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Clinico-pathological spectrum of filariasis in fine needle aspiration cytology: 7 years retrospective study in a tertiary care hospital of North India

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Abstract

Background: Filarial infestation is common in developing countries like India. It is transmitted by bite of culex mosquito. They usually present with superficial nodular swelling and lymph node enlargement with variety of clinical symptoms, however the index of suspicion is always low. Fine needle aspiration cytology (FNAC) is a very cost effective tool for rapid diagnosis of the disease.

It is a retrospective analysis of filarial cases diagnosed on FNAC in the last 7 years to study the clinico-pathological spectrum.

Material and Methods: The records of the department of cytology KGMU were searched from Jan 2010 to Dec 2016 and all the cases of filariasis involving different tissues and body fluids were analysed in detail for cytomorphological and clinical features.

Results: A total of 32 cases of filariasis were evaluated. Most common age group affected was 30-40 years (range: 12-70 years). Out of 32 cases, 11 cases presented as nodular superficial swellings, 9 cases as lymphadenopathy, 5 cases were found in thyroid, 2 cases in breast, 2 cases in salivary gland and each case in testis, lung and ascitic fluid. Majority of cases (62.5%) showed chronic inflammation, 7 cases (21.8%) were associated with malignancies including metastatic as well as primary of various tissues. Microfilariae were also detected with benign phylloides tumor of breast in one case (3.1%) and with colloid goitre thyroid in 4 cases (15.6%).

Conclusion: Nodular superficial swelling is the most common presentation; however filarial worms can invade many more organs of the body. It can present solely as granulomatous inflammation or remain asymptomatic and found as an incidental finding. Conventional mode of diagnosis is demonstration of microfilaria in peripheral blood smear and body fluids. Co-existence of microfilaria with neoplastic lesions is rare. Fine needle aspiration cytology plays a vital role in the diagnosis of these lesions.

Keywords: Microfilaria, FNAC, neoplastic lesions

Manuscript

Introduction:

Filariasis is endemic in tropical countries like India, China, Indonesia and part of Africa [1, 2]. India contributes ~40% of the global burden and accounts for 50% of the people at risk of infection [3]. In India, disease is especially endemic in Uttar Pradesh, Bihar, Jharkhand, Andhra Pradesh, Orissa, Tamil Nadu, Kerala & Gujarat. These 9 states contributes to 95% of the total burden [2, 3]. Filarial worm dwell in the skin and subcutaneous tissue (*Onchocera volvulus* and *Loa loa*) or the lymphatic system (*Wuchereria bancrofti* and *Brugia malayi*) [1-3]. Filariasis is caused by slender thread like filarial worms which belongs to the superfamily of filarioidea. Most common filarial worms are *Wuchereria bancrofti*, *Brugia malayi*, *Brugia timori* in descending order [3, 4]. In India, most common cause of filariasis is *Wuchereria bancrofti* [1-4]. Filariasis is a vector born disease transmitted by female culex mosquitoes [4]. *Wuchereria bancrofti* filariasis produce a wide range of clinical manifestation according to phase which can be acute or chronic. The acute phase is usually associated with eosinophilia and microfilaremia. The chronic phase presents as lymphadenopathy, lymphedema, hydrocele and elephantiasis [1]. Fine Needle Aspiration Cytology (FNAC) is very cost effective tool for rapid diagnosis of subclinical filarial disease [1-5].

Materials and Methods

This retrospective study was conducted in the department of Pathology, KGMU, Lucknow which is largest tertiary care centre of Uttar Pradesh. The study was done on FNAC carried out on various sites including superficial nodular swelling, lymph node, thyroid, breast, salivary gland, lung mass, ascitic fluid, testis. The study was conducted retrospectively during a period of 7 years i.e. Jan 2010 to Dec 2016. During this period total of 32 cases incidentally diagnosed as filariasis on FNAC with or without any associated pathology, were retrieved. FNAC were done using 20 ml syringe and 23 gauge needle under aseptical precautions. Aspirated materials were spread on slides. These smears were wet fixed immediately in 95% alcohol and stained by hematoxylin & eosin and Papanicolaou stain. Air dried smears were stained by Giemsa stain. Finally total 32 cases have retrieved which was incidentally diagnosed as filariasis with associated other pathology by microscopic examination of FNAC smears without clinical suspicion of filariasis disease.

Smears prepared from various sites aspirates revealed sheathed microfilariae with a central column of nuclei along with cephalic and tail ends were free from nuclei (somatic cells). In our study most of cases have detected microfilariae and only few cases have eggs. The number of microfilariae varied from single to numerous in per slide. One case from arm swelling aspirates shows even 10 microfilariae in per low power field microscope.

