A 33-Year-Old Woman from Nigeria with Eosinophilia

(See page 1204 for Photo Quiz)

Figure 1.  Photomicrograph demonstrating the sheathed microfilaria (thick arrow) with terminal nuclei (thin arrow) of Loa loa (Wright-Giemsa stain; original magnification, ×500).

Diagnosis: Loiasis.

High-magnification microscopic examination revealed sheathed microfilariae with terminal nuclei consistent with Loa loa (figure 1; see also video 1, available in the electronic edition of Clinical Infectious Diseases). The antifilarial IgG antibody level (determined at the Immunology Service, Department of Laboratory Medicine, National Institutes of Health, Bethesda, Maryland) was extremely elevated (>469.9 μg/mL; normal level, <13.0 μg/mL), and the results of PCR analysis of blood samples for detection of L. loa were positive [1]. The results of a card test (ICT Filariasis card test; ICT Diagnostics) for Wuchereria bancrofti circulating antigen and of skin snips for Onchocerca volvulus were negative. A blood sample obtained during the period of peak microfilaremia (between noon and 4:00 P.M.) was shown to contain 3800 microfilariae/mL.

Apheresis of microfilariae performed on 2 consecutive days decreased the microfilaria count to 331 microfilariae/mL. To decrease the risk of a posttreatment reaction further, the patient was given 20 mg of prednisone both the day before and 2 days after the initiation of diethylcarbamazine therapy. She received 50 mg of diethylcarbamazine on the first day of therapy, and the dosage was gradually increased to 250 mg given 3 times per day for a 21-day course. She did not experience any adverse reactions to treatment. At 3 months of follow-up, the patient remained asymptomatic, with no further occurrences of subcutaneous swelling. The results of blood filtration and PCR for the detection of microfilariae were negative, and the patient’s eosinophil count decreased to 536 cells/μL (9.7% of the total cell count).

Loiasis is caused by the filarial nematode L. loa, which is endemic in the rain forest and swamp forest areas of central and western Africa. Infective larvae are transmitted by female
tabanid flies of the genus *Chrysops*. Larvae migrate into the subcutaneous tissue and remain itinerant throughout their adult life, which may last 17 years. Breeding adults produce microfilariae, which have a diurnal periodicity in the peripheral circulation that coincides with the peak feeding time of the intermediate insect host.

It is estimated that 3–13 million residents of areas where loiasis is endemic are infected; the majority of these persons are asymptomatic, even in the face of high microfilarial burdens [2]. However, visitors to areas of endemicity who are infected will often have symptoms, including such allergy-type complaints as pruritus or urticaria. Migration of the adult worm under the conjunctiva (“eye worm”) is a rather disturbing but characteristic feature. Calabar swellings, as demonstrated by this patient, are transient episodes of angioedema that are presumed to result from an inflammatory response to antigens from the migrating adult worm.

Loiasis is usually diagnosed by identifying microfilariae in the blood. A PCR test is also available and may allow for the diagnosis of loiasis in individuals with undetectable microfilarial burdens [1]. Serologic testing for filariae is even more sensitive, although, in the absence of characteristic symptoms, an elevated titer may simply reflect past exposure to any of the filarial parasites. Eosinophilia and elevated IgE levels are common laboratory findings. Concomitant infection with *O. volvulus* must be excluded before the initiation of diethylcarbamazine therapy, to avert serious and potentially fatal post-treatment reactions, such as encephalitis, bronchoconstriction, or postural hypotension [3]. These side-effects of diethylcarbamazine therapy can be attributed to the rapid destruction of the microfilaria and the subsequent massive release of microfilaria antigens into the systemic circulation.

The drug of choice for the treatment of loiasis is diethylcarbamazine, 8–10 mg/kg/day for 21 days. A single course of treatment may not provide complete cure, and some patients require multiple courses of treatment [4]. The side effects of treatment include fever, malaise, pruritus, urticaria, and joint pain and swelling. A serious complication of treatment is encephalitis. The risk of developing this condition can be reduced by decreasing the microfilarial burden with apheresis (where available) or other antihelminthics, such as albendazole [5], before the initiation of diethylcarbamazine therapy. Administration of steroids and antihistamines may also decrease the side effects of diethylcarbamazine treatment [6]. Prophylaxis with diethylcarbamazine, 300 mg per week, is effective for travelers to areas where loiasis is endemic [7].

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