Filariasis In The Arm – A Diagnostic Enigma!

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Abstract

Lymphatic filariasis is a disease of the tropics. It is caused by infection with any of several round, thread-like parasitic worms. This most commonly occurs due to infection with a parasite that lives in the lymph system. This is called lymphatic filariasis. The parasite is spread from person to person by infected mosquitoes. Long-term exposure and repeated infections can cause severe damage to the lymph system and serious, debilitating complications. Prevention centers on controlling mosquito populations in communities and avoiding mosquito bites. Filariasis is caused by three types of parasitic worms: Wuchereria bancrofti, Brugia malayi and Brugia timori. We report a case of lymphatic filariasis in the right arm, in a young 22-year-old male. This was treated by excision of the dilated lymphatic vessel which revealed the presence of live worms.

INTRODUCTION

Filariasis is a major public health problem in India despite the existence of the National Filaria Control Programme. Filariasis is very frequently encountered in the Asian, African and some of the South American countries, that is in the tropics. The disease was recorded in India as early as in the 6th century B.C. by the famous Indian physician Susruta in his book 'Susruta Samhita'[1]. The National Filaria Control Programme (NFCP) was launched in the country in 1955 with the objective of delimiting the problem and to undertake control measures in endemic areas. The manifold increase in filariasis during the last six decades reflects the failure of filariasis control programs. The global initiatives to eliminate lymphatic filariasis as a public health problem by the year 2020 have generated a great deal of debate in India, the largest endemic country. This has led to a shift in the focus from control to elimination of the disease.

CASE REPORT

We report a case of a 22-year-old male patient presenting with a linear swelling in the long axis of the anterior aspect of the right arm. The swelling was 5cm long and 0.5cm broad. It was present in the subcutaneous tissue above the deep fascia, and the overlying skin could be pinched away from the swelling. The patient complained of mild discomfort, and there was no tenderness. It had been present for the previous six months and had been gradually increasing in size. There were no axillary lymph nodes, nor was there any edema of the distal limb.

Laboratory investigation did not reveal anything, the peripheral blood smear revealing no eosinophilia or hemoparasite. A soft-tissue ultrasound of the right arm showed a linear structure in the subcutaneous tissue, with similar dimensions as described in the clinical findings. FNAC did not reveal anything significant.

The patient was posted for surgery which was done under a supraclavicular block. The linear swelling, which appeared like a dilated lymphatic, was dissected and excised completely (Figures 1 and 2). On opening the excised specimen, we were surprised to see multiple thread-like worms, which were moving (Figure 3). It was now that we had diagnosed the case as a dilated lymphatic that contained thread-like live worms, as a case of filariasis.

Histology confirmed our suspicion.