Results

Out of 32 cases, there were 21 cases between 26-50 age group, 6 cases between 51-75 age group and 5 cases between 10-25 age group. The Diseases was equally prevalent in males and females. The records revealed that in none of the cases clinical diagnosis of filariasis was suspected by the clinicians. All the 32 patients presented in O.P.D. as history of palpable swelling. 6 out of 32 patients presented with fever and only 2 had history of Pain. PBS show eosinophilia in only 10 cases. Out of these 10 cases, 8 cases had superficial nodular swelling and 2 cases had lymph node enlargement. Microfilaremia was detected in only 4 cases in which 3 cases from superficial nodular swelling and one case from lymph node enlargement. Out of 32 cases, 11 cases from superficial nodular swelling which includes- swelling from arm, forearm, back, cubital fossa, orbital fossa, iliac fossa, chest wall and axillary area. 9 cases from lymph node enlargement, 5 cases from thyroid swelling, 2 cases from breast swelling, 2 cases from salivary gland swelling, 1 case from lung mass, 1 case from testicular swelling, 1 case from ascitic fluid. On FNAC, blood mixed material aspirated in 20 cases, clear fluid in 7 cases, colloid like material in 3 cases, pus like material in 2 cases. On microscopic examination of FNAC from various sites swelling in which maximum cases diagnosed as only Filariasis (24 cases). Only one case of microfilariae associated with benign lesion like phylloids tumor. 7 cases of microfilariae associated with malignant lesion includes metastatic adenocarcinoma in cervical & supraclavicular lymph node, Non Hodgkins lymphoma, Follicular neoplasm of thyroid, Infiltrating ductal carcinoma of breast.

Table 1: Demographic, Clinical, haematological, cytological finding

Features	Superficial Nodular swelling (n=11)	L.N. (n=9)	Thyroid (n=5)	Breast (n=2)	Salivary Gland (n=2)	Lung Mass (n=1)	Ascitic Fluid (n=1)	Testis (n=1)	Total (n=32)
Age									
10 – 25	3	1	1	0	0	0	0	0	5
26 – 50	7	5	3	2	1	1	1	1	21
51 – 75	1	3	1	0	1	0	0	0	6
Sex									
Male	5	5	1	0	1	1	1	1	15
Female	6	4	4	2	1	0	0	0	17
C/F									
Swelling	11	9	5	2	2	1	1	1	32
Fever	2	3	0	0	1	0	0	0	6
Pain	0	0	0	0	0	1	1	0	2
PBS finding									
Eosinophilia	8	2	0	0	0	0	0	0	10
Microfilaremia	3	1	0	0	0	0	0	0	4
Nature of aspirate									
Clear fluid	5	1	0	0	0	0	1	0	7
Hemorrhagic	4	8	2	2	2	1	0	1	20
Pus like	2	0	0	0	0	0	0	0	2
Colloid	0	0	3	0	0	0	0	0	3

Table 2: Cytological smears from various anatomical sites shows filariasis associated with various pathology

Anatomical site	Inflammatory swelling	Benign lesion	Malignant lesion	Total cases
Superficial nodular swelling				
Arm swelling	4 (Non-specific)	0	0	4
Forearm swelling	1 (Non-specific)	0	0	1
Back swelling	1 (Non-specific)	0	0	1
Cubital fossa	1 (Non-specific)	0	0	1
Orbital fossa	1 (Non-specific)	0	0	1
Iliac fossa	1 (Non-specific)	0	0	1
Chest wall	1 (Granuloma)	0	0	1
Axillary area	1 (Non-specific)	0	0	1
Lymph node				
Cervical	1(Granuloma)	0	2 (Metastatic, NHL)	3
Supraclavicular	1(Granuloma)	0	2(Metastatic)	3
Axillary	1(Granuloma)	0	0	1
Inguinal	1(Granuloma)	0	0	1
Submental	0	0	1 (Metastatic)	1
Thyroid	4 (colloid goiter)	0	1(Follicular neoplasm)	5
Breast	0	1 (Benign phylloid)	1 (IDC)	2
Salivary gland	2 (Non-specific, Granuloma)	0	0	2
Lung mass	1 (Non-specific)	0	0	1
Ascitic fluid	1 (Non-specific)	0	0	1
Testis	1 (Non-specific)	0	0	1
Total cases	24	1	7	32

Discussion

Filariasis is major public health problem in tropical countries, including India. It is caused by sheathed and unsheathed microfilariae includes *Wuchereria bancrofti*, *Brugia malayi*, *Loa loa* and *Mansonella*, *Onchocerca* respectively. *Wuchereria bancrofti* and *Brugia malayi* are the most common species causing filariasis in India. The parasite is primarily confined to lymphatic system and lymph node of definitive host. It can also involved any part of the body [1]. Despite high incidence, it is infrequent to find microfilariae in FNAC smears & body fluid due to nocturnal periodicity of filarial worms [2].

