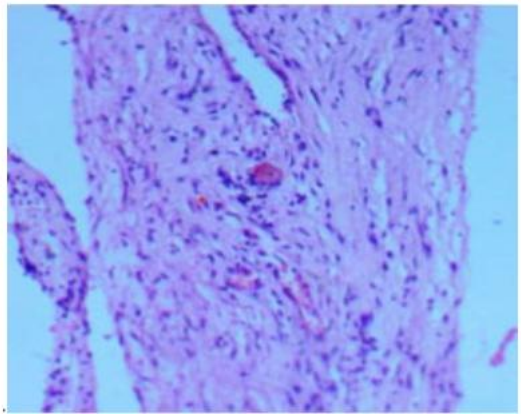

Figure 3B. H&E-stained section showing a fibrocollagenous cyst wall with chronic inflammatory infiltrate (**×100**).

DISCUSSION

Lymphatic filariasis, a mosquito-borne parasitic disease primarily caused by *Wuchereria bancrofti*, continues to pose a significant public health challenge in tropical regions, including India. While the infection is common in endemic areas, involvement of the breast by filarial parasites is exceedingly rare. Typically, lymphatic filariasis presents as lymphangitis, elephantiasis, or hydrocele, and is often asymptomatic. Detection of microfilariae in fine needle aspiration cytology (FNAC) smears from atypical sites such as the breast is usually incidental, but diagnostically critical, particularly because such lesions can mimic malignancy.

In the present case, a 38-year-old woman presented with a solitary, clinically benign-appearing breast lump in the upper outer quadrant. Ultrasonographic evaluation suggested a cystic lesion. Notably, the patient lacked classical signs of filariasis, such as fever, lymphadenopathy, eosinophilia, or peripheral microfilaremia, making the diagnosis particularly challenging. The incidental identification of *Wuchereria bancrofti* microfilariae in the FNAC smear proved essential in guiding accurate diagnosis and management. This finding aligns with previous

reports emphasizing similar serendipitous detections.

For instance, Khan et al. described a "filarial breast mouse" case in which FNAC played a pivotal role in identifying microfilariae and ruling out carcinoma [3]. Dayal and Seivaraju reported a breast nodule resulting from chronic lymphatic inflammation due to filariasis, where histopathology confirmed fibrosis with parasitic infiltration [4]. While our case mirrored these clinical and diagnostic features, it notably differed in the absence of peripheral eosinophilia.

Gunja et al. also documented the incidental detection of microfilariae in FNAC of a benign-appearing breast lesion, reinforcing the importance of cytological awareness [5]. Similarly, Barwad et al. highlighted a case where FNAC spared the patient from unnecessary surgical intervention by confirming a parasitic etiology [6]. Sangwan and Singh observed that the upper outer quadrant was the most commonly affected site in breast filariasis—corroborated by our case findings [7].

Filarial infections have also been reported at other atypical sites. Choudhury et al. and Kundu et al. described incidental microfilarial findings in thyroid FNAC specimens collected for goitrous swellings [2,8], while Rawat et al. and Varghese et al. reported similar parasitic detections in lymph nodes initially suspected to be tubercular or reactive [9,10]. In many of these cases, patients lacked systemic features, highlighting the parasite's ability to remain clinically silent while infiltrating local tissues.

From a global perspective, the World Health Organization estimates that over 120 million people are infected with lymphatic filariasis, with around 370 million at risk in India alone [1]. Despite its high prevalence, the detection of microfilariae in cytological samples remains uncommon due to the parasites' nocturnal periodicity and the often asymptomatic nature of the infection.

This case reinforces the vital diagnostic role of FNAC, particularly in endemic areas. Identifying microfilariae in breast lesions not only prevents misdiagnosis of neoplasia but also ensures timely and appropriate clinical intervention. As a frontline diagnostic tool, FNAC is cost-effective, minimally invasive, and invaluable—especially when interpreted with an understanding of local disease epidemiology.

CONCLUSION

Breast filariasis is an exceedingly rare manifestation of lymphatic filariasis, often presenting as a benign-appearing lump and mimicking common breast pathologies such as fibroadenoma or cysts. The incidental detection of *Wuchereria bancrofti* microfilariae on fine needle aspiration cytology (FNAC) highlights the importance of maintaining a high index of suspicion in patients from endemic regions, even in the absence of systemic signs or peripheral eosinophilia. This case reinforces the critical role of FNAC as a simple, cost-effective, and reliable diagnostic tool for identifying parasitic infections at uncommon sites, thereby guiding appropriate clinical management and avoiding unnecessary interventions. Routine cytological vigilance can lead to timely diagnosis and targeted therapy, especially in endemic zones where filariasis continues to pose a significant public health burden.

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