CASE REPORT

Role of fine needle aspiration cytology in diagnosing filarial arm cysts

Nishi Tandon,¹ Cherry Bansal,² Richa Sharma,¹ Sumaiya Irfan¹

¹Department of Pathology, Era Medical College and Hospital, Lucknow, Uttar Pradesh, India
²Department of Pathology, CSMMU, Lucknow, Uttar Pradesh, India

Correspondence to
 Dr Cherry Bansal,
 drcherrybansal@gmail.com

SUMMARY

Filariasis is prevalent in tropical and subtropical areas and is endemic in regions of India. Lymphatic filariasis in India is caused mainly by two species of nematodes: *Wuchereria bancrofti* and *Brugia malayi*, which invade the human lymphatic system. We report two cases of superficial cystic lesions of the upper limb revealed on fine needle aspiration (FNA) to be clinically unsuspected filariasis. Despite similar aetiologies, both cases revealed variations in aspirate nature, smear morphology and peripheral blood findings. FNA provides definitive diagnosis and is an important tool for diagnosing soft tissue swellings owing to filariasis.

BACKGROUND

Filariasis has wide distribution in the tropical and subtropical regions and is endemic in India, China, Indonesia, parts of Asia and Africa. Two closely related nematode worms, *Wuchereria bancrofti* and *Brugia malayi* mainly cause filariasis in the Asian subcontinent. South Asian Bancroftian filariasis is transmitted by the *Culex* mosquito while Brugian infections are transmitted by *Mansonia* species.^{1 2} The adult filarial worms reside in the lymphatic system from where the gravid female releases large number of microfilaria which may pass through the thoracic duct and pulmonary capillaries into the peripheral blood and occasionally microfilaraemia may be found in the infected patient. Most frequently, the lymphatic system of the lower limbs, retroperitoneal tissues, spermatic cord, epididymis and mammary glands is involved.^{3–5}

We encountered two unusual cases of filarial infestation as solitary cystic swelling of arm subcutaneous tissue. Exact incidence of microfilaria presenting as upper arm cystic swelling is not known but filarial cystic swelling in the upper arm is very rare.^{5 6} We are reporting these cases to highlight the definitive role of simple, cost-effective fine needle aspiration (FNA) technique for microfilaria detection in filariasis endemic regions.

CASE PRESENTATION

Case 1

A 35-year-old woman, resident of Behraich (Uttar Pradesh) presented with a painless, arm soft tissue swelling gradually increasing over a period of 2 months. She had no other systemic complaints. Examination revealed a solitary, non-tender, mobile, soft cystic swelling measuring 1.5×1.5 cm on ventral surface of the left arm. There was no axillary lymphadenopathy.

Case 2

A 38-year-old man, resident of Lucknow (Uttar Pradesh) had painful swelling in left arm with a 1 month history of low-grade, off and on fever. Examination revealed a non-mobile, tender, firm swelling measuring 2×0.5 cm arising from a cord like structure on the medial side of upper left arm. No evidence of lymphadenopathy was present.

INVESTIGATIONS

Case 1

FNA (21G) from the arm swelling yielded aspirate of 0.3 ml clear fluid. Swelling shrunk in size following aspiration. H&E stained smears revealed curved microfilarial sheaths and occasional eosinophils, lymphocytes against proteinaceous background (figure 1). Peripheral blood smear did not show microfilariae or eosinophilia.

Case 2

White chylous fluid was aspirated. FNA smears showed a mixed inflammatory infiltrate comprising eosinophils, neutrophils and a few histiocytes along with foreign body giant cells. Numerous microfilariae of *W bancrofti* with characteristic cytomorphology of sheathed larvae with tail-tip free from nuclei were identified (figures 2 and 3). At the time of aspiration, chylous fluid had raised suspicion for parasitic lymphatic involvement and the wet smear prepared showed actively motile larvae. Peripheral blood smear showed eosinophilia with absolute eosinophil count of $0.98 \times 10^9/l$ (reference range 0.04–0.44×10⁹/l). No microfilariae were seen on the blood film.