In our 7yr retrospective study most common age presentation was 26-50 yrs. These findings were consistent with finding of Pal *et al.* In our study all patient presents with swelling without clinical suspicion of filariasis (100%). Our finding were consistent with the finding of of Khare *et al.* (100%) [1]. In our study from various anatomical sites involved by filariasis in decreasing order like soft tissue swelling, lymph node, thyroid, breast, salivary gland, lung mass, testis, ascitic fluid. A review of literature reveals incidental detection of microfilariae in cytological smears made from different anatomical sites aspirate includes soft tissue swelling, breast, lymph node, thyroid gland, salivary gland, lung aspirate, bone marrow, brain along with various body fluids like pleural, ascitic, pericardial and urine samples [2].

In our study maximum cases (11 out of 32 cases) were reported from superficial nodular swelling, this finding is consistent with Yenkeswar *et al.* While some other authors found Lymph node as commonst site in there study [1, 2, 4], (Table-3). These superficial nodular swelling demonstrated microfilariae associated with non-specific inflammation and granulomatous inflammation. Similar observations were also reported in literature by some other authors [1, 2, 4, 5, 6, 7, 8]. During retrospective analysis we observed nine cases from different sites of lymph node (Cervical, Supraclavicular, Axillary, Inguinal, Submental) aspirates demonstrated microfilariae associated with inflammatory and malignant lesions. Three cases from cervical lymph node demonstrated

microfilarae along with each Granulomatous inflammation, Metastatic adenocarcinoma, Non hodgkins lymphoma. Three cases from supraclavicular lymph node demonstrated microfilarae along with each Granulomatous inflammation, Metastatic epithelial malignancy, Metastatic adenocarcinoma. Each case from axillary and inguinal lymph node demonstrated microfilariae with Granulomatous inflammation. One case from submental lymph node showed microfilariae with Metastatic epithelial malignancy. Similar observation was also reported by other authors [2, 3, 6, 9, 10, 11].

Thyroid gland is very rare site for filariasis, this finding is consistent with Pal *et al.* and Chowdhary *et al.* In our study four cases demonstrated microfilariae with colloid goiter and one case showed microfilariae with follicular neoplasm of thyroid. Similar finding was also observed by other authors [2-6, 12-15].

In our study breast is uncommon site for filariasis but according to Mitra *et al.* breast is common site for filariasis. Our study two cases of breast aspirates in which one case demonstrated microfilariae with benign phylloid tumor of breast and another demonstrated microfilariae with Infiltrating ductal carcinoma of breast. Similar observations were also reported by other authors [2, 3, 6, 16].

Two cases of salivary gland (submandibular gland) in which one case demonstrated microfilariae with background of mixed inflammatory cells and another case demonstrated microfilariae with granulomatous sialadenitis. Similar finding was also reported by Pal *et al.* and Kurup *et al.*

One case of USG guided aspirate smears from lung mass showed microfilariae with background of mixed inflammatory cells and mesothelial cells even this case was clinically suspected as malignant lesion. Lung is also rare site reported by Gupta *et al.* [18].

One case of testicular swelling demonstrated microfilariae with background of inflammatory cells. Similar observation was also reported by other authors [1, 2, 4, 6].

One case of ascitic fluid showed microfilariae with metastatic adenocarcinoma. Similar finding was also observed by Andola *et al.*

Table 3: Comparison of filarial infections among several studies

S.N.	Study/ Year	No. of cases	Superficial nodular swelling	Lymph node	Thyroid	Breast	Salivary gland	Lung mass	Testiculo-scrotal region	Effusion fluid	Others
1.	Mitra <i>et al.</i> (2009)	n = 24	6 (25%)	2 (8%)	3	8	--	--	--	1	4
2.	Andola <i>et al.</i> (2011)	n = 25	5 (20%)	7 (28%)	1	3	--	--	2	4	3
3.	Khare <i>et al.</i> (2014)	n = 20	3 (15%)	6 (30%)	3 (15%)	2 (10%)	--	--	6 (30%)	--	-
4.	Pal <i>et al.</i> (2018)	n = 22	4	5 (23%)	2	3	--	--	4	2	-
5.	Our study	n = 32	11 (34%)	9 (28%)	5 (15%)	2 (6%)	2 (6%)	1 (3%)	1	1	-

Conclusion

Diagnosis of filariasis should be considered as differential diagnosis of superficial nodular swelling, lymph node enlargement, inguinoscrotal region swelling and other rare sites especially in endemic region. Pathologist should have high index of suspicion during screening of FNA from palpable swellings. So early detection of unsuspected & asymptomatic patients and treated as soon as possible. Our study highlights the importance of screening smears for parasites (*W. Bancrofti*) even in the absence of clinical manifestation of filariasis. So that concomitant treatment of microfilariae can be given along with the associated pathology.

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