Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

Filariasis on cytology of clinically unsuspected sites trapped accidentally on aspiration – A challenge ahead.

Dr. Richa Bhartiya[1], Dr. Pallavi Mehra[2]*, Dr. Vishal Tayade[3], Dr.Dipika Bongale[4], Dr. Manasi Karwa[4], Dr. Navin Kumar Bariar[5]

[1]Associate Professor, Department of Pathology, Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, Maharashtra, India.
[2]Associate Professor, Department of Pathology, Patna Medical College & Hospital, Patna, Bihar, India.
[3]Assistant Professor, Department of Pathology, Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, Maharashtra, India.
[4]Junior Resident, Department of Pathology, Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, Maharashtra, India.
[5]Professor and Ex-HOD, Pathology, Department of Pathology, Patna Medical College & Hospital, Patna, Bihar, India.

Abstract

Background

Incidental detection of microfilariae in fine-needle aspiration cytology (FNAC) specimens from clinically unsuspected sites is uncommon but clinically important, particularly in filariasis-endemic regions. This study evaluated the clinicopathological spectrum of incidental filariasis detected on FNAC and highlighted the diagnostic utility of cytology in identifying occult infections.

Materials and Methods

This retrospective observational study included 33 cases of incidental microfilarial detection on FNAC diagnosed at the Department of Pathology, Patna Medical College and Hospital, India, between January 2012 and January 2022. Clinical details, anatomical sites, cytomorphological findings, peripheral blood smear results, and eosinophil counts were reviewed. Cases with peripheral blood microfilaremia were excluded.

Results

Thirty-three patients (20 males and 13 females; age range: 12–80 years) were studied. Microfilariae were detected in subcutaneous swellings (n=8), breast lesions (n=7), lymph nodes (n=7), liver lesions (n=4), mediastinal masses (n=2), and single cases involving the thyroid, lung, gallbladder, periampullary region, and parietal wall. None of the patients had clinical suspicion of filariasis before cytological examination. Eight cases were associated with malignant lesions, while the remainder occurred with benign or inflammatory conditions. Peripheral blood smears were negative in all cases, and eosinophilia was present in only seven patients.

Conclusion

FNAC is a rapid, minimally invasive, and cost-effective modality for detecting occult filariasis at clinically unsuspected sites. Microfilariae may coexist with a wide range of benign and malignant lesions even in the absence of peripheral microfilaremia or eosinophilia.

Recommendation

Routine and meticulous screening of all cytology smears for microfilariae is recommended in endemic regions irrespective of clinical suspicion, as early detection facilitates timely treatment and appropriate management of associated lesions.

Keywords: *Wuchereria bancrofti; lymphatic filariasis; fine-needle aspiration cytology; microfilaria; cytopathology.*
Submitted: *April 15, 2026* ***Accepted:*** *May 19, 2026* ***Published:*** *June 30, 2026*

Corresponding Author: *Pallavi Mehra*
Email: *dr.pallavimamc@gmail.com*
Associate Professor, Department of Pathology, Patna Medical College & Hospital, Patna, Bihar, India.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

Introduction

Filariasis is a major global health problem. It is endemic in more than 80 countries, with more than 1.3 billion people at risk and 120 million already infected globally. Two-thirds of the endemic population resides in South-East Asia, and one-third lives in India [1]. Considering this, the Global Program to Eliminate Lymphatic Filariasis (GPELF) was launched by the World Health Organization (WHO) in 2000 to eliminate LF as a public health problem by the year 2020. This 2020 target was not achieved and the WHO has since extended the goal under the 2021–2030 Neglected Tropical Diseases road map, which aims for validation of elimination of LF as a public health problem in at least 80% of endemic countries by 2030 [2,3] From the launch of GPELF in 2000 through the end of 2023, more than 9.7 billion cumulative treatments had been delivered to over 943 million people in 71 countries, and the global population requiring preventive chemotherapy had fallen by 58.6%; nevertheless, 657 million people in 39 countries still required treatment as of the 2024 WHO progress report [4]. In India, it is estimated that filariasis is endemic in 17 States and six Union territories, and 554.2 million people are at risk of lymphatic filariasis [2]. India has subsequently set a national target of eliminating LF as a public health problem by 2027, three years ahead of the global goal [5]. The microfilaria wanders in lymphatics and can be accidentally trapped in the needle during fine needle aspiration cytology (FNAC). Accurate recognition and detection of the parasite leads to the institution of specific treatment and prevents chronic manifestations of the disease. Although incidental detection of microfilariae in FNAC specimens from clinically unsuspected sites has been described in isolated reports and small case series, comprehensive analyses evaluating their clinicopathological spectrum remain limited. The present study was therefore undertaken to evaluate the clinicopathological profile of incidental filariasis detected on FNAC from clinically unsuspected anatomical sites and to emphasize the diagnostic utility of cytology in identifying occult filarial infections in endemic regions.

Materials and Methods

Study Design

This retrospective observational study was conducted to evaluate the clinicopathological spectrum of incidental filariasis detected on fine-needle aspiration cytology (FNAC) specimens obtained from clinically unsuspected sites.

Study Setting

The study was carried out in the Department of Pathology, Patna Medical College and Hospital (PMCH), Patna, Bihar, India, a tertiary care teaching hospital that provides comprehensive diagnostic and treatment services in medical and surgical specialties and serves as a major referral centre for Bihar and neighbouring states. The study included cases diagnosed over ten years from January 2012 to January 2022.

Participants

All patients in whom microfilariae were incidentally detected on FNAC smears from clinically unsuspected anatomical sites during the study period were eligible for inclusion.

Inclusion Criteria

- Cytologically confirmed presence of microfilariae in FNAC specimens.
- Cases in which filariasis was not clinically suspected before cytological examination.
- Availability of relevant demographic, clinical, and laboratory information.

Exclusion Criteria

- Patients with peripheral blood microfilaremia.
- Cases with incomplete clinical or laboratory records.
- Cases in which filariasis was clinically suspected before FNAC.

Bias

To minimize selection bias, all consecutive eligible cases diagnosed during the study period were included in the analysis. Cytological smears were reviewed by experienced cytopathologists using standard diagnostic criteria to reduce observer bias.

Variables

The primary outcome variable was incidental detection of microfilariae on FNAC. Demographic characteristics (age and sex), anatomical site of aspiration, clinical presentation, provisional clinical diagnosis, cytomorphological findings,

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

associated benign or malignant lesions, peripheral blood smear findings, and eosinophil counts were evaluated. Potential confounding variables included associated inflammatory and neoplastic conditions that could influence clinical presentation.

