Case Series

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Microfilaria in Fine Needle Aspiration Cytology of Breast Lump: An Unusual Incidental Finding

Punam Prasaad Bhadani*, Shuchismita, Ruchi Gupta***, Ranwir Kumar Sinha****, Iffat Jamal******

*Additional Professional and Incharge **Senior Resident ****Tutor, Department of Pathology ***Senior Resident, Department of Radiodiagnosis, All India Institute of Medical Sciences, Patna.

Abstract

Introduction: Filariasis is a major health problem in tropical countries including India. Fine needle aspiration cytology plays an important role in prompt recognition of disease. Extranodalfilariasis is a rare entity, and the breast is also one of the sites for filariasis. Patients commonly present with an underlying lump that may occasionally mimic malignancy. The disease mainly involves the lymphatic system of the body. The most frequently involved lymphatics are those of the lower limbs, retroperitoneal tissues, glands, spermatic cord, and epididymis. Lymphatic filariasis is mostly caused by Wuchereriabancrofti and Brugiamalayi. However, filarial breast nodule is a very rare finding even in an endemic region. Here, we present 4 cases of filarial breast lump diagnosed by fine needle aspiration cytology. *Case Series:* The present cases included incidentally detected four cases of microfilaria in breast aspirates along with the associated underlying breast pathology. *Conclusion:* Filarial breast nodule is rare, and it often mimics a neoplastic breast lesion. FNAC is a very effective diagnostic tool in the diagnosis of filarial breast lesion and it helps avoid unnecessary surgical procedure. It should be considered as a differential diagnosis for short-lasting nodular breast lump, especially in countries like India, where filariasis is an endemic disease.

Keywords: Microfilaria; Cytology; Breast Lump.

Introduction

Filariasis is a common health problem in India and South East Asia. Heavily infected states in India are Uttar Pradesh, Bihar, Jharkhand, Andhra Pradesh, Orissa, Tamil Nadu, Kerala and Gujrat [1]. 600 million people are at risk of lymphatic filariasis in 20 endemic states in India.[1] Coastal regions and river banks are more prevalent areas.

About 95% of cases of lymphatic filariasis are caused by infestation of W. bancrofti in world followed by B. malayi and B. timori [1]. In India, most of the disease is caused by two nematodes W. bancrofti and B. malayi [1]. It is transmitted by the bite of culex mosquitoes [1]. Man serves as definitive host. Adult worms are found in the lymphatic vessels and lymph nodes of man only. The embryos (microflariae) circulate in the peripheral blood and are sucked up by their appropriate intermediate host (mosquito).

The parasite most frequently involves the lymphatics of lower limbs, retroperitoneum, glands, spermatic cords and epididymis [1]. Unusual sites reported in various literature are thyroid nodules, salivary glands, bronchial aspirates, pericardial fluid, cervicovaginal smears, ovarian cyst fluid, joint aspirates and breast [2]. Despite its high incidence in endemic region, it is very unusual to find microfilaria at these rare sites. It is quite unusual to find adult worm in breast aspirates and paucity of reports in literature has made this study as worth reporting [3,4,5]. Incidental diagnosis of filariasis in association with breast carcinoma is extremely rare and only few cases are available in literature [6].

Definitive diagnosis of lymphatic filariasis depends upon the demonstration of living parasites in the

Corresponding Author: Punam Pd. Bhadani, Additional Parofessor and Incharge, Department of Pathology, All India Institute of Medical Sciences,(AIIMS), Patna - 801505 Bihar.
E-mail: Bhadanipunam@gmail.com

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human body by night blood survey [7]. Fine Needle Aspiration Cytology (FNAC) is the best diagnostic tool for evaluation of palpable breast lump. Lymphatic filariasis and its severe manifestations are prevented by making an early diagnosis with the aid of cytology and early treatment can be instituted.

Case Reports

Case 1

A 35 year old female presented with a painless breast lump in the right breast since one year. The patient had no history of fever, anorexia, weight loss or nipple discharge. General physical examination was unremarkable. On systemic examination, there was a single well defined, mobile, non tender cystic lump of size 2 x 1.5 cm in upper outer quadrant of right breast. Ultrasonography revealed a cyst at 11 O' clock position having thin moving septations with posterior acoustic enhancement (Figure 1). FNAC was done to evaluate the nature of the lesion. Aspiration was done by a 23 G needle attached with a 10 ml syringe and yielded 1 ml straw coloured fluid. The smears made were air-dried and stained with May–Grünwald Giemsa stain (MGG), smears were also fixed in 95% ethanol and stained with Papanicolaou stain. Smears revealed many sheathed adult microfilaria singly and in clusters along with few clusters of benign ductal epithelial cells (Figure 1). Midnight peripheral blood sample didnot show presence of microfilaria with absence of peripheral eosinophilia. She was treated with diethylcarbamazine (DEC) for 3 weeks and patient is in follow up period.

