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Case Report
Lipoma/Schwannoma

Subcutaneous Dirofilariasis Masquerading As Lipoma/Schwannoma

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An uncommon zoonotic illness called dirofilariasis is prevalent in tropical and subtropical regions of the world, including India. Canines are the principal hosts of the disease. Rarely do humans get infected by the bite of mosquitoes which act as vectors to spread the infection. Pulmonary and extrapulmonary (orbital and subcutaneous) infections are commonly seen. Here we present 2 case reports in which patients presented with subcutaneous swellings. Excision biopsy was performed in both cases. Histopathological examination revealed a Dirofilarial worm identified in the tissue sections with characteristic morphologic features. Pathologists play a crucial part in the ultimate diagnosis.

Keywords: Dirofilaria repens, subcutaneous nodules, India, zoonotic infection

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Introduction

Dirofilaria is the genus of the family Onchocercidae of the superfamily Filarioidea [1]. It is an uncommon vector-borne disease caused by filarial nematodes associated with mainly carnivores as hosts such as dogs, cats, and wild mammals. Humans are accidental hosts. Only six species cause disease in humans. The most common species infecting are *Dirofilaria repens and Dirofilaria tenuis* (causes subcutaneous infection) *and Dirofilaria immitis* (causes pulmonary dirofilariasis)[2] [3]. Species differ depending on the geographical location and are endemic to Southern and Eastern Europe, and Asia, mainly Sri Lanka, Malaysia, and India [4]. Transmission is by the bite of a mosquito (Anopheles, Aedes and Culex species)[5].

Case Reports

In our first case, a 19-year-old boy, hailing from Kannur, came with swelling over his right ankle near the tendon Achilles region. The hemogram was normal with a mild increase in eosinophils (08%), an absolute eosinophil count of 510 cells/ml of blood indicating mild eosinophilia and an ESR = 21 mm at the end of one hour. A soft tissue scan revealed an oval hypoechoic lesion measuring 2 x 1.4 x 0.4cm just deep to the deep fascia in the posterior aspect of the lower 1/3rd leg. Within the centre of the hypoechoic lesion, a tubular coiled structure with hyperechoic walls was noted having a diameter of 0.6mm. Mass was excised and sent for histopathological examination. A gross examination showed grey white and firm mass with normal overlying skin. The cut surface was solid grey-white. After haematoxylin and eosin staining, microscopy showed an area displaying dense inflammatory cells with a granulomatous response. Epithelioid and foreign body giant cells were noted [Figure 1]. The Centre of the inflammatory process showed a parasite displaying longitudinal ridges with thick smooth cuticles, muscular layer and internal organs were seen [Figure 2].

In our second case, a 61-year-old male, farmer hailing from Mangalore, Southern Karnataka came with swelling over the right anterolateral aspect of his thigh for 2 – 3 years. A provisional clinical diagnosis of lipoma was made. The hemogram Was normal. The swelling was excised and sent for histopathological examination. Gross examination showed a mass measuring 3.4 x 2.4 x 1.3cm. Circumscribed, dark brown with an unremarkable overlying skin. The Cut surface showed a dark brown lesion with gelatinous greenish-brown material. Microscopically, the dirofilaria with outer cuticle and longitudinal ridges and well-developed inner musculature. Intestinal tubule (IT) was seen [Figure 3]. The surrounding tissue was fibrotic and densely infiltrated by neutrophils, and eosinophils, admixed with neutrophilic debris. [Figure 4].

The final diagnosis of parasite infestation favouring Dirofilaria repens was made.

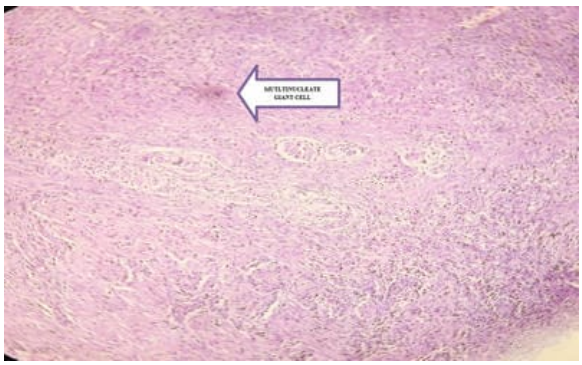

Figure 1: Intense inflammatory response showing neutrophils, lymphocytes, plasma cells and eosinophils along with foreign body giant cells and epithelioid cells. [H&E stain 20x], Department of Pathology, K.S. Hegde Medical Academy, Mangaluru

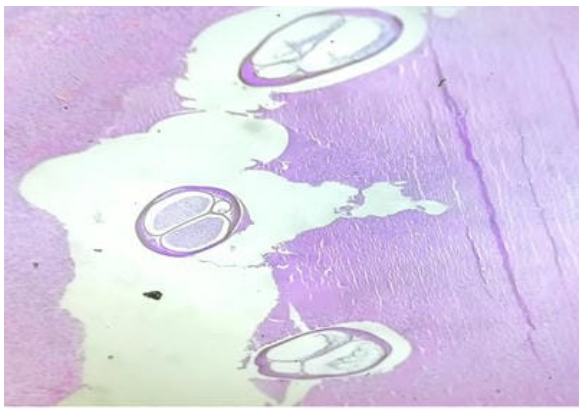

Figure 2: Cross-section of the adult worm surrounded by a dense inflammatory response. [H&E stain 20x], Department of Pathology, K.S. Hegde Medical Academy, Mangaluru

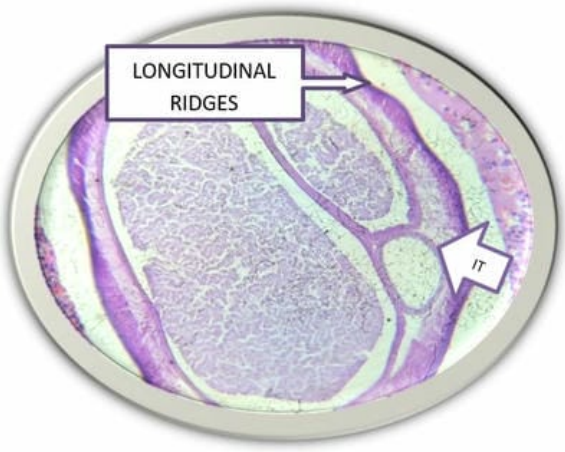

Figure 3: Cross-sectional morphology of the Dirofilaria worm with outer cuticle and longitudinal ridges with well-developed inner musculature. Intestinal tubule (IT) is seen. [H&E stain 40x], Department of Pathology, K.S. Hegde Medical Academy, Mangaluru

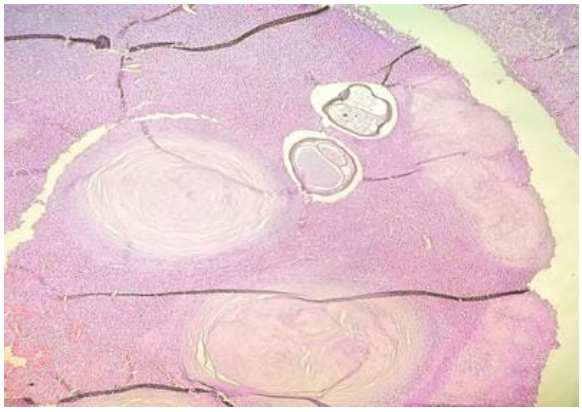

Figure 4: Cross-sectional morphology of the Dirofilaria worm with the outer cuticle, surrounded by intense granulomatous inflammatory response and fibrosis. [H&E stain 20x], Department of Pathology, K.S. Hegde Medical Academy, Mangaluru

Ophthalmologic examination of both cases was negative for parasite infestation.

Discussion

Human dirofilariasis is a zoonotic infection caused by a nematode [4]. Canines are the primary hosts for this filarial worm. Adult worms reside in the subcutaneous tissue of the infected hosts and produce microfilaria in their circulation. Transmission is by mosquitoes such as Aedes, Anopheles or Culex.

Female worm of dirofilaria releases microfilariae into the blood circulation which is ingested by mosquitoes. Humans are the dead-end hosts. Important risk factors in human infections are the density of mosquitoes, hot climate, breeding season, outdoor human activities and the presence of dogs infected with microfilaria. These environmental conditions are seen more in the Southern part of India as seen in both of our cases.

The sexual reproduction of Dirofilaria repens involves five developmental phases, with the primary vertebrate host—typically a dog or cat—and an arthropod intermediate host or vector. The immature filaria travel subcutaneously, matures into adult worms, and finally die, causing a Th2-type inflammatory response that is primarily mediated by eosinophils. Typically, blood counts, including white blood cells, fall within normal limits [5].

There are two types of human dirofilariasis: pulmonary and extrapulmonary. Subcutaneous, visceral, and ocular dirofilariasis are further classifications for extrapulmonary dirofilariasis [1].

The pulmonary form is brought on by D. immitis and the subcutaneous form is typically caused by D. repens and D. tenuis. Most human instances that have been documented involve subcutaneous disease, in which the worms may cause a granulomatous reaction leading to a clinical nodule in the subcutaneous tissues.

D.immitis has a smooth cuticle that is typically seen in pulmonary arteries and D.repens (as in our case) exhibits longitudinal cuticular ridges and is found in subcutaneous tissues. Dirofilaria is rare in India(3). Clinical symptoms of pulmonary dirofilariasis are cough, chest discomfort, fever, and pleural effusion. Reports of subcutaneous dirofilariasis are quite rare. Human dirofilariasis is clinically significant because subcutaneous lesions may be mistaken for malignant tumours at first, necessitating invasive testing and surgery before the proper diagnosis is established [1].

The most important step in treating human dirofilariasis is diagnosis. Different diagnostic problems arise for human pulmonary and subcutaneous/ocular dirofilariasis. When worms are localized in the eyes or form subcutaneous nodules, the patient is typically the one to first

Become aware of the infection and seek medical assistance. As opposed to this, pulmonary nodules are found deep within the body and are typically asymptomatic. Additionally, a small percentage of lung nodules are accidentally discovered during chest X-ray procedures, which are typically carried out for purposes unrelated to dirofilariasis [6].

Only after an excision biopsy can the diagnosis of dirofilariasis be determined with certainty, and the parasite's microscopic characteristics are used to identify its species. Therefore, pathologists must understand the parasite's histological characteristics as well. DNA analysis based on polymerase chain reaction can accurately identify species [3]. The only effective treatment for human subcutaneous dirofilariasis is surgical removal of the lesion. Benign or malignant tumours, lipomas, granulomas, and infected cysts or abscesses are among the differential diagnoses for subcutaneous dirofilariasis.

Treatment with diethylcarbamazine and ivermectin can be given as chemotherapy [4].

Conclusion

An infection by a parasite that is becoming more and more common in humans is subcutaneous dirofilariasis, particularly in tropical areas. It is vital to recognise and diagnose early because delaying diagnosis can result in unwarranted invasive tests and treatments. Insect bites can be avoided in endemic areas by taking appropriate precautions, such as using insecticide-treated bed nets or cosmetics that repel insects. Histopathological examination plays a crucial role in the diagnosis.

Declaration Of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the forms, the patients have given their images and other clinical information to be reported to the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts Of Interest

There are no conflicts of interest.

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