Figure 1

Fig. 1. Dilated lymphatic duct being dissected

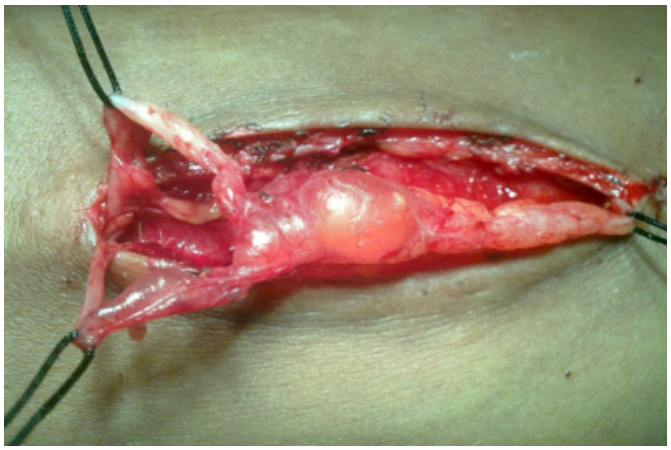


Figure 2

Fig. 2. Dissected lymphatic duct

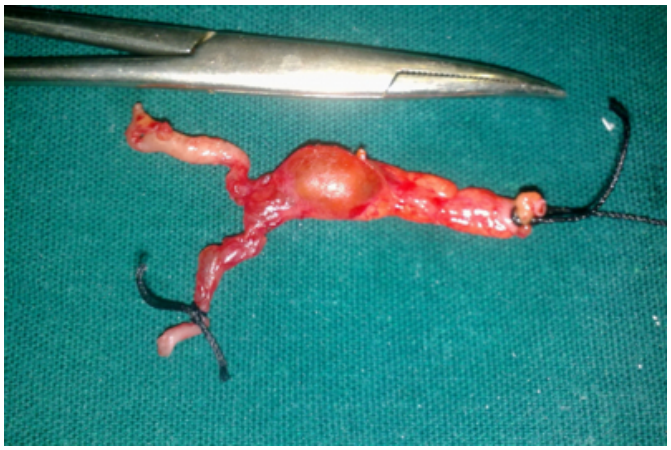
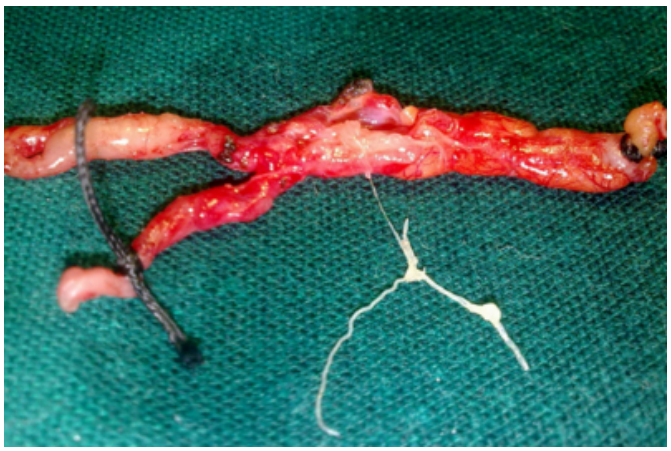


Figure 3

Fig. 3. Live worm extracted from the duct which was actually moving



DISCUSSION

Lymphatic filariasis, more commonly known as elephantiasis, is a painful and profoundly disfiguring disease. While the infection is usually acquired in childhood its visible manifestations occur later in life, leading to temporary and permanent disability. Lymphatic filariasis has a major social and economic impact on endemic countries. The disease is caused by three species of nematode thread-like worms – Wuchereria bancrofti, Brugia malayi and Brugia timori, known as filariae. Male worms measure about 3-4cm in length and female worms between 8-10cm. Both male and female worms live together and form 'nests' in the human lymphatic system, the network of nodes and vessels that maintain the delicate fluid balance between the tissues and blood. The lymphatic system is an essential component of the body's immune system. Filariae are responsible for a variety of clinical manifestations, including lymphoedema of the limbs, genital disease (hydrocele, chylocele and swelling of the scrotum and penis) and recurrent acute disease episodes. The vast majority of infected people are asymptomatic but virtually all of them have subclinical lymphatic damage and as many as 40% have renal involvement with proteinuria and haematuria. Filariae are transmitted through mosquitoes. When a mosquito with infective-stage larvae takes a blood meal, the parasites are deposited on the person's skin from where they enter through the skin. These larvae then migrate to the lymphatic vessels and develop into adult worms, over a period of 6 to 12 months, causing damage to and dilatation of the lymphatic vessels. The adult filariae live for several years in the human host. During this period they produce millions of immature microfilariae that circulate in the peripheral blood and are ingested by mosquitoes when the latter bite infected humans. The larval forms further develop inside the mosquito before becoming infectious to man. Thus, a cycle of transmission is established. Symptoms can appear 5-18 months after a mosquito bite.

A large majority of the cases found in India are attributed to infection by Wuchereria bancrofti which mainly affects the lymph nodes and the lymphatic channels.[2] Considerable progress has been made in diagnosis and treatment of filariasis in the last decade and new strategy for filariasis elimination aims at transmission control through mass drug administration (MDA) and at disease control through individual patient management. Until recently, diagnosis of filarial infection depended on the direct demonstration of the parasite (almost always microfilariae) in blood or skin specimens using relatively cumbersome techniques and having to take into account the periodicity (nocturnal or diurnal) of microfilariae in blood. Circulating filarial antigen

(CFA) detection test is now regarded as the 'gold standard' for diagnosing Wuchereria bancrofti infections. The specificity of these assays is near complete, and the sensitivity is greater than that achievable by the earlier parasite detection assays. Two commercial configurations of this assay are available, one based on enzyme-linked immunosorbent assay (ELISA) methodology that yields semi-quantitative results, and the other based on a simple immunochromatographic card test, yielding only qualitative (positive/negative) answers.[3] The state of Bihar has the highest endemicity (over 17%) followed by Kerala (15.7%) and Uttar Pradesh (14.6%). Andhra Pradesh and Tamil Nadu have about 10% endemicity. Goa showed the lowest endemicity (less than 1%) followed by Lakshadweep (1.8%), Madhya Pradesh (above 3%) and Assam (about 5%). The seven states namely Andhra Pradesh, Bihar, Kerala, Orissa, Uttar Pradesh, Tamil Nadu, and West Bengal, where MDA pilot trials are being undertaken, contribute over 86% of microfilariae carriers and 97% of disease cases in the country.[4]

The clinical manifestations of lymphatic filariasis may vary from one endemic area to another. Generally, the most common clinical form of the disease is hydrocele, with lymphoedema and elephantiasis occurs less commonly. In India and neighbouring countries, both hydrocele and lymphoedema are common.[5] Other forms of the disease such as tropical pulmonary eosinophilia and chyluria occur less frequently. Hydrocele is not seen in areas affected by Brugian filariasis. The most significant discovery has been in the area of chronic disease, with understanding of the key role of bacterial infection in the occurrence of acute attacks and progression of the disease.[6]

The global initiatives to eliminate lymphatic filariasis as a public health problem by the year 2020 have generated a great deal of debate in India, the largest endemic country. This has led to a shift in the focus from control to elimination of the disease.[7] There is no vaccine for filariasis. Prevention centers on mass treatment with anti-filariasis drugs to prevent ingestion of larvae by mosquitoes, public health action to control mosquitoes, and individual action to avoid mosquito bites.

After a pilot project in Orissa from 1949 to 1954, the National Filaria Control Programme (NFCP) was launched in the country in 1955, with the objective of delimiting the problem, to undertake control measures in endemic areas and to train personnel to man the programme. The main control measures were mass DEC administration, antilarval measures in urban areas and indoor residual spray in rural areas. The programme was a failure. The Assessment Committee in 1970 recommended selective microfilariae carrier treatment with DEC at a dose of 6 mg/kg per day for 12 days as a compliment to antilarval measures. The Assessment Committee met again in 1982 and recommended extension of NFCP to rural areas through primary health care system with 100% central assistance for material & equipment, undertaking DEC medicated salt regimen in high endemic districts and control of Brugia malayi infection. The distribution of 0.1% DEC medicated salt to general public for one year was implemented in Lakshadweep, comprising a population of 25,000 during 1976-77 which reduced mf rate by 80% and circulating microfilariae by about 90%. The DEC medicated salt project with 0.2% concentration was concluded at Karaikal, Pondicherry which gave 98% reduction in microfilaria.

A revised program was launched in 1996-97 in 13 districts in seven endemic states namely Andhra Pradesh, Bihar, Kerala, Orissa, Uttar Pradesh, Tamil Nadu and West Bengal, where MDA was undertaken. The main strategy comprises of single day mass therapy (DEC) at a dose of 6 mg/kg body weight annually, management of acute and chronic filariasis through referral services at selective centres and information education communication (IEC) for inculcating individual/community based protective and preventive measures for filaria control, the microfilariae carriers detected in filarial clinics to be treated with a standard dose of DEC 6 mg/kg body weight. per day for 12 days.[5]

Management of acute and chronic filariasis cases requires development of adequate referral centres and treatment of adenolymphangitis with antibiotics since most of the acute episodes appear to be of bacterial aetiology. Rigorous local hygiene measures with or without local antibiotic and antifungal agents should be promoted to prevent adenolymphangitis so as to permit the reversal of lymphoedema. Early treatment with standard 12-day therapy of mf carriers is to be adopted to prevent further lymphatic damage and renal failure. The single dose mass therapy with DEC has been found to be as effective as the 12-day therapy, as a public health measure, with lesser side effects thus enhancing public compliance, and decreased delivery costs.[8] Single dose mass administration annually in combination with other techniques has already eliminated lymphatic filariasis from Japan, Taiwan, South Korea and Solomon Islands and markedly reduced the transmission in

China [9]

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