Case 2

A 60 year old female presented with a progressively enlarged right breast lump since 9 months. The patient had no history of fever, anorexia, weight loss or nipple discharge. Local examination revealed a single, well defined, firm, painless lump of size 1.5 x 1cm in upper outer quadrant. As the size of lump was small, aspiration was done under ultrasound guidance by a 23 G needle attached with a 10 ml syringe yielded blood mixed aspirate. The smears made were air-dried and stained with May-Grünwald Giemsa (MGG), smears were also fixed in 95% ethanol and stained with Papanicolaou stain. Smears revealed adult filarial worm with surrounding fair number of histiocytes along with mature and transforming lymphocytes (Figure 2). Peripheral blood examination showed eosinophilia without microfilaraemia. With strong clinical suspicion of neoplasm, lump was surgically excised and sent for HPE. Section showed embedded adult filarial worm in periductuloalveolar areas with surrounding eosinophils and formation of lymphoid follicles (Figure 2).

Case 3

A 45 year old female patient presented with lump in right breast and nipple discharge since 6 months. Local breast examination reveal, a single well defined, firm to hard, painless lump of size 4 x4 cm in upper inner quadrant. Ipsilateral axillary lymph nodes were also enlarged. Mammogram showed a heteroechoic lesion in the right breast in upper inner quadrant and reported as Breast Imaging – Reporting and Data System (BIRADS)- Grade 5 . Aspiration was done by a 23 G needle attached with a 10 ml syringe and yielded blood mixed aspirate. The smears made were air-dried and stained with May-GrünwaldGiemsa (MGG), smears were also fixed in 95% ethanol and stained with Papanicolaou stain. Cytomorphological diagnosis of infiltrating ductal carcinoma was made. Patient underwent for modified radical mastectomy and sent for histopathological examination. Nipple areola complex section showed sheathed adult microfilaria of W.bancrofti with associated infiltrating ductal carcinoma (Figure 3).

Case 4

A 30 year old female presented with a painless breast lump in the right breast since 3 months. Breast examination revealed, a single well defined, mobile, non tender, soft to firm lump of size 2 x 2 cm in upper outer quadrant. Ultrasonography suggested a circumscribed, homogenous, oval hypoechoic mass having thin echogenic capsule.

Aspiration was done by a 23 G needle attached with a 10 ml syringe and yielded blood mixed aspirate. The smears made were air-dried and stained with May-GrünwaldGiemsa (MGG), smears were also fixed in 95% ethanol and stained with Papanicolaou stain. Smears revealed sheathed microfilaria of W. bancrofti species the tail of which was free from nuclei and had graceful curves along with few clusters of benign ductal epithelial cells. Midnight peripheral blood sample didnot show presence of micrfilaria and absence of eosinophilia. She was treated with diethylcarbamazine (DEC) for 3 weeks and discharged in satisfactory condition.