Figure 1 Photomicrograph from case 1 showing slightly curved sheath of microfilaria with an eosinophil and lymphocyte on proteinaceous background (H&E ×400).

To cite: Tandon N, Bansal C, Sharma R, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009677

Figure 2 Scanner view from case 2 showing tangled microfilariae with dense mixed inflammatory infiltrate (H&E ×100).

DISCUSSION

Lymphatic vessels of the definitive host (man) harbour the adult worms of *W bancrofti* and *B malayi* and microfilariae are released in the peripheral blood. Majority of filarial infections are asymptomatic in endemic areas like eastern part of Uttar Pradesh; although the disease can manifest as asymptomatic microfilariemia, acute lymphangitis and lymphadenitis, chronic lymphadenitis, oedema of limbs and tropical pulmonary eosinophilia.^{7–10} The clinical picture in the present cases did not give any clue regarding the aetiology.

Microfilariae have been reported at various sites like epididymis,¹¹ breast,¹² urine,¹³ thyroid,¹⁴ ovarian fluid,¹⁵ bone marrow¹⁶ and upper arm cystic swelling.⁵ Cases often present with lymphatic system involvement, but the extralymphatic compartment can also get involved. Extravasation may explain the presence of microfilariae in pericardial fluid, breast cyst fluid and bronchial aspirate. The parasites circulate in lymphatic and vascular compartments but the presence of filarial organism in tissue fluids and exfoliated surface material probably occurs owing to conditions causing lymphovascular obstruction resulting in extravasations of blood and release of microfilariae.^{17, 18} Such aberrant migration to these dead end sites is probably determined by local factors, such as lymphatic blockage by scars or tumours and damage to the vessel wall by inflammation,

Figure 3 Photomicrograph from case 2 showing microfilaria of *Wuchereria bancrofti* with characteristic cytomorphology of sheathed larvae with tail-tip free from nuclei. Mixed inflammatory infiltrate composed of eosinophils and neutrophils is seen in the background. (H&E ×400).

trauma or stasis. Our patients were asymptomatic amicrofilariemic carriers residing in filariasis endemic region of North India. Rupture of vessels may have led to release of microfilariae into the subcutaneous tissue. Surrounding host tissue reaction probably led to the development of a well-defined cystic swelling containing multiple microfilariae. Filariasis rarely presents as cystic swelling.^{5, 6, 9, 17, 18} Eosinophilia resulting from filariasis may be attributed erroneously to coexistent pathologies.¹⁶

The difference in the swelling type (nodular vs thickened cord like) and nature of aspirates (clear vs chylous) could be owing to extravasation in the first case. Findings of the two cases also varied with respect to peripheral eosinophilia and FNA smear, that is, microfilarial morphology and the associated inflammatory response. Peripheral blood smear examination is a useful but relatively less sensitive tool to diagnose filariasis. Eosinophilia, although relatively common, is non-specific and, as in case 2, is not invariable.^{3, 4, 10} Cellular background of granulocytes and giant cells in the second case versus clean background of the first case may be the result of host tissue response owing to lymphatics involved. The cytology of the filarial infestation can reveal microfilaria with or without adult worms and associated eosinophils, neutrophils and mononuclear cells.^{12, 13, 17–19} Our cases did not have the presence of either ova or adult worm in aspirates. Our report of clinically unsuspected filariasis supplements prior literature on unusual presentations of this parasite and reminds the tropical pathologist to maintain a high index of suspicion for unusual infections at uncommon sites.²⁰

Learning points

- ▶ Filariasis may present as cystic lesions in unusual sites without associated lymphatic involvement in the form of lymphangitis and lymphadenitis.
- ▶ Fine needle aspiration represents a minimally invasive, cost-effective and definitive diagnostic modality for diagnosis of filarial soft tissue swellings.
- ▶ The type of aspirate and the cytological findings including the nature of the inflammatory response are variable and may depend on location of the parasite (lymphatic vs extralymphatic), local trauma, lymphatic obstruction and stasis.

