

Incidental Diagnosis of Filariasis in Superficial Location by FNAC: A Retrospective Study of 10 Years

PRATIMA KHARE¹, POOJA KALA², ADITI JHA³, NIDHI CHAUHAN⁴, PRIYANKA CHAND⁵

ABSTRACT

Background: Filariasis, transmitted by the bite of various species of mosquito, is a common disease of tropical belt of the world. In South East Asia, including India, it is a major public health problem. The parasite is primarily confined to Lymphatic channel or lymph nodes where it can remain viable for more than two decades. The most common presentation of the disease is asymptomatic/ subclinical microfilaremia, Hydrocele, acute adeno-lymphangitis (ADL) and chronic lymphatic disease. However, the disease may rarely present as superficial swellings at unusual sites. Incidental findings of microfilaria on fine needle aspiration cytology in these situations, helps in prompt recognition of the disease.

Aim: The aim of this retrospective study was to assess the incidental diagnosis of Filariasis on fine needle aspiration cytology (FNAC), done for swellings in superficial locations over last ten years at our institute.

Materials and Methods: This retrospective study was conducted over a period of 10 years from April 2003 to March

2013 on the cases where FNAC was carried out on swellings in superficial locations of the body. Twenty cases of filariasis were diagnosed on routine FNAC material obtained from various superficial sites. Their data was retrieved and analyzed.

Results: Among the 20 cases diagnosed as filariasis on FNAC, six cases involved lymph nodes, six involved testiculo-scrotal region, three cases of thyroid swelling, soft tissue swelling in three cases and breast lump in two cases. On FNA smears, microfilariae were seen in all 20 cases, eggs in three cases, adult female worm in two cases and adult male worm in one case. Adherence of inflammatory cells and macrophages to microfilariae was noticed in 4 cases. Eosinophilia was present in seven cases. Microfilaremia was present in only three cases. Causative agent was *Wuchereria bancrofti* in all cases.

Conclusion: Although not so common, filariasis should be considered as one of the differential diagnosis of a superficial swelling particularly if clear fluid is obtained on FNAC. Careful screening of smears plays a significant role in recognition of the disease even in asymptomatic patients.

Keywords: Filariasis, Fine needle aspiration cytology (FNAC), Microfilaria

INTRODUCTION

Filariasis, transmitted by the bite of various species of mosquito, is a global health problem of tropical belt of the world. It is a major health problem in South East Asia, including India [1]. It affects over 120 million people in 80 countries. The disease is endemic all over India except some parts of Northern India (Delhi, Rajasthan, Haryana, Punjab and Himachal Pradesh) and Northeast India (Nagaland, Manipur, Tripura, Sikkim & Arunachal Pradesh) [2]. In India, there are at least 600 million people at risk of lymphatic filarial infection and at least 735 thousand have lymphoedema and another 336 thousand have hydrocele [3]. The parasite is primarily confined to Lymphatic channel or lymph nodes where it can remain viable for more than two decades. The most common presentation of the disease is asymptomatic/ subclinical microfilaremia, Hydrocele, acute adeno-lymphangitis (ADL) and chronic lymphatic disease [1]. Demonstration of microfilaria in peripheral blood smear is used for diagnosis of filariasis. It is rare to find microfilariae in fine needle aspiration cytology (FNAC) smears even in endemic areas. The aim of present study was to assess the role of FNAC in diagnosis of filariasis in asymptomatic patients having palpable swellings.

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Pathology, Dr. B.S. Ambedkar Hospital, Delhi, which caters primarily to the sub-urban population of North Delhi, India. A large number of migrant populations from nearby states of Delhi reside in the area. The study was done on FNAC carried out on superficial swellings in the department over last ten years from April, 2003 to March 2013. The records of all those cases finally diagnosed as filariasis on FNAC, with or without any associated pathology, were retrieved.

During this period, a total of about 25,468 FNACs were carried out on superficial swellings/ clinically palpable swellings from various sites. There were 12,684 cases of lymph node swellings, 4,572 cases of breast lumps, 3,823 cases of thyroid swellings, 2,984 cases of soft tissue swelling and 50 cases of scrotal swelling. There were 1,355 cases of palpable swelling which fell into miscellaneous group including swellings in oral cavity.

FNAC were done using 10 ml syringe and 22 gauge needle under aseptic precautions. Aspirated material was spread on slides. In case of cystic lesions, cyto-centrifugation of fluid was carried out and repeats FNAC from the residual swelling was also carried out. Air dried smears were stained with Giemsa stain. Out of all these cases of FNAC, there were incidental findings of microfilaria in 20 cases. All these slides were reviewed again to reaffirm the diagnosis of filariasis.

RESULTS

The incidental finding of microfilaria was found in 20 cases accounting for only 0.078% of total FNACs carried out at the center. Out of these 20 cases of superficial swellings diagnosed as filariasis on FNAC, there were 17 cases in third and fourth decades of life. There were only three cases in 5th decade of life while no case was seen below the age of 20 years. The disease was equally prevalent in males and females (M: F = 1:1). The records revealed that in none of the situation, the clinical diagnosis of filariasis was made by the clinicians. It was only after diagnosis on FNAC, treatment for the disease was started.

All the patients presented to the clinician with history of slowly growing swelling. The size of swelling ranged from 1 cm to 10 cm. While four of the 20 cases had history of fever, seven patients

Clinical & hematological findings	Lymph nodes	Testiculoscrotal region	Soft tissue	Thyroid	Breast	Total
Palpable Swelling	6	6	3	3	2	20
Fever	2	0	1	0	1	4
Pain	2	2	2	0	1	7
Associated complaints	0	Hydrocele (2) Primary infertility(2)	0	Nodular enlargement (2) diffuse Hyperthyroidism (1)	0	0
Peripheral blood smear-						
Eosinophilia	3	0	3	0	1	7
Microfilaremia	1	1	1	0	0	3

[Table/Fig-1]: Clinical and haematological presentation of filariasis (n=20)

	Lymph nodes (6)	Testiculoscrotal region (6)	Soft tissue (3)	Thyroid (3)	Breast (3)	Total
Nature of aspirate from swelling						
Clear Fluid	4	2	3	0	1	10
Hemorrhagic	1	3	0	1	1	6
Pus like	0	2	0	0	0	2
Colloid	-	-	-	2	-	2
Special associated features on microscopy						
Granulomas	0	0	1	1	0	2
Other Features	Florid Reactive hyperplasia (2)	Secondary maturation arrest (2)	--	Colloid Goitre(2) Lymphocytic Thyroiditis (1)	{Cluster of benign ductal epithelial cells (1)}	

[Table/Fig-2]: Aspirate morphology and background Cytology: (n=20)

complained of some degree of pain. Two patients had associated complaint of infertility with testicular swelling. The duration of disease ranged from weeks to years.

Out of the 20 cases of superficial swellings diagnosed as filariasis on FNAC, the commonest site involved were swellings from testiculoscrotal region (six cases) (12% of total cases of Testiculoscrotal swelling) and lymph nodes swellings (six cases) (0.047% of the total cases of lymph node swellings). Three cases of filariasis were diagnosed on thyroid swelling (0.08% of thyroid swellings), three cases on soft tissue swelling (0.10% of soft tissue swellings) and two cases of filariasis on breast lumps (0.044 of breast lumps).

Peripheral smears showed eosinophilia in seven cases. Out of these seven cases which showed eosinophilia (ranging from 10 to 39%), three cases had lymph node enlargement, and three had soft tissue swelling while one patient had presented with breast lump. Microfilaremia was detected in three cases, one case each of lymph node swelling, testiculoscrotal swelling and soft tissue swelling [Table/Fig-1].

On FNAC, clear fluid was aspirated in 10 cases, blood mixed in six and purulent in two. Colloid was aspirated in two cases of thyroid swellings. Granulomas were seen in two cases- one each in a thyroid aspirate and a soft tissue swelling aspirate. Reactive lymphoid cells were seen in two cases from lymph node. Secondary maturation arrest was seen in aspirate from the atrophic testis in case of a spermatic cord nodule. Aspirate from spermatic cord nodule revealed few microfilaria. One of the aspirates from thyroid showed features of lymphocytic thyroiditis, while the other two showed features of colloid goiter with only an occasional microfilaria. Only few clusters of benign ductal epithelial cells were seen in one

Anatomical site	Microfilaria	Eggs	Adult worm	Total cases
Lymph nodes (6)				
Axilla	4	1	0	4
Cervical	2	0	0	2
Testiculo-scrotal region (6)				
Scrotal	2	0	0	2
Epididymal Nodule	3	1	1	3
Spermatic Cord Nodule	1	0	0	1
Soft tissue (3)				
Arm	3	0	1	3
Breast (2)	2	1	0	2
Thyroid (3)	3	0	0	3

[Table/Fig-3]: Anatomical sites and stages of filaria parasite seen on FNAC: (n=20)

of the two breast aspirates along with microfilaria. Cell adherence of inflammatory cells and macrophages to microfilaria was seen in four out of 20 cases [Table/Fig-2].

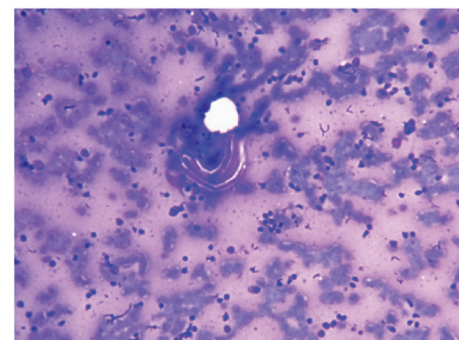
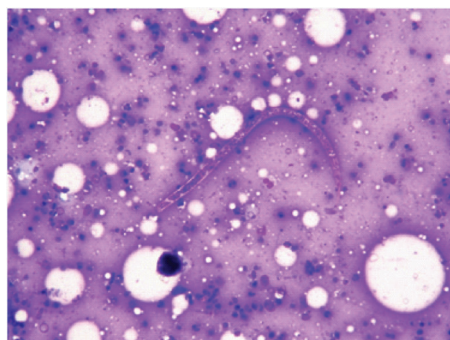
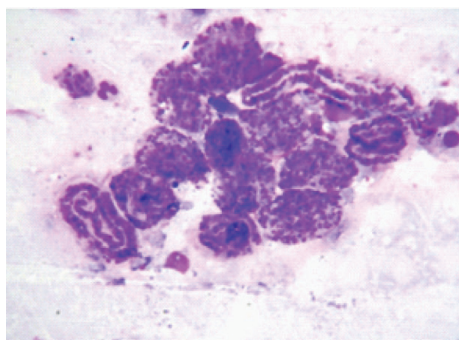
Smears prepared from aspirates revealed sheathed microfilariae with a central column of nuclei. Cephalic and tail ends were free from nuclei (somatic cells). The number of microfilariae varied from single to numerous (over 100s) per slide. Many coiled larvae were seen in four cases and embryoid bodies were seen in three cases. Adult worms were seen in two cases [Table/Fig-3]. Adult gravid female worm with embryoid bodies and discharging numerous larvae were seen in two cases. Adult male worm was seen in one case. The male worm was thinner and smaller than the female worm. The causative agent in all the cases was *Wuchereria bancrofti* [Table/Fig-3].

DISCUSSION

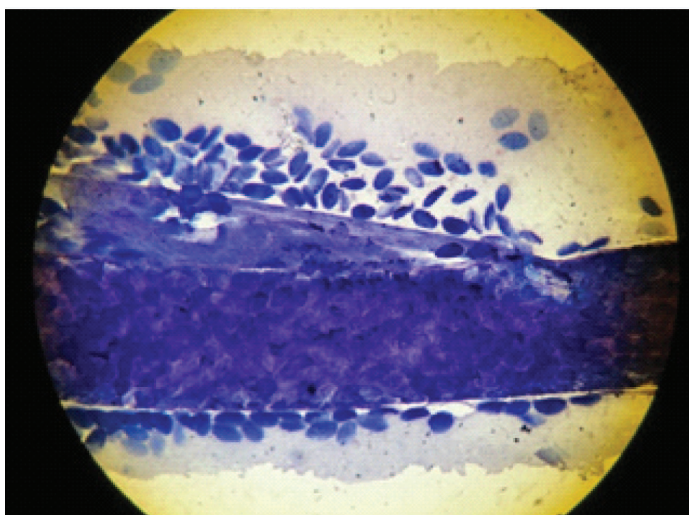
Filariasis is a major public health problem in tropical countries, including India. It is caused by nematodes *Wuchereria bancrofti*, *Brugia malayi*, *B. timori*, *Loa-loa*, *Onchocerca volvulus*, *Mansonella perstans*, *M.ozzardi* and *M.ozzardi* [1]. *Wuchereria bancrofti* (95%) and *Brugia malayi* (5%) are the most common species causing filariasis in India [2]. Adult worms live in the lymphatic channels of the definitive host and microfilaria is released and circulated in the peripheral blood. Female *W. bancrofti* measures 80–100 × 0.25 mm and the male 40 × 0.1 mm. The disease most frequently involves lymphatics of lower limbs, retroperitoneal tissue, spermatic cord, epididymis and mammary gland [4,5].

At our institution from April, 2003 to March, 2013, a total of 25,468 were carried out from superficial sites. Microfilaria can be easily diagnosed using hematoxylin stain, Giemsa stain or methylene blue and eosin. We have been using Giemsa stain at our centre. The incidence of detection of microfilaria was only 0.078% (Total 20 cases). In none of those situations, the patient was referred for FNAC with the suspicion of Filariasis as primary diagnosis. Presence of microfilaria at these sites was more of an incidental finding. Similar observations of very low detection rate of microfilaria from superficial sites have been reported by some authors [6]. In our study, the causative agent in all cases was *W. bancrofti* similar to the national survey in India which puts estimates of 95% cases caused by *W. bancrofti* [3].

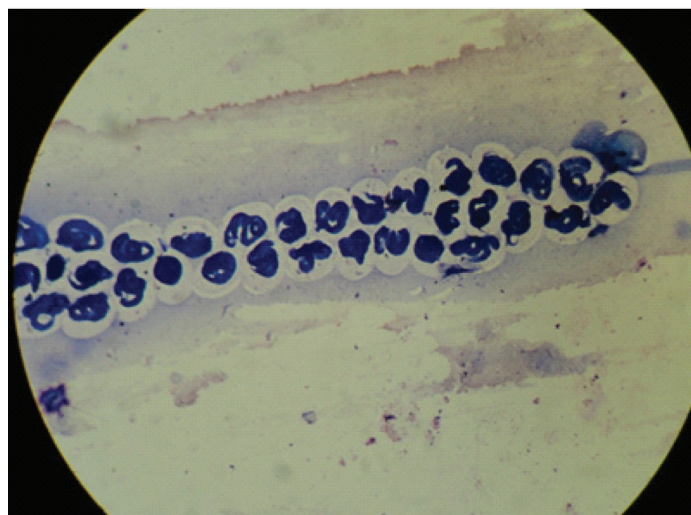
Six cases of swellings in testicular-scrotal region showed microfilariae [Table/Fig-4]. Thus, there was significant incidental detection of microfilaria on FNAC in cases of these swelling (12% of the total 50 cases of testiculoscrotal swellings). Most of Indian studies have also reported testiculoscrotal region as a common site for complications of Filariasis in India [2]. The lymphatic vessels of spermatic cord appear to be common and perhaps the principal site of adult *Wuchereria bancrofti* in men with asymptomatic microfilaremia. Occurrence of living *W. bancrofti* in scrotal area of men was also



[Table/Fig-4]: 40x10X Aspirate from epididymal nodule showing coiled microfilariae and embryonated eggs **[Table/Fig-5]:** 20x10X Aspirate from breast lump showing ensheathed microfilaria of *W. bancrofti* in the background of acute inflammatory cells **[Table/Fig-6]:** 20x10X Ensheathed microfilaria of *W. bancrofti* in a background of reactive lymphoid cells & colloid in a thyroid aspirate



[Table/Fig-7a]: 40x10X Aspirate from soft tissue swelling showing adult gravid worm with numerous eggs



[Table/Fig-7b]: 40x10X Another field of same slide Fig 4(a) showing numerous coiled microfilariae

reported [6-8]. We had two cases where adult worm was detected in testiculoscrotal swellings. Noroes et al., [9] also reported a case of adult worm *W. bancrofti* in scrotal swelling. Two of the cases in our series came to the hospital with primary complaint of infertility but records did not support filariasis as an etiological cause of infertility. Six cases of superficial lymph nodes (4 axillary and 2 cervical) accounted for 30% of the total diagnosed cases. Aspirates from lymph nodes demonstrated microfilariae in a background of reactive lymphoid cells. Similar observations in many case reports have been noticed in literature [5,6,8,10].

Breast lumps are a very rare site for detection of microfilaria. We had only two cases of breast aspirates [Table/Fig-5] which showed microfilaria out of 4,572 breast lumps. There are few isolated reports of incidental finding of microfilariae in breast lumps on FNAC smears [7,10,11].

Demonstration of microfilaria in Thyroid swelling is also very unusual. Presence of microfilaria have been reported in thyroid by Yenkeswar et al., [5], Kishore et al., [7] Varghese et al., [10] and Chowdry et al., [12]. We had three such cases amongst 3,823 of thyroid swelling subjected for FNAC. Whereas one thyroid aspirate showed microfilaria in a background of lymphocytic thyroiditis, while the two revealed microfilaria in a background of colloid goiter [Table/Fig-6].

Aspirates from soft tissue swelling in arm showed microfilaria in four cases. In one of these cases adult gravid worm and eggs were also seen [Table/Fig-7a,7b]. The incidence of finding microfilaria in soft tissue swellings is very low. Demonstrations of microfilariae from similar sites have also reported by other workers [5,8,13]. Out of 20 cases showing microfilariae in FNAC smear examination, blood eosinophilia was present in 35% cases (seven cases). Three of these seven cases showed microfilaremia in nocturnal venous blood smear examination, accounting for only 15 % of the total 20

cases diagnosed on FNAC. Findings are consistent with observation made by others [8,14]. Thus, we conclude that in a large number of cases, filariasis can occur even without microfilaraemia.

Significant adherence of inflammatory cells and macrophages to microfilariae was present in four out of 20 cases. Cell adherence to microfilaria of *W. bancrofti* was reported by other workers also [8,15].

Recently, specialized test based upon principles of immunochromatography, Polymerase chain reaction (PCR) and Enzyme linked immunosorbent assays (ELISA) with high sensitivity and specificity [16] have been introduced but still the gold standard for confirmed diagnosis is demonstration of the microfilaria in the smear.

CONCLUSION

To conclude, in this retrospective study we observed that there is a significant possibility of finding microfilaria in patient with testiculoscrotal swellings and clinician should always consider its possibility in these cases. However, despite high incidence of filariasis in an endemic country like India, detection of microfilaria in other superficial locations on FNAC is rare. Careful screening of FNAC smears is very important as it provides definitive diagnosis of filariasis even in situations where the clinician has not suspected the disease. The prompt recognition and administration of specific treatment can help preventing the severe manifestations of lymphatic filariasis.

REFERENCES

- [1] Thomas B. Nutman, Peter F Weller. Filarial and related Infections: Harrison's Principles of Internal Medicine: 16th Edition Mc Graw Hill: Vol. 1 Page1260-63.
- [2] Park K. Lymphatic Filariasis: Park's textbook of preventing and social medicine, 22nd Edition 2013. Jabalpur. Banarasidas Bhanot: Page 245-50.

- [3] India. Ministry of Health and Family Welfare. *Annual report*. 2010-2011. New Delhi: Department of Health and Family Welfare, Government of India; 2011. p. 349.
- [4] Sodhani P, Nayar M. Microfilariae in a thyroid aspirate smear: An incidental finding. *Acta cytol*. 1989; 33:942-43.
- [5] Yenkeswar PN, Kumbhalkar DT, Bobhate SK. Microfilariae in fine needle aspirate: A report of 22 cases. *Indian J Pathology & Microbiology* 2006; 49:365-69.
- [6] Mitra SK, Mishra RK, Verma P. Cytological diagnosis of microfilariae in filariasis endemic areas of eastern Uttar Pradesh. *J of Cytol*. 2009; 26(1): 11-14.
- [7] Kishore B, Khare P, Gupta RJ, Bisht SP. Microfilaria of *Wuchereria bancrofti* in cytologic smears: a report of 5 cases with unusual presentations. *Acta Cytol*. 2008; 52:710-12.
- [8] Kumar B, Karki S, Yadava SK. Role of Fine Needle Aspiration Cytology in Diagnosis of Filarial Infestation. *Diagn. Cytopathol*. 2011; 39 (1):8-12.
- [9] Noroes J, Addiss D, Amara F, Coutinho A, Medeiros Z, Dreyer G. Occurrence of living adult *Wuchereria bancrofti* in scrotal area of men with microfilaremia. *Trans R Soc Trop Med Hyg*. 1996;90:55-56.
- [10] Varghese R, Raghuveer CV, Pai MR, Bansal R. Microfilariae in cytologic smear: A report of six cases. *Acta Cytol*. 1996;40(2):299-301.
- [11] Kapila K, Verma K. Diagnosis of parasites in fine needle breast aspirates. *Acta Cytol*. 1996;40(4):653-56.
- [12] Chowdry M, Langes S, Agarwal M, Agarwal C. Microfilaria in thyroid gland nodule. *Indian J Pathol Microbiol*. 2008; 51: 94-96.
- [13] Pandit AA, Shah RK, Shenoy SG. Adult filarial worm in a fine needle aspirates of a soft tissue swelling. *Acta Cytol*. 1997; 41(3):944-46.
- [14] Beaver PC. Filariasis without microfilaremia. *Am J Trop Med Hyg*. 1970; 19:182-89.
- [15] Pandit CG, Pandit SR, Iyer IV. The adhesion phenomenon in filariasis: A preliminary note. *Indian J Med Res*. 1929; 16:946-53.
- [16] Gurjeet Singh; Raksha; A.D. Urhekar: Advanced Techniques for Detection of Filariasis -A Review. *International Journal of Research Studies in Biosciences*. 2013;1(1): 17-22.

PARTICULARS OF CONTRIBUTORS:

1. Consultant & Head, Department of Pathology, Dr. B.S. Ambedkar Hospital, New Delhi, India.
2. Senior Resident, Department of Pathology, Dr. B.S. Ambedkar Hospital, New Delhi, India.
3. Senior Resident, Department of Dermatology, Safdarjung Hospital New Delhi, India.
4. Senior Resident, Department of Pathology, Dr. B.S. Ambedkar Hospital, New Delhi, India.
5. Senior Resident, Department of Pathology, Dr. B.S. Ambedkar Hospital, New Delhi, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Pratima Khare,
Consultant & Head, Department of Pathology, Dr. B.S. Ambedkar Hospital, Rohini, New Delhi-110085, India.
Phone : 0091-9968679778

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **May 28, 2014**

Date of Peer Review: **Jul 24, 2014**

Date of Acceptance: **Sep 17, 2014**

Date of Publishing: **Dec 05, 2014**