Data Sources and Measurements

Clinical and laboratory information was retrieved from departmental cytopathology records and hospital medical records. FNAC was performed using a 22–23-gauge needle attached to a 10 or 20 mL disposable syringe by trained pathologists under standard aseptic precautions. Smears were prepared and stained using routinely employed cytological stains including May-Grünwald-Giemsa, Papanicolaou, and Hematoxylin and Eosin stains wherever appropriate. Peripheral blood smear findings and eosinophil counts were obtained from corresponding hematological records.

Statistical Methods

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Continuous variables were summarized as mean ± standard deviation or range, while categorical variables were expressed as frequencies and percentages. Owing to the descriptive nature of the study and absence of comparison groups, no inferential statistical analyses or adjustment for confounding variables were performed. Cases with incomplete data were excluded from analyses involving the missing variables.

Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Approval for the study was obtained from the Institutional Ethics Committee of Patna Medical College and Hospital, Patna, Bihar, India. The approval number and date may be added if available from institutional records.

Informed Consent

As this was a retrospective study based on archived cytology records and anonymized patient data, the requirement for written informed consent was waived by the Institutional Ethics Committee. Patient confidentiality and anonymity were maintained throughout the study.

Results

A total of 33 cases of incidental filariasis detected on FNAC from clinically unsuspected sites were included in the study. The patients ranged in age from 12 to 80 years, with a mean age of approximately 36.8 years. There was a male predominance, with 20 males (60.6%) and 13 females (39.4%), resulting in a male-to-female ratio of 1.5:1.

The most common sites of incidental microfilarial detection were subcutaneous swellings (8 cases, 24.2%), followed by breast lesions (7 cases, 21.2%) and lymph nodes (7 cases, 21.2%). Other sites included the liver (4 cases, 12.1%), mediastinum (2 cases, 6.1%), and single cases involving the thyroid, lung, gallbladder, periampullary region, and parietal wall (3.0% each) (Table 1).

Demographic and Clinical Characteristics of Patients with Incidental Filariasis Detected on FNAC (n = 33)

Site of lesion	Number of cases, n (%)	Age range (years)	Male, n	Female, n	Common clinical presentation
Subcutaneous swelling	8 (24.2)	12–38	7	1	Soft tissue swelling
Breast	7 (21.2)	23–52	0	7	Breast lump or lumpiness
Lymph node	7 (21.2)	26–60	5	2	Lymphadenopathy
Liver	4 (12.1)	35–80	3	1	Abdominal pain, liver SOL
Mediastinum	2 (6.1)	26–28	2	0	Mediastinal mass
Thyroid	1 (3.0)	22	0	1	Thyroid nodule
Lung	1 (3.0)	42	1	0	Lung mass with pleural effusion
Gallbladder	1 (3.0)	50	0	1	Painful abdominal lump
Periampullary region	1 (3.0)	58	1	0	Pain abdomen with jaundice

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

Site of lesion	Number of cases, n (%)	Age range (years)	Male, n	Female, n	Common clinical presentation
Parietal wall	1 (3.0)	47	1	0	Periumbilical swelling
Total	**33 (100)**	**12–80**	**20**	**13**	—

None of the patients had a prior clinical suspicion of lymphatic filariasis before cytological examination. The provisional clinical diagnoses varied widely and included benign conditions such as lipoma, fibrocystic disease, reactive lymphadenitis, breast abscess, and colloid goiter, as well as malignant lesions including adenocarcinoma, periampullary carcinoma, and thymoma.

Microfilariae were identified either in isolation or admixed with inflammatory cells, benign epithelial elements, or malignant cells. **Eight cases (24.2%)** demonstrated coexistence of microfilariae with malignant lesions, including lung adenocarcinoma, metastatic liver lesions, gallbladder adenocarcinoma, periampullary carcinoma, thymoma, and atypical lymphoid neoplasms. The remaining **25 cases (75.8%)** were associated with benign or inflammatory conditions (Table 2).

Cytomorphological Findings and Associated Lesions in Cases of Incidental Filariasis Detected on FNAC (n = 33)

Site	Provisional clinical diagnosis	Cytological findings	Associated lesion
Thyroid	Colloid goitre, lymphocytic thyroiditis	Microfilariae with benign follicular epithelial cells and colloid	Colloid goitre
Lung	Lung carcinoma	Adenocarcinoma cells with microfilariae	Adenocarcinoma
Liver	Metastatic carcinoma	Malignant epithelial cells with microfilariae	Metastatic adenocarcinoma
Gallbladder	Neoplastic lesion	Adenocarcinoma with microfilariae	Gallbladder adenocarcinoma
Periampullary region	Periampullary carcinoma	Adenocarcinoma with microfilariae	Periampullary adenocarcinoma
Mediastinum	Lymphoma/leukaemia	Thymic epithelial cells or atypical lymphoid cells with microfilariae	Thymoma and lymphoid neoplasm
Breast	Fibrocystic disease, abscess, lactating adenoma, carcinoma breast	Microfilariae admixed with ductal epithelial cells, inflammatory cells, and macrophages	Fibrocystic changes, mastitis, lactating adenoma
Subcutaneous swelling	Lipoma, neurofibroma, haemangioma	Isolated microfilariae with minimal inflammatory response	None
Parietal wall mass	Lipoma, metastatic lesion	Skeletal muscle fragments with inflammation and microfilariae	Myositis
Lymph node	Tuberculosis, reactive lymphadenitis, venereal disease	Reactive lymphoid cells with microfilariae	Reactive lymphadenitis
Total	—	—	**8 malignant and 25 benign/inflammatory lesions**

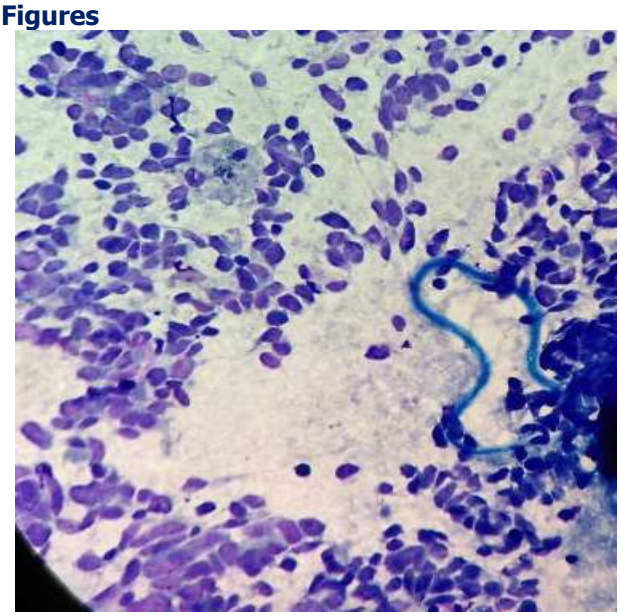
Among the breast lesions, cytological findings ranged from fibrocystic changes and lactating adenoma to inflammatory mastitis. One patient presented with an ulcerative breast mass clinically suspected to be carcinoma but was