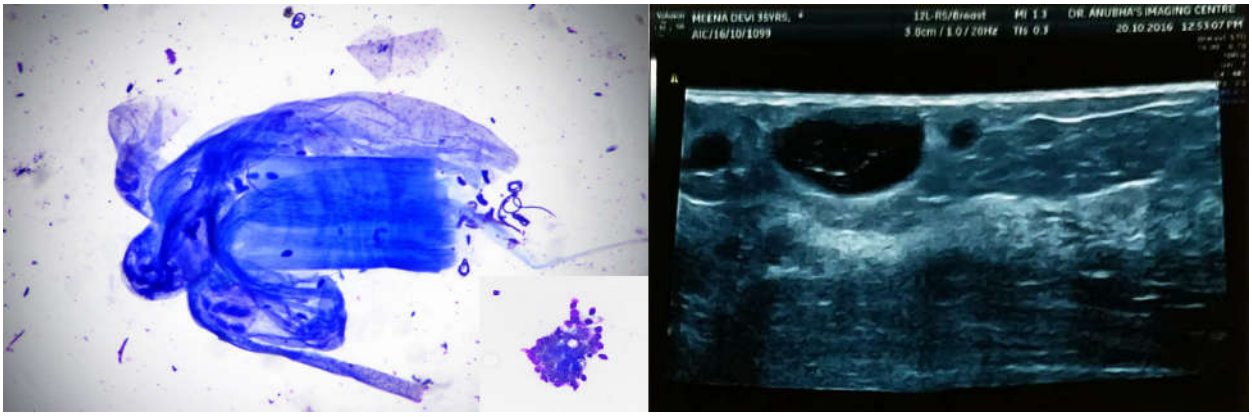

Fig. 1: Photomicrograph showing numerous clusters of sheathed adult microfilarialworms (MGG X 40). Inset shows ductal epithelial and myoepithelial cells (MGG, X 400). Ultrasonography revealed a cyst at 11 o' clock position with thin moving septations and posterior acoustic enhancement

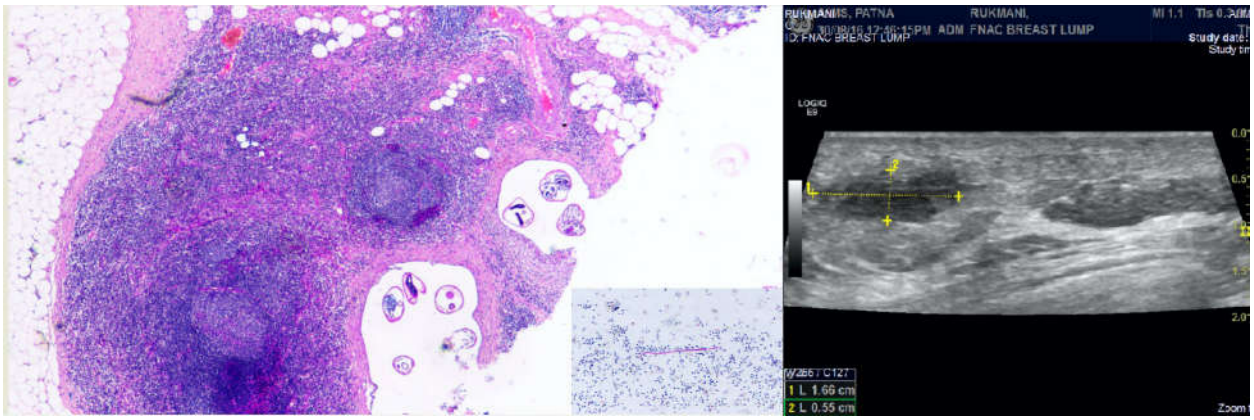

Fig. 2: Photomicrograph showing embedded adult filarial worm in periductuloalveolar areas with reactive lymphoid formation (H&E X 100). Inset shows adult filarial worm with surrounding fair number of histiocytes and mature and transforming lymphocytes (MGG, X 400). Ultrasonography revealed a hypoechoic lesion of size 1.66 x 0.55 cm

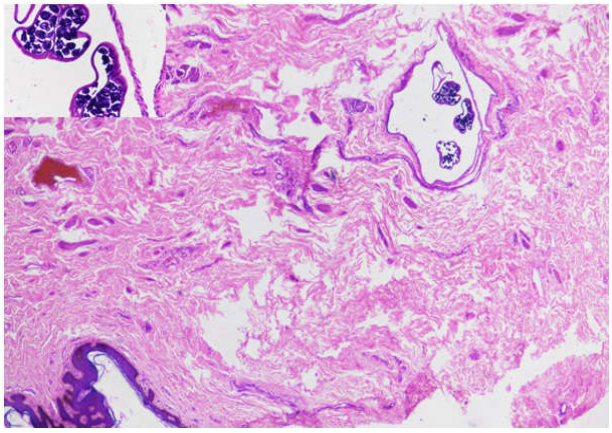

Fig. 3: Photomicrograph showing adult microfilarial worm in section from nipple areola complex (H&E, X20). Inset shows the same in higher magnification (H&E, X400)

Discussion

Filariasis is a major health problem of tropical countries like India. At least eight species of filarial parasites that causes human infection are W. bancrofti, B. malayi, B. timori, O. volvulus, L. loa, T. perstans, T. streptocerca and M. ozzardi [8]. Among them lymphatic filariasis is caused by only three species i.e. W. bancrofti, B. malayi and B. timori [1]. About 95% of cases of lymphatic filariasis are caused by infection with W. bancrofti [1].

In India, vector of bancroftian and brugianfilariasis is female Culex *pipiens* fatigans mosquito [1]. The parasite completes its life cycle in two hosts. Man is definitive host where sexual cycle takes place. Mosquito harbors the larval stage of parasite. Adult worms resides in the lymphatic channels and lymph nodes of man. Female worms are much longer than males. Female worms are viviparous giving birth to approximately 50,000 microfilariae per day [8]. Microfilaria completes its development in the insect host, giving rise to the infective form i.e. third stage larva. Infection is transmitted to definitive host by the bite of mosquito.

Bancroftian filariasis causes a wide range of clinical manifestations. In acute phase, presentation may be varied ranging from fever, lymphangitis,

lymphadenitis, epididymo–orchitis and funniculitis. Chronic stage is characterized by lymphoedema, lymphadenopathy, hydrocele and elephantiasis. Majority of infected individuals are asymptomatic [9]. In all our four cases, none of them showed microfilaria in peripheral blood smear examination prepared at night which corroborates with the observation that in endemic areas, filariasis can manifests without microfilaremia or microfilaremia may be extremely transient [2].

The most commonly affected lymphatics are those of lower limbs, spermatic cord, epididymis and retroperitonal tissue [1]. Breast filariasis is quiet unusual and commonly presents with a unilateral, painless, solitary palpable lump in the upper outer quadrant of breast [10]. Sometimes it is mistaken for malignancy. Some other parasites which may also presents as breast lump are cysticercosis, schistosomiasis and dirofilarisis [11]. The occurence of microfilaria have been observed as coexistent findings with various benign and malignant tumours such as liver haemangiomas, meningiomas, intracranial haemangioblastomas, fibromyxomas, squamous cell and undifferentiated carcinomas of cervix, pharyngeal carcinomas, lymphangiosarcomas, urinary bladder carcinomas, prepucial carcinomas, metastatic carcinomas, melanomas, and homological malignancies such as leukemias [12].

Various authors have suggested and explained that microfilaria circulate in vascular and lymphatic channels and whenever they appear in tissue fluid and exfoliate into the surface material, would possibly signify the conditions of lymphatic and vascular obstruction which causes extravasation and release of microfilaria into the blood circulation [12]. Ahluwalia et al stated that larva may be presentin the vasculature and aspiration may leads to the rupture of vessel and release of microfilaria into the aspirate [13]. In another study Gupta et al reported six cases where microfilaria were found in body fluid cytology and FNAC smears in association with various benign and malignant conditions [14]. In another significant study Walter et al suggested that microfilaria appears in tissue fluids and exfoliated surface material due to lymphatic and vascular obstruction and subsequent extravasation [15].

Diagnosis of filarial lesions depends upon the demonstration of microfilaria in the peripheral blood smears prepared from mid–night sample and detection of filarial antigen and antibody. Imaging modalities such as ultrasonography (USG) serves as a valuable diagnostic tool in cases of lymphatic filariasis. A specific movement of worms called as filarial dance has been described by USG [16]. After a period of time these worms calcify and then mammographic findings are indistinguishable from intraductal carcinoma of breast [17].

The role of FNA cytology in the diagnosis of filariasis is well established and cost effective. Cytology reveals adult filarial worm having hyaline sheath, cephalic space and presence of somatic cells (nuclei) which appears as granules that extends from the head to the tail. Tail tip is free of nuclei in adult filarial worm ofW. bancrofti. Benign ductal epithelial cells along with mixed inflammatory infiltrate (polymorphs, lymphocytes, eosinophils and histiocytes) is also seen. The presence of epithelioid cell granulomas and giant cells is also a coincidental finding.

In a study by Shaila et al, eight cases of breast filariasis were reported out of twenty four cases.[18] Erythema was noticed in two out of eight cases.Chayanika et al reported only one case of microfilaria in right breast lump out of seven cases at unusual sites [19]. Thestudy done by Varghese et al reported only one case of microfilaria in cystic breast lesion out of six cases of microfilaria in cytological smears [2].

DEC is the drug of choice as it is effective against the adult worms and microfilaria. A single dose of 6mg / kg body weight is effective. The other drug used is Ivermectin in a single dose of 200 to 400 microgram per kg body weight.

Conclusion

These case reports highlights the importance of screening of FNAC smears for parasites in endemic regions even in the absence of clinical manifestations. As these asymptomatic cases may harbor microfilaria, detection of carrier is a major challenge in the way of disease eradication. FNAC is a very effective diagnostic tool in the diagnosis of filarial breast lesion, It should be considered as a differential diagnosis for short-lasting nodular breast lump to avoid unnecessary surgical procedure.

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