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BMH Med. J. 2023;10(1):14-17. **Case Report**

A Painful Neck Swelling to the Emergency Department - An Uncommon Presentation of Human Subcutaneous Dirofilariasis

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Abstract

Human subcutaneous dirofilariasis is a rare zoonotic filarial infection caused by filarial worms of the genus Dirofilaria. In view of the recent rise in human *Dirofilaria repens* infections in several regions of the world, it is now considered as an emerging zoonotic infection transmitted to man by zooanthrophilic blood sucking insects. Most of the documented cases of human dirofilariasis recorded in India are ocular infections and very few cases of subcutaneous dirofilariasis have been reported. We hereby present a case of subcutaneous human dirofilariasis of the neck and also emphasize on increased awareness of this entity for clinicians and radiologists in the differential diagnosis of patients with subcutaneous nodules.

Keywords: Dirofilariasis, subcutaneous, neck

Introduction

Dirofilariae primarily infect dogs, cats and raccoons, but can incidentally infect humans. Because humans are an abnormal host, the parasites never develop fully. Pulmonary dirofilarial infection caused by the canine heartworm *Dirofilaria immitis* generally presents in humans as a solitary pulmonary nodule. Chest pain, hemoptysis and cough are uncommon. Infections with *D. repens* (from dogs) can cause local subcutaneous nodules in humans [1].

There are about 40 recognized species of *Dirofilaria* and at least six of them i.e., *Dirofilaria immitis, Dirofilaria repens, Dirofilaria striata, Dirofilaria tenuis, Dirofilaria ursi* and *Dirofilaria spectans* are known to cause accidental infections in humans [2]. Human subcutaneous dirofilariasis is caused by the species *Dirofilaria repens*. The usual definitive host of this parasite is the dog although cats and wolves may also act as hosts. Mosquitoes of the genera *Aedes*, *Anopheles*, and *Culex* are suitable intermediate hosts and vectors. Some species of fleas, lice, and ticks may also act as vectors [3].

Case History

An elderly man who was a known case of coronary artery disease, hypertension, dyslipidemia and

hypothyroidism on regular medication presented to the emergency department with an abrupt onset swelling on the right side of his neck since 1 day which was associated with local pain and pruritus (**Figure 1**). He had no history of fever, dyspnoea, dysphagia or odynophagia. On primary survey, he had a patent airway, was talking and breathing comfortably and was fully conscious and oriented. He had no evidence of bite or sting marks. He also had no history of any recent new drug intake. There were no other swellings or hepatosplenomegaly detected. His vitals at presentation were stable with a BP of 140/90 mm Hg, heart rate of 80/min, respiratory rate of 18/min and SpO2 of 99% in room air.

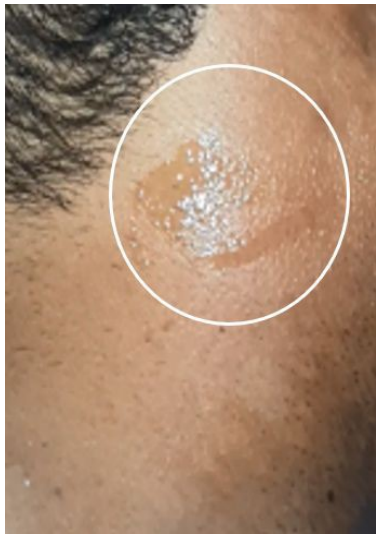

Figure 1

On acquiring the history, the patient revealed that he had a similar painful and pruritic swelling appear on his right wrist around 3 months back which disappeared in 3 days without treatment. This was followed by a similar swelling on his right shoulder 1 month later which also disappeared after 3 days without treatment.

Point of care ultrasound of the swelling was done from the emergency department which revealed a cystic lesion in the subcutaneous plane with some unidentified floating structures within (**Figure 2**). Due to diagnostic uncertainty, the patient was referred to the radiology department for expert ultrasound and was reported as a case of subcutaneous dirofilariasis. He was discharged home with antihistamines and advised to come for follow up once in 2 weeks. By the second follow up visit, his swelling had completely disappeared and he was free of pain.

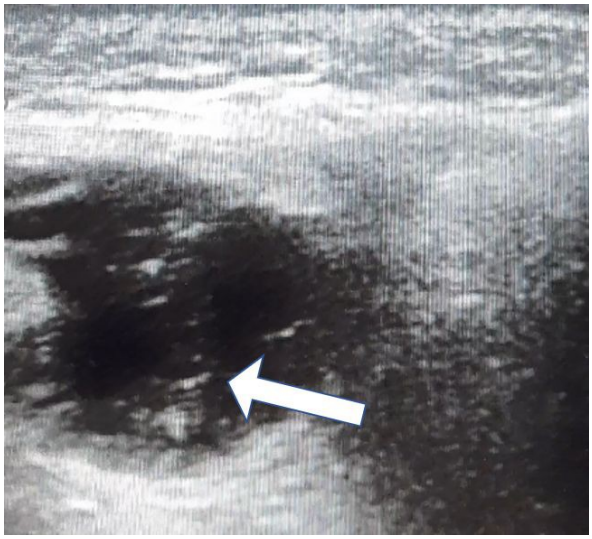

Figure 2

Discussion

The first report of human dirofilariasis dates back to the report of Addario in 1885 from Italy. Since then about 800 cases are reported worldwide. The reports of dirofilariasis are increasing nowadays and today it is considered as an emerging zoonosis [3]. Pampiglone has reported the largest series of 60 cases from Italy in 2001 [4]. The first case of subcutaneous dirofilariasis from Kerala was reported by Senthivel and Pillai (1999) in a female from Palakkad district [5]. The largest case series of subcutaneous dirofilariasis in Kerala was reported by Elizabeth Joseph et al. in 2011 [3].

Human dirofilariasis is an accidental infection caused by species of *Dirofilaria* such as *Dirofilaria immitis* (canine heartworm), *Dirofilaria tenuis* and *Dirofilaria repens*. It is a zoonotic infection seen worldwide. Mosquitoes belonging to the genera *Culex*, *Aedes*, *Armigeres* and *Anopheles* are vectors for the parasite. They take up microfilaria larvae while feeding on an infected host. In the malphigian tubules of the vector, the microfilaria larvae develop into infective 3rd stage microfilariae which subsequently migrate through the body cavity to the proboscis of the vector. Transmission of the infective stage takes place when the potential vector bites dogs or other hosts including humans [6].

Kerala, the southern state of India is endemic for both canine and human dirofilariasis [7]. The most important risk factors regarding human infections are mosquito density, warm climate with extended mosquito breeding season, outdoor human activities and the abundance of microfilaremic dogs [3]. A study on microfilaremic dogs in Kerala from 2005 reported an incidence of microfilaremia of 7% (n=160) [8]. Subcutaneous dirofilariasis is mostly caused by *D. repens* in Asia. It is suggested that patients usually present with a single migratory nodule which may or may not be tender [5]. The immature filaria migrate subcutaneously, undergoes development into an adult worm and then dies inciting an inflammatory reaction dominated by eosinophils. Blood counts including the white cell differentials are usually within normal limits [9].

Subcutaneous dirofilariasis can mimic various benign and malignant lesions. Breast nodules due to *D. repens* infection may be misdiagnosed as potential malignancy. Hence it is important that clinicians should be familiar with this entity and include it as a differential diagnosis of subcutaneous nodules [3].

The diagnosis of dirofilariasis can be made with certainty only after excision biopsy and the species identification is based on microscopic features of the parasite.[3] The worms which belong to the genus, Dirofilaria are identified by their thick laminated cuticle, broad lateral ends and large muscle cells. *D. immitis* can be differentiated from *D. repens* by the absence of ridges [10]. The precise identification of species may be achieved with DNA analysis based on polymerase chain reaction.

Although the incidence of human subcutaneous dirofilariasis has been increasing over the last 5 decades, the imaging features of dirofilariasis are not well known. In 2008 a case of orbital dirofilariasis was reported from Government Medical College, Kozhikode by Devarajan E et al. which showed the USG features of subcutaneous dirofilariasis [11]. In the said report the diagnosis which was uncertain after contrast enhanced CT scan of the orbit was finally clinched by high resolution USG of the lesion which showed an actively motile folded tubular structure with parallel echogenic walls similar to the pictures seen in our case. This further emphasises the potential of high-resolution USG in providing dynamic, real-time imaging, even in this era of newer and more sophisticated imaging modalities.

In summary, dirofilariasis should be included in the differential diagnosis of subcutaneous nodules especially in an endemic area. Surgical removal is the choice of definitive treatment. Cases of human dirofilariasis are under reported because either most remain undiagnosed, or unpublished or

unidentified because of lack of awareness among the treating clinicians. Documentation by publishing the matter is important to understand the actual prevalence of human dirofilariasis in different regions of the world.

References

1. Thomas B. Nutman, Peter F. Weller. Filarial and Related Infections. In: J. L. Jameson, editor. Harrison's Principles Of Internal Medicine, 20th edn. New Delhi: McGraw-Hill Education; 2018. p. 1635.

2. Reddy MV. Human dirofilariasis: An emerging zoonosis. Trop Parasitol. 2013 Jan;3(1):2-3.

3. Joseph E, Matthai A, Abraham LK, Thomas S. Subcutaneous human dirofilariasis. J Parasit Dis. 2011 Oct;35(2):140-3.

4. Pampiglione S, Rivasi F, Angeli G, Boldorini R, Incensati R M, Pastormerlo M, et al. Dirofilariasis due to Dirofilaria repens in Italy, an emergent zoonosis: report of 60 new cases. Histopathology 2001;38:344-54.

5. Senthilvel K, Madhavan Pillai K. A case of subcutaneous dirofilariasis in a woman in Kerala. Indian veterinary journal. 1999;76(3):263-4.

6. Kotigadde S, Ramesh SA, Medappa KT. Human dirofilariasis due to Dirofilaria repens in southern India. Trop Parasitol. 2012 Jan;2(1):67-8.

7. Sreelakshmi PR, Jacob A, Sincy V, Ajith C, Reghu R, Anish TS. Epidemiological Investigation on Subcutaneous Nodule Containing a Live Worm Suspected to be Dirofilaria Repens Infection in a Woman from Rural Kerala, India. J Glob Infect Dis. 2013 Jul;5(3):122-3.

8. Sabu L, Devada K, Subramanian H. Dirofilariosis in dogs and humans in Kerala. Indian J Med Res. 2005;121(5):691-3.

9. Kini RG, Leena JB, Shetty P, Lyngdoh RH, Sumanth D, George L. Human dirofilariasis: an emerging zoonosis in India. J Parasit Dis. 2015 Jun;39(2):349-54.

10. Achappa B, Madi D, Mahalingam S. An interesting case of a subcutaneous nodule. J Clin Diagn Res. 2013 Feb;7(2):364-5.

11. Smitha M, Rajendran VR, Devarajan E, Anitha PM. Case report: Orbital dirofilariasis. Indian J Radiol Imaging. 2008 Feb;18(1):60-2.