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

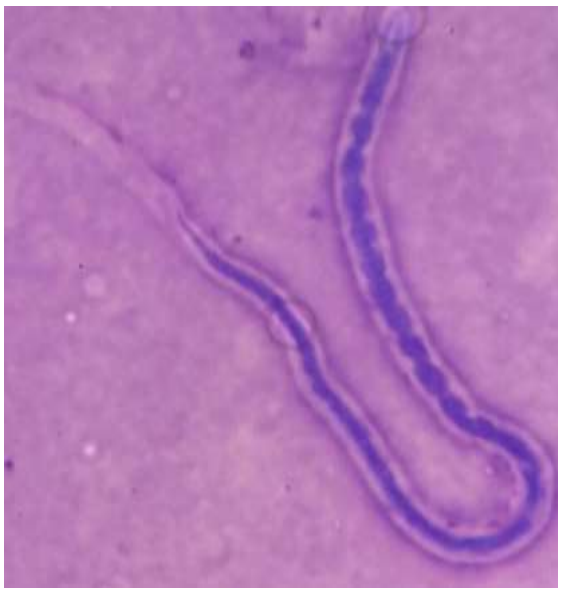
subsequently diagnosed as inflammatory mastitis with associated microfilariae. Similarly, none of the seven lymph node cases demonstrated clinical features suggestive of lymphatic filariasis, and in the five male patients with inguinal lymphadenopathy, the scrotum and adjacent structures were clinically normal.

Peripheral blood smear examination was negative for microfilaremia in all patients. Eosinophilia was observed in only **seven cases (21.2%)**. None of the patients had clinical manifestations or complications attributable to lymphatic filariasis at presentation.

Figures

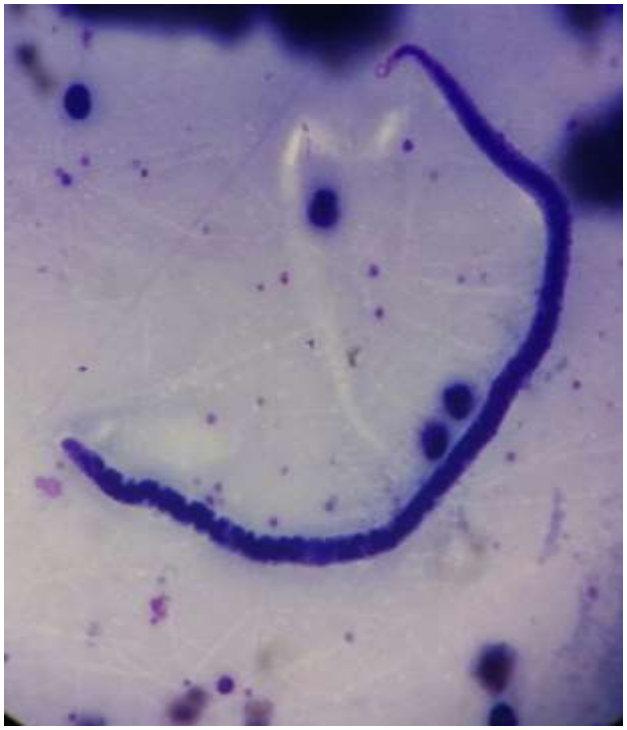


Table/Fig-2 Cytosmears are cellular and show thymic epithelial cells in sheets with entangled microfilaria of Waucheria bancrofti (PAP x40X)

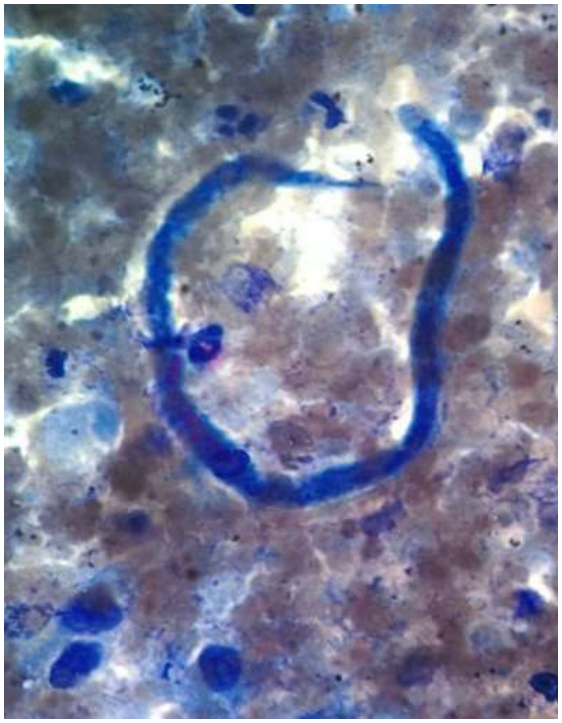


Table/Fig-3 Microfilaria of Waucheria bancrofti with lymphocytes and colloid material in background (Giemsa x100X)

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

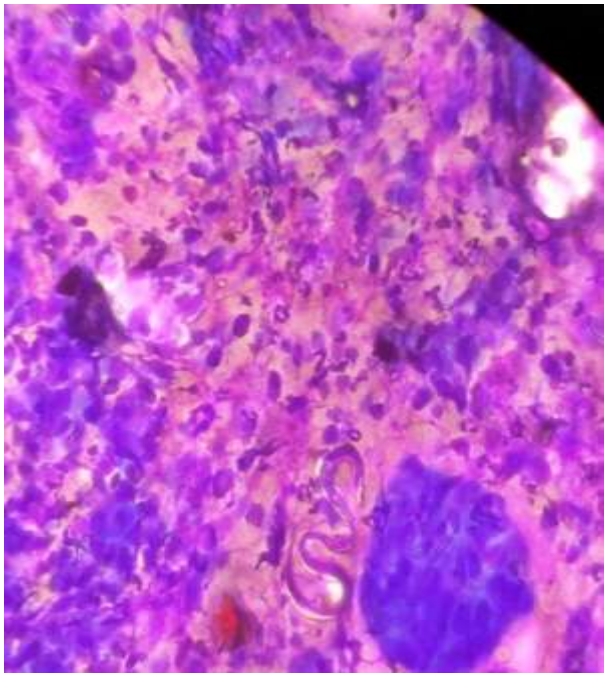


Table/Fig-4 Cytosmears show microfilaria of Waucheria bancrofti showing tail-end nucleus-free with few foamy macrophages and ductal epithelial cells.

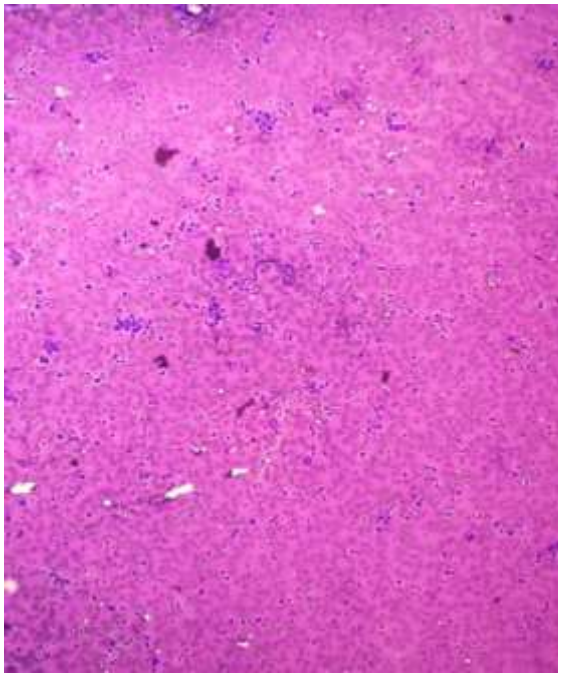


Table/Fig-5 Cytosmears show tumour cells along with microfilaria of Waucheria bancrofti with adhered neutrophils (PAP x40X)

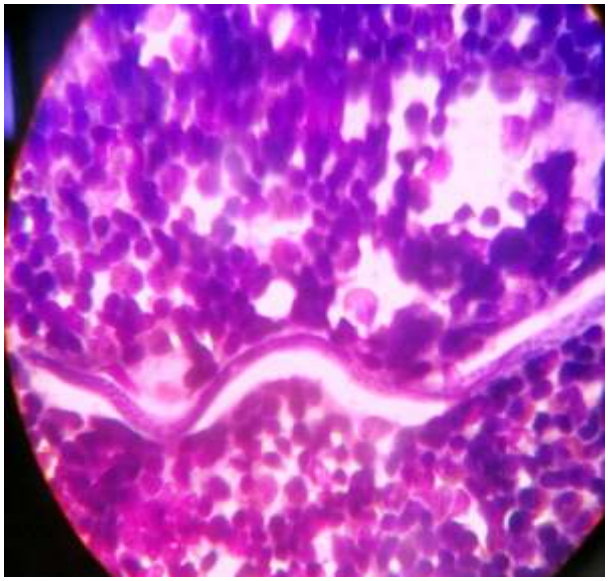
Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

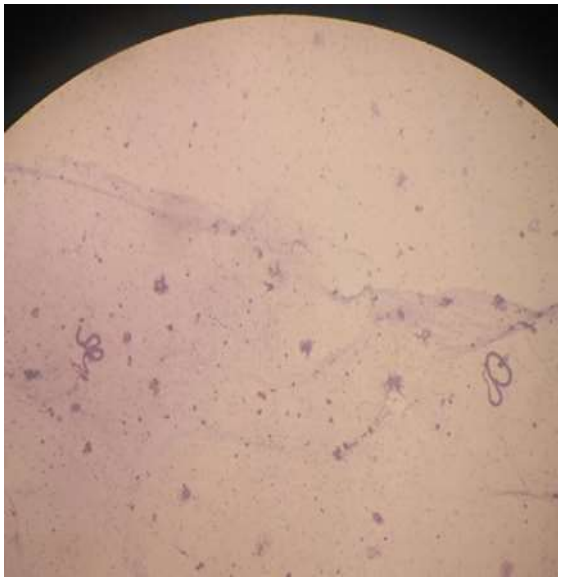


Table/Fig-6 Cytosmears are cellular shows acini of tumour cells along with microfilaria of Waucheria bancrofti (Giemsa x40X)



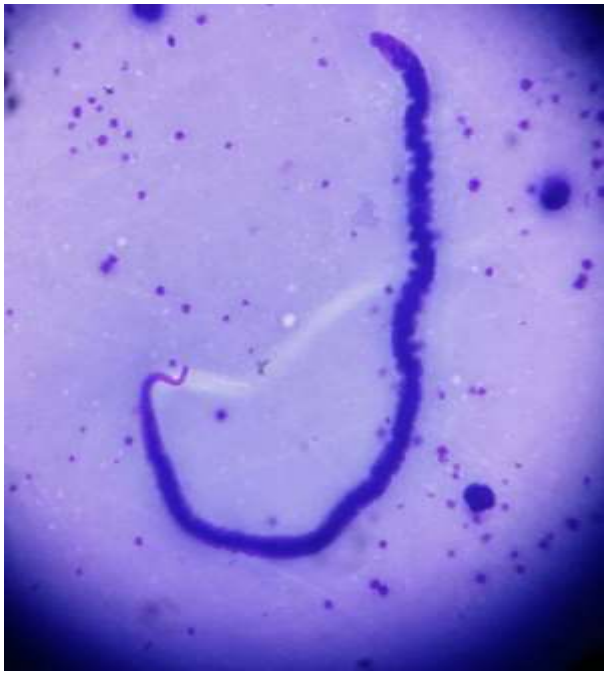
Table/Fig-7 Cytosmears show tumour cells in small acini with microfilaria of Waucheria bancrofti in between (H&E x10X)



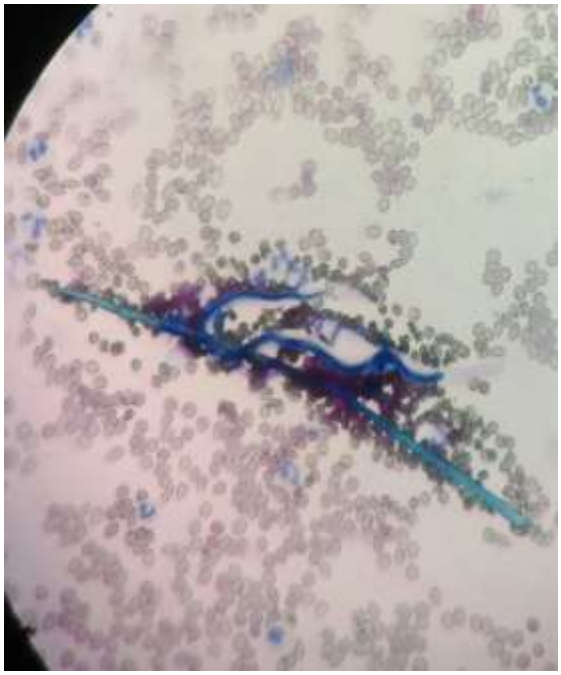


Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

Table/Fig-8 Cytosmears are cellular and show dense inflammatory cells comprising neutrophils, lymphocytes, and eosinophils along with microfilaria of Waucheria bancrofti (Giemsa x40X)



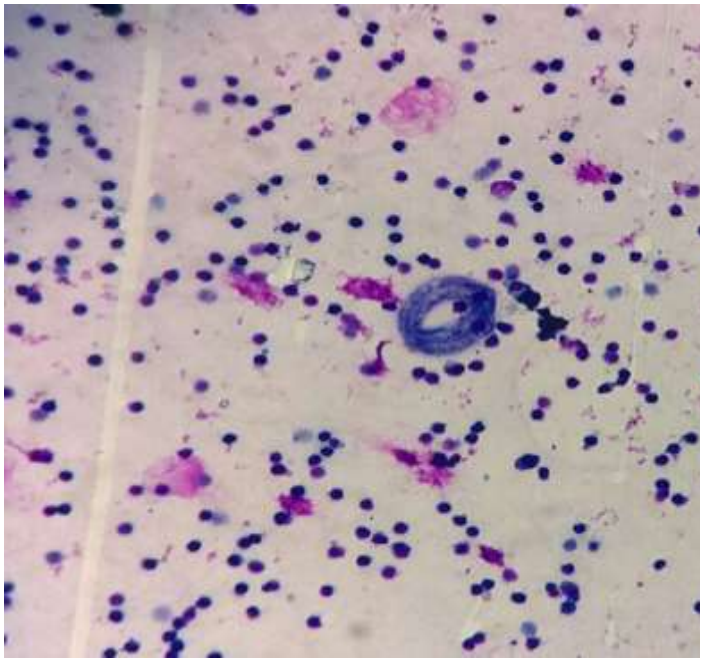
Table/Fig-9 Cytosmears show coiled microfilaria of Waucheria bancrofti with few ductal epithelial cells against an eosinophilic background.



Table/Fig-10 Cytosmear showing microfilaria of Waucheria bancrofti with a few ductal epithelial cells and inflammatory cells.

Table/Fig-11 Cytosmears show microfilaria of Waucheria bancrofti with inflammatory cells and RBCs in the background (Giemsa x10X)

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article



Table/Fig-12 Cytosmears show reactive lymphoid cells along with microfilaria of Waucheria bancrofti (Giemsa x10X)

Discussion

Filariasis is a tropical disease transmitted by Culex mosquitoes, and 98% of lymphatic filariasis cases are caused by the parasite Wuchereria bancrofti (W. bancrofti), followed by Brugia malayi and Brugia timori. The study revealed W.bancrofti infection in all the cases. The microfilariae of W.bancrofti and B.malayi display nocturnal periodicity. The disease mainly involves the lymphatic system. In the endemic zones, people become infected early in their lifetime and develop microfilaremia, reaching a peak between 15 and 20 years of age. Its diagnosis is conventionally made by demonstrating microfilaria in the peripheral blood smear [3, 4]. Man is the definitive host, and the mosquito is the vector and intermediate host. Mosquitoes deposit infective larvae on the skin, where they develop into adult worms over a period of 6months – 2years in the lymphatics. In the lymphatic vessels, the gravid female releases a large number of microfilariae. W. bancrofti is ovoviviparous, where the parasite lays eggs with well-developed embryos within it; however, in general, filarial parasites are viviparous. The larvae pass through the thoracic duct and pulmonary capillaries to the peripheral blood [5].

The clinical manifestations of lymphatic filariasis are variable. These patients are mostly asymptomatic or may present with an acute attack characterized by fever, lymphangitis, lymphadenitis, epididymo-orchitis, and funiculitis, or chronically with lymphedema, hydrocele, mass or swellings of unsuspected sites. Less frequently, there may be chyluria or tropical eosinophilia [6]. Tropical pulmonary eosinophilia is a distinct syndrome characterized by paroxysmal cough and wheezing that are usually nocturnal, low-grade fever, weight loss, and lymphadenopathy. It is now considered to be a form of occult filariasis in which rapid clearance of the microfilariae occurs, presumably on the basis of host immunologic hyper-responsiveness to the parasite [7]. Various reports describe the variable tissue reactions ranging from intense inflammatory reaction of neutrophils, lymphocytes, eosinophils, epithelioid cells to foreign body giant cell

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

reaction. Liquefaction necrosis, Charcot-Leyden crystals, and degranulated eosinophils have also been described. These reactions are mostly elicited on histopathology; their demonstration on cytology is difficult [8].

Filariasis may present as single or multiple nodules in subcutaneous locations. In skin and subcutaneous tissue, it is caused by Onchocerca volvulus and Loa Loa. In this study, eight cases presented with subcutaneous swellings, and none of them was clinically suspected for filariasis. All the cases were asymptomatic. It is very important to be aware of this entity, especially in tropical countries like India where filariasis is endemic; it should be considered as a differential diagnosis of subcutaneous lesions [3, 8, 9]. Microfilaria of thyroid lesions is extremely rare. The possible explanation for this unusual occurrence is the lodgment of the parasite in the thyroid vasculature, including lymphatics [10, 11]. Breast filariasis patients usually present with a solitary, non-tender, painless, and unilateral breast lump. The upper outer quadrant is the most common site. Most of the lesions involve subcutaneous tissue and present as a hard mass with cutaneous attachment. Rarely, it has been noticed in male breasts also. Various case reports are available describing such lesions. In the study, seven cases are included, and all of them presented with variable clinical features from fibrocystic disease to abscess, lactating adenoma to inflammatory breast carcinoma. It is the host inflammatory reaction that is responsible for the wide spectrum of symptoms and signs. Intact worms produce minimal tissue reaction, while degenerating parasites provoke an inflammatory reaction. Mammography of breast filariasis may show the filarial dance sign [12, 13, 14, 15].

A literature review suggests that filaria is the most commonly incidentally detected parasite with various neoplastic and non-neoplastic lesions. Various case reports have been documented for the incidental detection of microfilaria at various unsuspected sites [3, 4, 16, 17]. Chance associations with various neoplastic lesions like infiltrating duct carcinoma, follicular neoplasm of thyroid, multiple myeloma, metastatic deposits, hemangioma of liver, meningioma, squamous cell carcinoma, undifferentiated carcinoma of uterine cervix, lymphangiosarcoma, urinary bladder carcinoma, melanoma, and leukemia have been well described [18]. It has been hypothesized that since tumors have a rich vascular supply, it leads to concentration of the parasite in the neoplastic area. Furthermore, the neoplastic lesions show neoangiogenesis, which are fragile blood vessels, so accidental trauma during FNAC may lead to rupture of vessels, leading to release of parasite at the neoplastic site [19, 20, 21, 22].

The various diagnostic methods suggested for filariasis are night smear examination, immunoassay, polymerase chain reaction, ultrasound, and lymphoscintigraphy. Absence of microfilaria in peripheral blood does not exclude filarial infection. In this study, none of the cases showed peripheral blood microfilaria; however, seven cases showed eosinophilia. Previous studies have demonstrated that there is no consistent relationship between filarial infection and blood eosinophilia, which reflects variable host tissue response. Sometimes intact worms are trapped in the needle and can be macroscopically seen moving on the slide. They can be demonstrated on wet mount preparation. Skin tests are done to detect filarial antigen along with serological detection of filarial antigens and antibody to filarial antigens. Immunological tests like the Indirect Haemagglutination test (IHA test) could also be done. Besides, concentration techniques (nucleopore filtration and Knott concentration), a "provocation" test with Diethylcarbamazine (DEC) drug, and lymphangiography can be done. Polymerase chain reaction can demonstrate the presence of parasite DNA and is now the most sensitive technique. Different primers and probes have been identified that are 100% specific and provide sensitivity that is greater than detection of the parasite itself [23, 24]. Adult filarial worms can be demonstrated in the dilated lymphatics on real-time high-resolution ultrasound (HRUS) by their characteristic wriggling movements known as the filarial dance sign (FDS). FDS is a diagnostic sign of inguino-scrotal filarial infection and breast filariasis [15]. Biopsy is inconvenient for the patient, expensive, and tissue removal further compromises lymph drainage. FNAC is a cheap, easy, and simple procedure, and its value in asymptomatic and clinically unsuspected cases is well documented. It provides definite diagnosis of filariasis and excludes the clinical possibilities of other inflammatory, cystic, and neoplastic lesions. Mere demonstration of parasite in the cytologic smear is enough for diagnosis, and no further investigation is required. Microfilariae of W.bancrofti are characterized by a sheath, which is longer than the larval body; the tail tip is free of nuclei. On the other hand, microfilariae of B.malayi are smaller in size, and nuclei extend to the tail tip. Antigen-based assays have largely displaced night blood smear examination for population-level mapping. Detection of W. bancrofti circulating filarial antigen by the rapid immunochromatographic card test (ICT) and the Filariasis Test Strip (FTS) is now the WHO-

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

recommended tool for transmission assessment surveys and IDA impact surveys, since antigen is detectable irrespective of nocturnal periodicity and removes the need for night blood collection [26]. For B. malayi, the BmR1 and BmSXP recombinant antigens are used in commercial Brugia Rapid and Pan-LF ELISA platforms [24].

Cell adherence to microfilaria is explained by the presence of filarial antibodies (IgE) in the sera of the patient. In a study by Kumar et al, four cases showed cell adherence of neutrophils, eosinophils, macrophages, epithelioid cells, and lymphocytes to filaria. In this study, two cases showed adherence of inflammatory cells and macrophages to the microfilaria [4].

Lymphatic filariasis is targeted for elimination in India through mass drug administration (MDA) with DEC combined with albendazole (ABZ). It has been hypothesized that intestinal helminths could play a role in the survival and persistence of lymphatic-dwelling filarial parasites. The response of adult worms to DEC is variable in different patients, and even in the same patient, different adult worms show varying responses. USG can be used in the follow-up period to document the response of worms to the drugs. Complete absence of worm movements on follow-up is taken as a positive response [2, 25].

In 2017, the WHO recommended a triple-drug regimen of ivermectin, diethylcarbamazine and albendazole (IDA) as an alternative to the standard DA regimen for accelerating LF elimination in areas not co-endemic with onchocerciasis or loiasis. IDA achieves more rapid clearance of microfilariae and requires fewer rounds (typically two to three) to interrupt transmission [29]. India initiated IDA-MDA in five districts in June 2018 and, by December 2023, had scaled it up to 63 endemic districts; sentinel-site data from Maharashtra have shown a decline in microfilaraemia prevalence from 4.91% in 2004 to 0% by 2024 in some districts, and coverage evaluation surveys in Jharkhand in 2024 documented complete household-level MDA coverage of 45–58% after the IDA round [28, 29]. By the end of 2023, 23 countries or territories had been acknowledged by WHO as having eliminated LF as a public health problem, even though 657 million people in 39 countries still required preventive chemotherapy [26]. Despite this accelerated programme, FNAC continues to detect occult microfilariae at clinically unsuspected sites in routine practice; recent case series and reports have documented incidental microfilariae in thyroid neoplasms, axillary swellings, lymph nodes, breast and subcutaneous tissue, as well as in exfoliative cytology samples, including from non-endemic areas of India [30–34]. These reports reinforce the continued role of careful cytological screening in endemic and previously endemic populations during the elimination phase.

The main aim of the study is to raise awareness that in tropical countries where filariasis is endemic, the FNAC smears should be thoroughly screened and filariasis should be kept as a differential diagnosis for lesions at any unsuspected site. Identification of the parasite is important as early diagnosis and treatment can prevent the more severe manifestations of the disease. Careful screening of the FNAC smears might help detect microfilariae, even in asymptomatic patients. Accurate diagnosis can be easily achieved by FNAC without the requirement of biopsy. In non-endemic areas with low levels of microfilaraemia, sensitive and specific immunodiagnostic tests should be performed in daytime and night samples. To conclude, incidental detection of filariasis in various lesions poses a great diagnostic challenge, so pathologists should be very careful while screening the slides irrespective of the clinical suspicion, especially in endemic areas.

Interpretation of Key Findings

The study demonstrated that incidental filariasis detected on FNAC can occur across a wide range of anatomical sites and may coexist with both benign and malignant lesions. Subcutaneous swellings, breast lesions, and lymph nodes constituted the most common sites of detection. Importantly, none of the patients were clinically suspected to have filariasis before cytological examination, highlighting the diagnostic value of meticulous microscopic evaluation of FNAC smears in endemic settings.