Contributors All the authors have contributed significantly and fulfil the criteria for authorship.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Jain S, Sodhani P, Gupta S, et al. Cytomorphology of filariasis revisited. Expansion of the morphologic spectrum and coexistence with other lesions. *Acta Cytol* 2001;45:186–91.
- 2 Wagla N, Patel MM, Pandya AN, et al. Microfilariae in cytology smears: real culprits or trapped accidentally by needles? A study of 10 cases. *Cytopathology* 2005;16:315–20.
- 3 Chatterjee KD. Phylum nemathelminthes. In: Chatterjee KD, ed. *Parasitology in relation to clinical medicine*. 12th edn. Calcutta, India: Chatterjee Medical Publishers, 1980:190–8.
- 4 Park JE, Park K. *Park's textbook of preventive and social medicine*. 18th edn. Jabalpur, India: Banarasidas Bhanot, 2002:211–16.

- 5 Pahwa R, Arora VM. Microfilaria in cytology smears from upper arm swelling. *J Cytol* 2011;27:155.
- 6 Dey P, Walker R. Fine needle aspiration cytology of microfilaria in skin nodule. *Acta Cytol* 1994;38:114.
- 7 Sah SP, Rani S, Mahato R. Microfilaria in lymph node aspirate. *Acta Cytol* 2002;46:73–5.
- 8 Yenkeswar PN, Kumbhalkar DT, Bobhate SK. Microfilariae in fine needle aspirate: a report of 22 cases. *Indian J Pathol Microbiol* 2006;49:365–9.
- 9 Garbyal RS, Arundhati, Bohra A, et al. An unusual presentation of filariasis: a case report. *Acta Cytol* 2008;52:204–6.
- 10 Mcadam AJ, Sharpe HA. Infectious diseases. In: Kumar V, Abbas AK, Fausto N, eds. *Robbins and Cotran pathologic basis of disease*. 7th edn. Philadelphia, PA: Saunders, 2004:343–414.
- 11 Jayaram G. Microfilaria in fine needle aspiration aspirates from epididymal lesions. *Acta Cytol* 1987;31:59–61.
- 12 Kapila K, Verma K. Diagnosis of parasites in fine needle breast aspirates. *Acta Cytol* 1996;40:653–6.
- 13 Seth A. Microfilaruria in a patient of intermittent chyluria. *J Cytol* 2009; 26:151–2.
- 14 Mehrotra R, Lahiri VL, Hazara DK. Microfilariae identified in FNA of a thyroid nodule. *Diagn Cytopathol* 1997;16:149–50.
- 15 Varghese R, Raghuvver CV, Pai MR, et al. Microfilariae in cytologic smears: a report of six cases. *Acta Cytol* 1996;40:299–301.
- 16 Sharma P, Tyagi S. An unusual cause of eosinophilia in AML-M4 without the Inv (16) abnormality. *J Blood Disord Transfus* 2010;1:104.
- 17 Walter A, Krishnaswami H, Cariappa A. Microfilaria of Wuchereria bancrofti in cytologic smears. *Acta Cytol* 1983;27:432–6.
- 18 Gupta K, Sehgal A, Puri MM, et al. Microfilariae in association with other diseases. A report of six cases. *Acta Cytol* 2002;46:776–8.
- 19 Sinha BK, Choudhary M. Microfilaria in peritoneal fluid from an amicrofilaremic, pregnant woman. *Acta Cytol* 2001;45:898–9.
- 20 Sharma P, Kumar N, Jain P, et al. Chronic wuchereriosis presenting as a vaginoperineal fistula: report of a case with aspiration cytologic diagnosis. *Acta Cytol* 2005;49:335–8.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit

<http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow