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CASE STUDY

Asymptomatic lymphatic filariasis in an elderly patient from Bako, Sarawak: A case report and public health implications

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ABSTRACT

Lymphatic filariasis (LF) remains a significant public health challenge in many tropical regions where the disease is endemic. In Malaysia, LF is found in small pockets across the country. Asymptomatic carriers play a critical role in transmission but are often undetected. This report details an investigation of an asymptomatic filariasis reported by local health authorities involving an 83-year-old female patient residing in the Bako area, Sarawak. Despite being immobile due to a stroke, routine screening identified an infection with *Brugia malayi* through microscopy and a rapid diagnostic test. Interestingly, the patient exhibited no acute or chronic symptoms typically associated with filariasis. Contact tracing among her family members revealed that her son was also infected. Both patients received treatment with diethylcarbamazine (DEC) at a dosage of 6 mg/kg, along with albendazole 400 mg and ivermectin 12 mg. Preventive measures included health education, entomological studies, and the implementation of a 'Test & Treat Filariasis' program in the village. By documenting both the index case and a secondary asymptomatic case within the same household, the study provides a strong example of how routine screening and contact tracing can identify hidden sources of infection. This adds significant value to LF elimination strategies and emphasizes the importance of community-level surveillance programs. Coordinated efforts by health authorities, including contact tracing, environmental assessments, and targeted treatment, are essential for controlling the spread of LF and safeguarding public health.

Keywords: Elephantiasis; mosquito-borne disease; endemic; Borneo Malaysia.

INTRODUCTION

Lymphatic filariasis (LF), also known as elephantiasis, is a group of neglected tropical diseases (NTDs) that affect tropical and subtropical regions worldwide. It is caused by parasitic worms, *Wuchereria bancrofti* and *Brugia malayi*. It is transmitted by various types of mosquito species, including *Mansonia*, *Culex*, *Anopheles*, and *Aedes* (Vythilingam, 2012; Kaikuntod *et al*., 2020). The clinical signs of LF can vary widely. LF leads to chronic conditions such as lymphoedema, hydrocele, and elephantiasis, causing lifelong disability and often resulting in social stigma. These conditions profoundly impact the daily lives of those affected, diminishing their quality of life (WHO, 2023). While many are asymptomatic carriers, symptomatic cases develop painful swelling, long-term lymphatic dysfunction, and disfigurement (WHO, 2023). The gold standard for diagnosing LF is the detection of microfilariae in a blood smear through microscopy, with additional methods, such as rapid immunochromatography assays, also being used.

The World Health Organization (WHO) estimates that more than 120 million people worldwide are infected with LF, with approximately 40 million experiencing debilitating or disfiguring symptoms (WHO, 2023). In Southeast Asia, including Malaysia, LF remains endemic in certain areas, although the overall prevalence is relatively low, and extensive control measures are in place (Yajima & Ichimori, 2020). Malaysia has made significant progress in reducing LF prevalence through the Global Programme to Eliminate Lymphatic Filariasis (GPELF). This program includes mass drug administration (MDA), vector control, and morbidity management. Nationwide, MDA campaigns have been conducted in endemic areas, resulting in a notable decline in prevalence rates (MoH, 2023). According

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to a report from the Ministry of Health, Malaysia, by 2022, it had achieved the target of maintaining infection prevalence below 2% in 125 endemic subdistricts (MoH, 2023).

Despite these efforts, the disease continues to persist in some pockets in Malaysia due to several factors, including environmental conditions, socioeconomic disparities, and barriers to healthcare access, particularly among vulnerable groups such as migrants and rural communities. Sporadic cases are still being reported, particularly in regions such as Sabah and Sarawak, where they are more prevalent among rural populations (Nurul-Ain *et al*., 2019). *B. malayi*, the leading cause of LF in Malaysia, is endemic to parts of Asia, including Indonesia, India, Bangladesh, and Sri Lanka, where environmental conditions and the presence of the vector facilitate its transmission (Bizhani *et al*., 2021). The influx of migrants from these endemic countries poses a heightened risk as carriers, facilitating ongoing transmission and hindering efforts to eliminate the disease (Abdul Halim et al., 2025). Contributing factors to ongoing transmission include incomplete coverage of preventive programs, limited public awareness, ecological factors, and zoonotic reservoirs, which also help sustain the transmission cycle (Ahmad *et al*., 2018; Abdul Halim *et al*., 2025).

The continued presence of LF in Malaysia underscores the importance of robust disease surveillance, timely diagnosis, and ongoing research to guide effective public health strategies. This report presents a case of asymptomatic LF in an elderly woman, highlighting the need for continued surveillance and preventive strategies in endemic areas. In addition, it highlights the complex dynamics of the disease in endemic areas, particularly concerning the environmental, social, and biological factors that contribute to its transmission. Implementing preventive measures, including health education and vector control, is crucial for preventing further transmission and reducing the public health burden of LF in Sarawak and other regions.

CASE REPORT

This report presents a case investigation of filariasis involving an 83-year-old woman residing in Bako, Kuching Division, Sarawak. Informed written consent was obtained for publication, and all identifiable information was withheld to protect confidentiality. She had a history of a stroke that left her immobile and homebound. Previously, she was actively engaged in farming activities near her residence. This case was detected during routine screening conducted by the Kuching District Health Office. A thick blood slide smear stained with Giemsa and examined microscopically revealed *Brugia malayi*, with a density of 55 microfilariae per 60 microliters of blood (Figure 1). The infection was confirmed with a *Brugia* Rapid Test Kit (BRTK) (Figure 2). Interestingly, the patient remained asymptomatic with no acute or chronic clinical manifestation of LF (Figure 3). Following the diagnosis, an extensive household contact tracing exercise was conducted. Six family members were screened, and one contact, the patient's 56-year-old son, tested positive for filariasis via the BRTK. The results of the night blood survey for her son were also positive for *B. malayi*. Environmental assessments revealed that the patient's home is surrounded by family-owned farmland, which provides a suitable breeding ground for mosquitoes. During an active control program, the Vector Unit detected microfilaria in the Mansonia mosquito from the same location. In response to these findings, several preventive measures were implemented. Health education sessions were conducted, and the Kuching District Health Office planned an entomological study to assess the vector population in the area. Additional intervention, including the 'Test & Treat Filariasis' program and night blood surveys within a 1-kilometer radius of the patient's home, was carried out to manage other potential cases in the community. Both patient and her son were prescribed a triple drug regimen consisting of diethylcarbamazine (DEC) at 6 mg/kg, albendazole 400 mg, and ivermectin 12 mg in line with the recommended treatment guidelines.

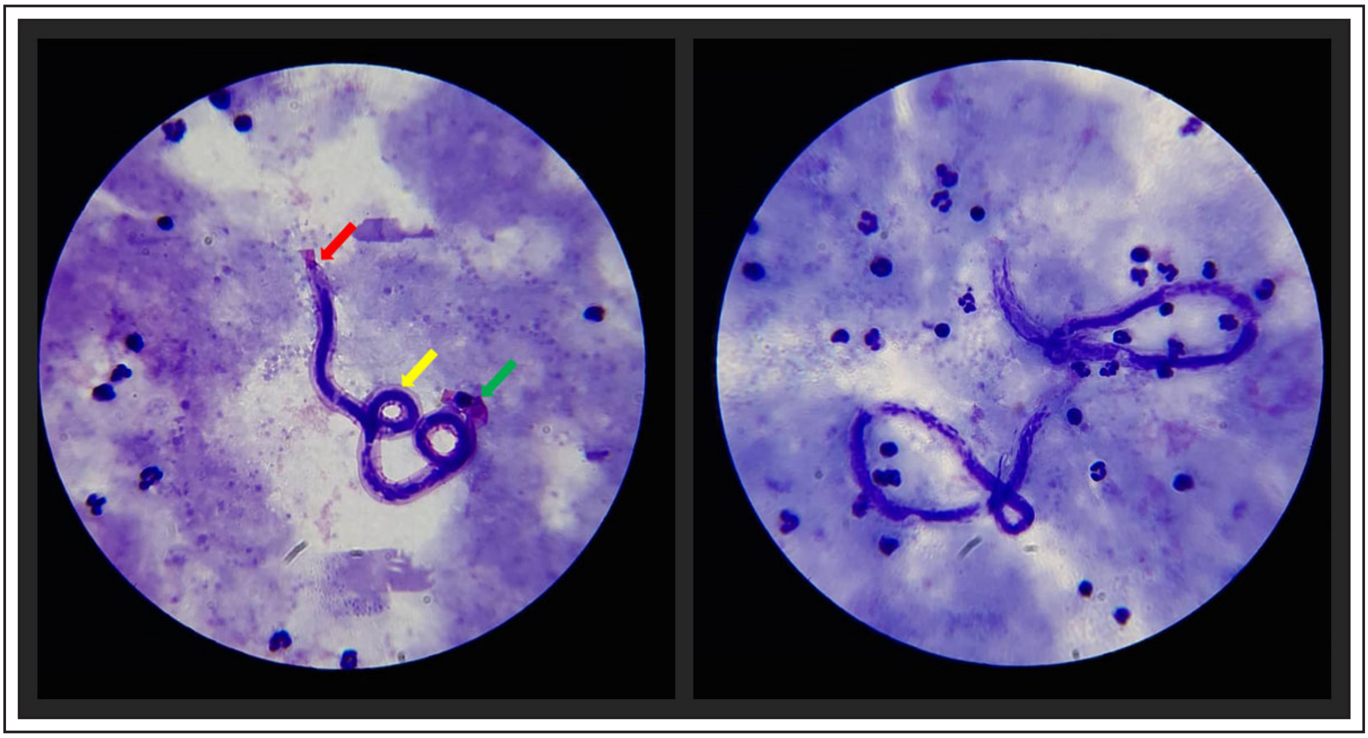

Figure 1. Microscopy results of thick blood smears reveal the microfilaria of *B. malayi*, which are stained with Giemsa (40x magnification). The microfilaria are slender and exhibit a distinct curved shape, often with a sharply bent (or coiled) tail. The cephalic region has a characteristic length-to-width ratio of approximately 2:1 (red arrow). The microfilaria are sheathed (green arrow) and feature indiscrete (dense) body nuclei (yellow arrow).

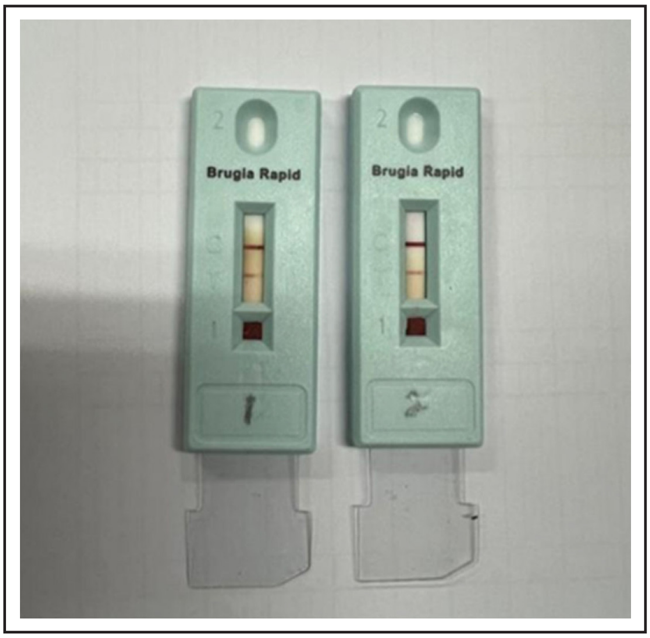

Figure 2. The rapid Brugia test reveals a positive band for the patient and her son.

Figure 3. The patient with a history of stroke and limited mobility. She shows no clinical manifestations of LF.

DISCUSSION

This case study highlights an elderly patient diagnosed with asymptomatic LF. Despite lacking typical manifestations of LF, she tested positive for *B. malayi* during a routine screening program. Her diagnosis was confirmed with the detection of microfilaria by microscopic examination and a rapid kit test. Contact tracing further identified her 56-year-old son as another asymptomatic carrier. The patient, confined to immobility due to a stroke, highlights significant public health challenges linked to the combination of chronic health conditions, socio-economic factors, and environmental elements that may increase the risk of LF exposure. This report differs from previously documented cases of asymptomatic infection and offers important insights for public health strategies to manage and prevent LF. While asymptomatic LF is common, its occurrence in an elderly individual with severe comorbidities like post-stroke immobility introduces complexities that have not been thoroughly explored in the existing literature. Likewise, the finding emphasizes the role of silent carriers in sustaining LF, especially within households.

Early detection and treatment are critical for reducing LF incidence and preventing complications (Bizhani *et al*., 2021). In response to this case, the Kuching District Health Office implemented several control measures, including health education and entomological studies. The 'Test & Treat Filariasis' program and night blood surveys conducted within a 1-kilometer radius of the patient's home were essential interventions for controlling disease spread. Treatment with diethylcarbamazine (DEC), albendazole, and ivermectin aligns with the standard management of LF in endemic areas (Macfarlane *et al*., 2019). These drugs synergistically reduce the microfilarial load and halt disease progression. The planned entomological study by the Kuching District Health Office is also crucial for understanding the distribution and density of mosquito vectors.

Lymphatic filariasis (LF) is characterized by the presence of microfilariae in the blood and is often associated with complications (WHO, 2023). However, atypical presentation has been reported in Thailand involving a patient with periorbital filariasis caused by *B. malayi* (Nunthanid *et al*., 2020). The patient exhibited no evident clinical symptoms of LF despite confirmed infections. Such an atypical presentation challenges the conventional understanding of LF, which is usually associated with progressive and debilitating symptoms. Studies have suggested that up to 50% of individuals infected with *B. malayi* are asymptomatic (Bizhani *et al*., 2021), as observed in this report. These asymptomatic cases are often identified during routine screening programs. This highlights the importance of active surveillance and screening in areas with a high burden of LF. The patient's mobility was limited after her stroke, limiting her exposure. However, the location of her residence, surrounded by family-owned farmland, likely provided a suitable environment for mosquito breeding. This allowed the persistent presence of vectors. The agricultural landscape surrounding the patient's home, including stagnant water in palm oil plantations, irrigation ditches, and ponds, is known to support mosquito breeding, including *Mansonia*, the primary vector of *B. malayi* (Ahmad *et al*., 2018). This is evident with the identification of microfilaria of *B. malayi* in the collected Mansonia during the Kuching District Health Office control program exercise. This highlights the need for active surveillance programs in endemic regions to reduce the number of vector breeding sites and limit transmission risk.

The patient's son, also found to be an asymptomatic carrier, exemplifies the potential for household transmission. This suggests shared environmental exposures and proximity to living facilitate household spread. The successful detection of the son through contact tracing demonstrates the importance of community-based surveillance and early detection in controlling the spread of filariasis. Silent carriers play a pivotal role in the persistence of LF in endemic areas (Ottesen *et al*., 2008). These individuals harbor microfilaria at night, the prime time for transmission by mosquito vectors such as Mansonia. They often remain undetectable in standard surveillance programs, undermining the global elimination effort, such as the WHO GPELF. This presents a considerable challenge for LF control, as their existence can sustain the transmission cycle without visible signs of illness.

Mass drug elimination (MDA) aims to reduce community-level microfilarial density. However, asymptomatic carriers increase the risk of reinfection or persistent transmission (Njenga *et al*., 2011). One possible reason is community compliance with MDA. Studies consistently demonstrate that suboptimal compliance hampers the effectiveness of MDA programs. For instance, a study in Indonesia found that individuals with greater awareness of LF were more likely to adhere to treatment, underscoring the importance of enhancing community awareness for better participation (Ratna *et al*., 2024). Likewise, the study has identified misconceptions about the disease, fears regarding side effects, and mistrust towards drug distributors as significant barriers to adherence (Ratna *et al*., 2024). Moreover, diagnostic challenges associated with low-density infections exacerbate this problem. Existing diagnostic technologies often fail to detect asymptomatic or low-density infected individuals, leaving numerous transmission links unrecognized (Teshome *et* *al*., 2021). Although promising advancements in xenomonitoring exist, they have yet to be widely implemented (Pi-Bansa *et al*., 2019). Inadequate diagnostic capabilities may foster complacency in monitoring efforts and hinder the detection of asymptomatic disease spread.

Another factor compounding this issue is the zoonotic reservoirs that sustain LF transmission. The ecological transformation of Southeast Asia, particularly through urbanization, has intensified the challenge of zoonotic filariasis. Urban conditions foster vector proliferation, while agricultural expansion increases human proximity to animal reservoirs. Crucially, these reservoirs are primarily comprised of domestic animals, such as cats and dogs, which are key sources of *B. malayi* and emerging zoonotic strains, including *Brugia pahangi* (Pi-Bansa *et al*., 2019; Intarapuk & Bhumiratana, 2021; Bhumiratana *et al*., 2023). The transmission cycle is further complicated by the diversity of competent mosquito vectors (Vythilingam, 2012; Kaikuntod *et al*., 2020). This reservoir dynamic presents a significant obstacle to elimination, as MDA targeting humans alone may be undermined by ongoing transmission from animals, potentially leading to a resurgence of cases, including asymptomatic cases (Pi-Bansa *et al*., 2019).

Additionally, socioeconomic factors play a critical role as risk determinants for zoonotic transmission of Brugia species. Close contact between humans and potential animal reservoirs, such as when keeping domestic animals, increases the risk of infection. Studies have reported increasing seroprevalence to Brugia species among individuals who frequently interact with domestic animals, underscoring the need for a One Health approach (Intarapuk & Bhumiratana, 2021). While effective public health strategies have been implemented, the ongoing prevalence of zoonotic diseases highlights the necessity for continuous surveillance. Factors such as climate change and altered land-use patterns are expected to exacerbate transmission dynamics of Brugia species. Addressing this issue will require a multidisciplinary strategy that fosters collaboration between veterinarians and public health professionals to mitigate the risk of zoonotic transmission of Brugia species across endemic regions, particularly Southeast Asia (Bhumiratana *et al*., 2023).

CONCLUSION

This case underscores the dual challenge of asymptomatic LF and household transmission in endemic areas, highlighting a concealed disease burden among vulnerable, less mobile populations. For global elimination efforts to succeed, public health strategies must directly address these silent carriers. This requires enhanced, integrated interventions that combine active surveillance and targeted control for high-risk groups with effective treatment, health education, and vector control assessments.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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