A notable finding was the coexistence of microfilariae with malignant lesions in nearly one-quarter of cases. This observation supports previous hypotheses that increased vascularity and neoangiogenesis associated with neoplasms may facilitate localization of microfilariae within tumor tissue. Furthermore, the absence of peripheral microfilaremia in all cases and eosinophilia in the majority of patients underscores that normal hematological findings do not exclude occult filarial infection.

Generalizability

Although conducted at a single tertiary care center in an endemic region, the findings are likely applicable to other filariasis-endemic regions where FNAC is routinely performed for the evaluation of mass lesions and lymphadenopathy. The study emphasizes the importance of

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

maintaining a high index of suspicion for filariasis even in clinically unsuspected cases and may be relevant to both endemic and previously endemic settings undergoing elimination programmes.

Conclusion

Incidental detection of microfilariae on FNAC from clinically unsuspected sites remains an important diagnostic finding in endemic regions. Microfilariae may coexist with a broad spectrum of benign, inflammatory, and malignant lesions and frequently occur in the absence of peripheral microfilaremia or eosinophilia. Careful cytological examination allows early diagnosis, facilitates prompt treatment, and aids in the appropriate management of associated pathological conditions.

Limitations

The study has several limitations. First, the retrospective design limited the availability of complete clinical and laboratory information for all patients. Second, the relatively small sample size and single-center setting may restrict the generalizability of the findings. Third, confirmatory serological, antigen detection, or molecular diagnostic tests were not performed in all cases. Finally, treatment outcomes and long-term follow-up data were not available for evaluation.

Recommendations

Pathologists practicing in filariasis-endemic regions should routinely examine all cytology smears carefully for the presence of microfilariae irrespective of clinical suspicion or peripheral blood findings. Incidental identification of microfilariae should prompt appropriate clinical evaluation and timely antiparasitic therapy to prevent long-term complications of lymphatic filariasis.

Acknowledgements

The authors acknowledge the technical staff and laboratory personnel of the Department of Pathology, Patna Medical College and Hospital, Patna, Bihar, India, for their assistance in specimen processing, slide preparation, and retrieval of archival records used in this study.

List of Abbreviations

FNAC: Fine-Needle Aspiration Cytology
LF L: Lymphatic Filariasis
WHO: World Health Organization
GPELF: Global Programme to Eliminate Lymphatic Filariasis
MDA: Mass Drug Administration
DEC: Diethylcarbamazine
ABZ: Albendazole
IDA: Ivermectin, Diethylcarbamazine, and Albendazole
ICT: Immunochromatographic Test
FTS: Filariasis Test Strip
PCR: Polymerase Chain Reaction
HRUS: High-Resolution Ultrasound
FDS: Filarial Dance Sign
IHA: Indirect Haemagglutination Assay
SOL: Space Occupying Lesion
PAP: Papanicolaou stain
H&E: Hematoxylin and Eosin stain
MGG: May-Grünwald-Giemsa stain

Source of Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The authors declare that they have no conflict of interest related to this study.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author Contribution

Richa Bhartiya: Conceptualization, study design, manuscript review, and supervision
Pallavi Mehra: Data collection, data interpretation, manuscript drafting, and corresponding author responsibilities
Vishal Tayade: Cytological analysis, interpretation of findings, and manuscript review
Dipika Bongale: Data collection, literature review, and manuscript preparation
Manasi Karwa: Data acquisition, literature search, and manuscript editing
Navin Kumar Bariar: Study supervision, critical revision of the manuscript, and final approval

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

Author Biographies

Dr. Richa Bhartiya is Associate Professor in the Department of Pathology at Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, with research interests in cytopathology and diagnostic pathology.

Dr. Pallavi Mehra is Associate Professor in the Department of Pathology at Patna Medical College and Hospital, Patna, with special interest in cytopathology and hematopathology.

Dr. Vishal Tayade is Assistant Professor in the Department of Pathology at Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, with expertise in diagnostic pathology.

Dr. Dipika Bongale is Junior Resident in the Department of Pathology at Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai.

Dr. Manasi Karwa is Junior Resident in the Department of Pathology at Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai.

Dr. Navin Kumar Bariar is Professor and former Head of the Department of Pathology at Patna Medical College and Hospital, Patna, with extensive experience in academic pathology and medical education.

References

1. Progress Report 2000-2009 & Strategic Plan 2010-2020 of the Global Program to Eliminate Lymphatic Filariasis: Halfway Towards Eliminating Lymphatic Filariasis. 2011, France: WHO, Geneva, [http://whqlibdoc.who.int/publications/2010/9789241500722_eng.pdf]
2. Hussain MA, Sitha AK, Swain S, Kadam S, Pati S. Mass drug administration for lymphatic filariasis elimination in a coastal state of India: a study on barriers to coverage and compliance. Infect Dis Poverty. 2014 Sep 1;3:31. https://doi.org/10.1186/2049-9957-3-31
3. Mondal SK. Incidental detection of filaria in fine-needle aspirates: a cytologic study of 14 clinically unsuspected cases at different sites. Diagn Cytopathol. 2012 Apr;40(4):292-6 https://doi.org/10.1002/dc.21557
4. Yenkeshwar PN, Kumbhalkar DT, Bobhate SK. Microfilariae in fine needle aspirates: a report of 22 cases. Indian J Pathol Microbiol. 2006 Jul;49(3):365-9
5. Singh P, Anshu, Gangane N. Cytological diagnosis of filarial infection in an endemic area where screening and prophylaxis is in place. Cytopathology. 2012 Oct;23(5):325-9 https://doi.org/10.1111/j.1365-2303.2011.00890.x
6. Arora VK, Singh N, Bhatia A. Cytomorphologic profile of lymphatic filariasis. Acta Cytol. 1996 Sep-Oct;40(5):948-52 https://doi.org/10.1159/000334006
7. Lobos E, Ondo A, Ottesen EA, Nutman TB. Biochemical and immunologic characterization of a major IgE-inducing filarial antigen of Brugia malayi and implications for the pathogenesis of tropical pulmonary eosinophilia. J Immunol. 1992 Nov 1;149(9):3029-34. https://doi.org/10.4049/jimmunol.149.9.3029
8. Goyal P, Sehgal S, Ghosh S, Mittal D, Kumar A, Singh S. A cytological study of palpable superficial nodules of parasitic origin: a study of 41 cases. Patholog Res Int. 2014;2014:373472 https://doi.org/10.1155/2014/373472
9. Singh P, Chand N, Singal R, Madan M, Bala J. Filariasis presenting as multiple subcutaneous nodules: a rare case report. Acta Med Indones. 2011 Oct;43(4):249-51
10. Maheshwari V, Khan L, Mehdi G, Zafar U, Alam K.Microfilariae in thyroid aspiration smear-an unexpected finding. Diagn Cytopathol. 2008 Jan;36(1):40-1. https://doi.org/10.1002/dc.20549
11. Bhartiya R, Mallik M, Kumari N, Kumar M. Microfilaria in fine needle aspirate of thyroid nodule. Thyroid Research and Practice. 2016;13(2):86-88 https://doi.org/10.4103/0973-0354.183279
12. Fernandes H, Thomas BM, Putran I. Adult filarial worm from the breast aspirate of a young man. J Parasit Dis. 2016 Jun;40(2):536-8 https://doi.org/10.1007/s12639-014-0484-9
13. Chaudhuri T, Yadava K, Ray P. Microfilariasis of the breast mimicking malignancy. Indian J Med Paediatr Oncol. 2013 Jan;34(1):47 https://doi.org/10.4103/0971-5851.113433
14. Chakrabarti I, Das V, Halder B, Giri A. Adult filarial worm in the aspirate from a breast lump mimicking fibroadenosis. Trop Parasitol. 2011 Jul;1(2):129-31. https://doi.org/10.4103/2229-5070.86965

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

15. Katiyar S, Kumar A, Ranjan R, Tandon A. "Filarial Dance Sign" with Cytological Detection of Microfilaria: Our Experience over Two Years. International Journal of Scientific Study 2015;3:35-39
16. Gupta S, Gupta R, Bansal B, Singh S, Gupta K, Kudesia M. Significance of incidental detection of filariasis on aspiration smears: a case series. Diagn Cytopathol. 2010 Jul;38(7):517-20. https://doi.org/10.1002/dc.21264
17. Kumar B, Karki S, Yadava SK. Role of fine needle aspiration cytology in diagnosis of filarial infestation. Diagn Cytopathol. 2011 Jan;39(1):8-12. https://doi.org/10.1002/dc.21314
18. Jain S, Sodhani P, Gupta S, Sakhuja P, Kumar N. Cytomorphology of filariasis revisited: Expansion of the morphological spectrum and coexistence with other lesions. Acta Cytol 2001;45:186-191 https://doi.org/10.1159/000327275
19. Agrawal P, Kumar S, Garg N, Kumar R. Incidental Filariasis in Abdominal neoplasm: Cytodiagnosis of two cases with a review of literature. Ann Path Lab Med 2016;3: 16-18
20. Agrawal R, Khanna D, Barthwal SP. Microfilaria in association with neoplastic lesion. Report of 5 cases. Cytopathology 2001;12:120-126 https://doi.org/10.1046/j.1365-2303.2001.00301.x
21. Mohan S, Andley M, Ravi R, Kumar A. An unusual association with carcinoma pancreas: A case report. Cytopathology 2005;16:215-216 https://doi.org/10.1111/j.1365-2303.2005.00205.x
22. Arkari SU, Yelikar BR. Microfilariae in cytological smears of hepatocellular carcinoma. J Cytol 2007;24:158-159. https://doi.org/10.4103/0970-9371.41912
23. Wilson M, Schantz PM, Nutman T. Molecular and immunological approaches to the diagnosis of parasitic infections. In: Detrick B, Hamilton RG, Folds JD, editors. Manual of molecular and clinical laboratory immunology. 7th ed. Washington DC: ASM Press. 557-568 https://doi.org/10.1128/9781555815905.ch65
24. Rahman RA, Cheah HH, Rahman N. Pan LF ELISA using BmR1 and BmSXP recombinant antigens for detection of lymphatic filariasis. Filaria J 2007;10:6 https://doi.org/10.1186/1475-2883-6-10
25. Sahoo PK, Satapathy AK, Michael E, Ravindran B. Short report: Concomitant parasitism: Bancroftian filariasis and intestinal helminths and response to albendazole. Am J Trop Med Hyg 2005;73:877-880 https://doi.org/10.4269/ajtmh.2005.73.877
26. World Health Organization. Global programme to eliminate lymphatic filariasis: progress report, 2024. Wkly Epidemiol Rec 2025;100(40):439-450.
27. NTD Modelling Consortium Lymphatic Filariasis Group. The roadmap towards elimination of lymphatic filariasis by 2030: insights from quantitative and mathematical modelling. Gates Open Res 2019;3:1538. https://doi.org/10.12688/gatesopenres.13065.1
28. Jabir M, Rahi M. Global insights can accelerate India's journey towards the elimination of lymphatic filariasis as a public health problem. BMJ Glob Health 2025;10(7):e018851. https://doi.org/10.1136/bmjgh-2025-018851
29. Tripathi B, Roy N, Dhingra N. Introduction of triple-drug therapy for accelerating lymphatic filariasis elimination in India: lessons learned. Am J Trop Med Hyg 2022;106(5 Suppl):29-38. https://doi.org/10.4269/ajtmh.21-0964
30. Gupta D, Gupta P, Jain S, Rahar S. Cytological diagnosis of microfilariae in clinically unsuspected cases: a retrospective review of 12 cases. Cytopathology 2021;32(6):807-812. https://doi.org/10.1111/cyt.13035
31. Singh N, Agrawal S, Saha S. Double trouble in the thyroid: coexistence of Hürthle cell neoplasm and microfilarial infestation. Discoveries (Craiova) 2025;13(3):e215. https://doi.org/10.15190/d.2025.14
32. Sharma S, Kala PS, Malviya A, Lakhani A, Chandra N. Incidental diagnosis of subcutaneous filariasis with an unusual presentation in a non-endemic area - need to worry? J Family Med Prim Care 2024;13(11):5370-5373. https://doi.org/10.4103/jfmpc.jfmpc_533_24
33. Pathak B, Maimoon S. Incidental finding of microfilaria in lymph node cytology: a case report. Cureus 2022;14(11):e31275. https://doi.org/10.7759/cureus.31275
34. Gupta D, Gupta P, Bhardwaj M. Fine-needle aspiration of axillary swelling: cytodiagnosis of an

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2805
Original Article

unusual presentation of filariasis. CytoJournal 2019;16:25. https://doi.org/10.4103/cytojournal.cytojournal_17_19

PUBLISHER DETAILS:

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa