

Human intramuscular dirofilariasis: The silent masquerader

Sunayana Mukesh Jangla¹, Uma Pankaj Chaturvedi², Raji Pillai²

From ¹Consultant Clinical Microbiologist, Department of Pathology, ²Pathologist, Department of Pathology, Bhabha Atomic Research Centre Hospital, Mumbai, Maharashtra, India

ABSTRACT

Dirofilariasis is an uncommon zoonotic infection transmitted by mosquitoes. In humans, it generally presents as nodules in the lungs, subcutaneous tissue, peritoneal cavity, or eyes. However, the present case series is regarding adult worms of *Dirofilaria repens* recovered from the masseter muscle of two patients in the fourth decade of life. Diagnosis was given on the basis of worm morphology and histopathology and confirmed by polymerase chain reaction. Surgical excision of the worm was done and pharmacotherapy with diethylcarbamazine was given. This report is remarkable as these cases arrived with identical clinical presentations and resided in close proximity to each other. Such atypical infections should be borne in mind, especially in light of current climatic changes and emerging zoonotic infections.

Key words: Dirofilaria, masseter muscle, repens

Filarial nematodes of medical importance include *Wuchereria bancrofti*, *Brugia malayi* and *Brugia timori*, *Loa loa*, *Onchocerca volvulus*, *Mansonella streptocerca*, *Mansonella ozzardi*, and *Mansonella pertusans*. In humans, they inhabit the lymphatics, subcutaneous tissues, connective tissues, muscle, and body cavity of the host [1]. Filarioids belonging to the genus *Dirofilaria*, especially *D. immitis* and *D. repens* are emerging causes of human zoonosis worldwide [2]. With a varied prevalence globally, most cases of human dirofilariasis are reported in the Mediterranean region, Russia, and Asia. Its prevalence in south India is about 4.4% with a handful of cases in North India [2,3]. Human dirofilariasis is typically found in canines, but accidental human infection can occur. *Dirofilaria* are transmitted to humans through the bite of infected mosquitoes. After infection, circulation of larvae occurs in the bloodstream and migration takes place to various sites where they develop into adult worms. Dirofilariasis typically manifests in humans as pulmonary, ocular, or subcutaneous lesions but occasionally paramaseteric and intra-muscular involvement is seen [3].

We report a case series of dirofilariasis involving the masseter muscle and the challenges faced in diagnosing it. It highlights the significance of considering parasitic infections as a differential diagnosis in patients with swelling in the facial region. Awareness of such an atypical presentation of the disease and its epidemiology paves the way for early diagnosis and prompt management.


CASE SERIES

Case 1

A 46-year-old male presented with swelling on the right cheek since one month for the first time. No such swelling was present in any other body part on presentation or in the past. There was no pain, itching or redness at that site, fever, or trauma. It did not increase in size during chewing. He is a government employee, married, and a pure vegetarian residing in Mumbai. He does not have pets nor history of contact with stray animals. He had traveled to Chindwada in Madhya Pradesh in May of the same year. He had completed antibiotics course for the cheek swelling but there was no change in size.

On examination, the swelling was 1 × 1 cm on the right cheek around 5 cm anterior to the tragus. It was smooth, firm, immobile, and non-tender without overlying redness. Oral and bilateral ear examination was normal. His vital parameters and general examination were normal. The total blood cell count was 11,300/cmm. The absolute eosinophil count was 186 cells/cmm. No parasite was detected on the peripheral smear. Serum IgG level was 1486 mg/dL. Filarial antigen and Filarial antibody (IgG and IgM) were negative. Ultrasonography showed actively motile tubular structures suggestive of parasitic infection.

The surgical excision of the cheek swelling was done which revealed two white worms sent to the laboratory in formalin. They measured 6 and 7 cm in length (Fig. 1). Both worms had one end

Access this article online	
Received - 24 October 2024 Initial Review - 09 November 2024 Accepted - 10 January 2024	Quick Response code 
DOI: 10.32677/ijcr.v11i2.4879	

Correspondence to: Dr. Sunayana Mukesh Jangla, Department of Microbiology, Bhabha Atomic Research Centre Hospital, Mumbai - 400 094, Maharashtra, India. E-mail: saumyananda66@googlemail.com

© 2025 Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC-ND 4.0).

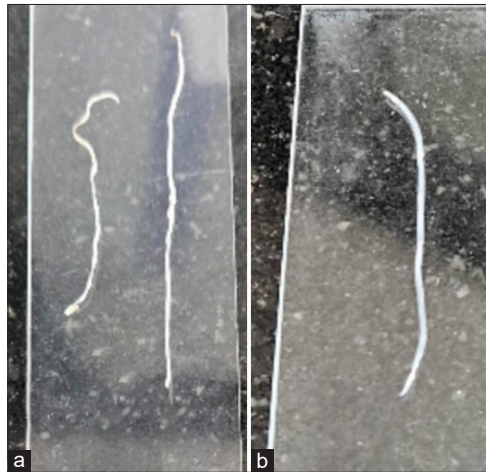


Figure 1: Worms from case no.1 (a) and case no.2 (b)

rounded and the other end tapering. Their high-power microscopy showed a thick outer layer with longitudinal ridges along the cuticle and a tubular structure in the center (Fig. 2). Multiple eggs were seen inside this tube in both. Histopathologic examination of tissue showed a cystic area with surrounding inflammatory cell infiltrate composed predominantly of eosinophils and histiocytes with granulation tissue surrounded by muscle fibers and fat. The cyst was lined by histiocytes and giant cells. Transverse sections of adult worms were seen within the cyst cavity. These sections showed a thick cuticular layer with striations, a thick muscular layer, a reproductive tube, and intestine (Fig. 3). Some of the sections revealed adult worm with gravid uterus. Based on histopathological findings worm was identified as a filarial nematode. On the basis of morphology and other findings it was identified as *Dirofilaria repens*. He was advised diethyl-carbamazine citrate 100 mg thrice a day for 4 days. He was asymptomatic at the end of 3 months.

Case 2

Two weeks after the above case, a 47-year-old female, married, home-maker presented with swelling on the left cheek since 15 days for the 1st time. No such swelling was present in any other part of the body at the time of presentation or in the past. There was no pain, itching or redness at that site, fever, or trauma. It did not increase in size during chewing. She resides in Mumbai in hospital quarters and has an omnivorous diet including chicken and goat meat. She does not have pets, a history of contact with animals, or a significant travel history in the recent past and is not related to the first case.

On examination, the swelling was 2 × 2 cm on the left cheek below the eye (Fig. 4). It was smooth, firm, immobile, and non-tender. Oral and bilateral ear examinations were normal. Her vital parameters were normal and her general examination was normal. The total blood cell count was 9000 cells/cmm. Absolute eosinophil count was 400 cells/cubic millimeter. No parasite was detected on the peripheral smear. Serum IgE level was 524 mg/dL which after two weeks was 1809 mg/dL. Filarial antigen and antibody (IgG and IgM) were negative.

Surgical excision of the cheek swelling was done which revealed one adult worm sent to laboratory in saline. It was

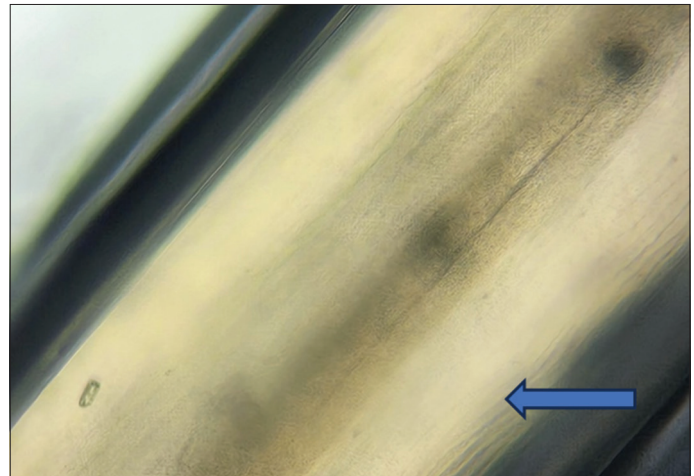


Figure 2: Longitudinal ridges of worms

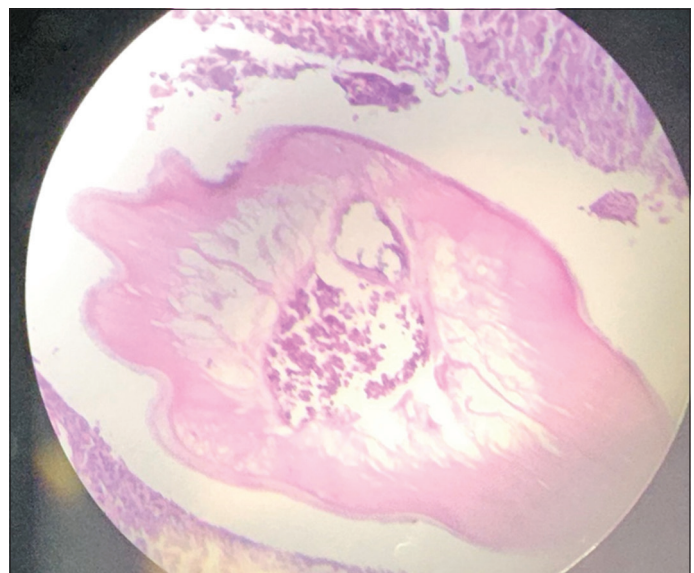


Figure 3: Histopathology image of muscle from case no.1

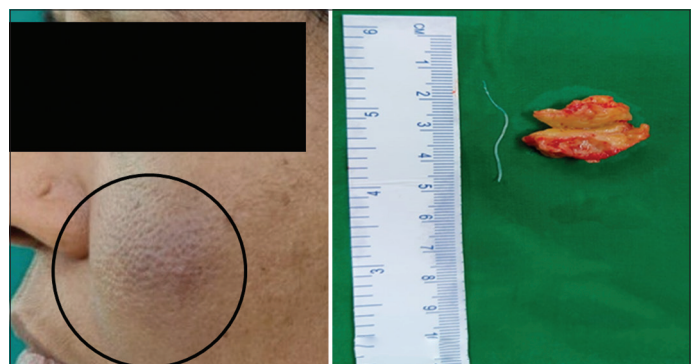


Figure 4: Swelling on the left cheek along with excised tissue of case no.2

3.5 cm in length (Fig. 1). One end was rounded and the other end tapering. Under high power, a thick outer layer with longitudinal ridges along the cuticle and a tubular structure in the center were seen (Fig. 2). Histo-pathological examination of tissue showed muscle tissue surrounded by severe mixed inflammatory infiltrate of eosinophils, few lymphocytes and histiocytes with focal lymphoid aggregates and fibrosis suggestive of inflammatory

reaction to parasitic infection. Parasite was not identified in the section. The worm was identified as *D. repens*. It was sent for polymerase chain reaction (PCR) which confirmed it to be *Dirofilaria*. She was advised diethylcarbamazine citrate 100 mg thrice a day for 4 days. She was asymptomatic at the end of 3 months.

DISCUSSION

Human dirofilariasis is a zoonotic nematode infection transmitted through bites of mosquito species, such as *Aedes*, *Anopheles*, *Culex*, and *Mansonia*. *D. immitis*, *repens*, and *tenuis* are the most common species affecting humans. Their natural hosts are dogs and wild canids. Usually, pulmonary coin lesions are caused by *D. immitis* infection which may or may not be symptomatic. *D. repens* infection classically manifests as subcutaneous or submucosal nodules containing adult worms. During a blood meal, the first-stage larvae circulating in the peripheral bloodstream of the natural hosts are taken up by mosquitoes. Inside the mosquito, the larvae mature and the third-stage larvae are inoculated into humans through a bite. These mature into adults in humans who are accidental dead-end hosts [4].

In India, dirofilariasis is endemic in Kerala with significant geographical variation in India [5,6]. Our patients reside in Mumbai close to each other at a distance of one and a half km and have no significant travel history. The disease is commonly encountered in the fourth and fifth decades of life [6]. Both our patients also were otherwise asymptomatic and in the fourth decade of life. IgE levels in the second case were elevated suggestive of a parasitic infection. The morphology of the worms was suggestive of nematode. The common nematodes found in tissue as adult worms are *Trichinella spiralis*, *O. volvulus*, and *Wuchereria bancrofti* [1]. Their blood reports were negative for *W. bancrofti* antigen and antibody and *Brugiya malai* antibodies which are the most common filarial worms. The size of the worms did not match that of *T. spiralis*. Microfilaremia is generally not seen in dirofilariasis as the adult worms die before the stage where they can produce microfilaria analogous to our case [4,6].

Histopathological examination of tissue of the first case demonstrated a parasite with a thick cuticular layer with striations, a thick muscular layer, reproductive tube containing the gravid uterus with multiple eggs and intestine. Both cases also showed inflammatory reactions. Affirmative to the above facts was the demonstration of longitudinal ridges along the cuticle in both cases which supported the identification of *D. repens*. Similar findings were reported by other authors [1,5,7]. For the second case, the identification of the genus was confirmed using PCR. However, PCR couldn't be performed for the first case as those worms were received in formalin.

There was a difference in the size and internal structure of the worm in both cases. Microscopy of worms in the first case also revealed multiple eggs. It is probable these could be females with gravid uterus and the presence of more than two worms as per

histopathology findings. The worm from the second case could be male as it was shorter without eggs.

Patients with subcutaneous dirofilariasis typically report a firm nodule, classically in the upper parts of the body, such as the eye, conjunctiva, and left cheek [5,6,8]. Our patients also had swelling at a similar site. However, the presence of muscle fibers on histopathology pointed toward an intramuscular parasitic infestation. This makes this report more interesting as cases of intra-muscular dirofilariasis in literature are few and far beyond thus highlighting that it can have a varied presentation [3].

Surgical excision of the lesion is the definitive treatment. Ivermectin and diethylcarbamazine help stop the migration of the worm [3,9]. A similar line of management was followed in our cases. These patients who probably acquired infection through mosquito bites presented within a span of two weeks and resided in close proximity to each other. Hence they were advised to check for mosquito-breeding areas in their locality and inform local authorities in addition to taking anti-mosquito precautions. Changing climatic conditions can cause temperature rise encouraging mosquito breeding and disease transmission by shortening the lifecycle, duration, and generation time of various vector species aiding the potential transmission of pathogens. Climate alteration can influence land use patterns further influencing habitat distribution of vector species promoting disease spread to newer areas and larger populations [4,10] adding to an increase in the incidence of similar zoonotic infections. Transforming agricultural practices can cause humans dwelling in the vicinity of vectors [2].

CONCLUSION

This report emphasizes the importance of considering parasitic infections and their atypical presentation as a differential diagnosis in patients with swelling in the facial region, especially in tropical countries in view of changing climatic conditions. Due to cognizance of the disease and its epidemiology, such a tricky diagnosis can be prompt aiding in effective patient management. Supportive measures include insect-repellent creams or bed nets, insistence on preventing mosquito breeding in the environment, and reducing parasitic infection prevalence among animal hosts.

ACKNOWLEDGMENT

1. Dr. Kumarswamy N Salimath (MS, ENT), Department of ENT, Bhabha Atomic Research Centre Hospital, Trombay, Mumbai 400-094 (treating consultant of case 1)
2. Dr. Dhanashree G Chiplunkar (MS, ENT), Department of ENT, Bhabha Atomic Research Centre Hospital, Trombay, Mumbai 400-094 (treating consultant of case 2)
3. Dr. Sumeeta Khurana, MD, Professor and Head, Dept. of Medical Parasitology, Postgraduate Institute of Medical Education and Research, Chandigarh (for contribution to PCR testing).

REFERENCES

1. Parija CS. Textbook of Medical Parasitology. 4th ed. Chennai: All India Publishers and Distributors 2013. p. 274-8, 314-41.
2. Ghasemi E, Shamsinia S, Taghipour A, Anvari D, Bahadory S, Shariatzadeh SA, *et al.* Filarial worms: A systematic review and meta-analysis of diversity in animals from Iran with emphasis on human cases. *Parasitology* 2020;147:909-21.
3. Dosemane D, Khadilkar MN, Sriperumbudur S, Aggarwal I. Unusual cause of unilateral facial oedema: Intramuscular dirofilariasis. *Eur Arch Otorhinolaryngol* 2023;280:4291-3.
4. Joseph M, Krishna M, Vijayan A. Human subcutaneous dirofilariasis. *Cureus* 2023;15:e35879.
5. Srinivasan S, Srinivaasan M. Dirofilariasis of breast mimicking malignancy - A rare entity. *J Midlife Health* 2023;14:146-8.
6. Das AT, Soman S, Thomas T, Aslam SA, Kalathil LS, Vijayakumar D. Paramastetric subcutaneous dirofilariasis: A rare entity. *Indian J Otolaryngol Head Neck Surg* 2021;74:5445-7.
7. Wendum D, Campa P, Develoux M, Zmuda M, Putterman M, Hennequin C. Dirofilariasis: A parasitic cause of subcutaneous nodule. *Clin Microbiol Infect* 2019;25:1231-2.
8. Mistry AM, Hoejvig J, Helleberg M, Stensvold RC, Jokelainen P, Noehr A, *et al.* Human subcutaneous dirofilariasis: The 'migrating' skin tumor. *Case Rep Plast Surg Hand Surg* 2021;8:181-5.
9. Capelli G, Genchi C, Baneth G, Bourdeau P, Brianti E, Cardoso L, *et al.* Recent advances on *Dirofilaria repens* in dogs and humans in Europe. *Parasit Vectors* 2018;11:663.
10. Medlock JM, Leach SA. Effect of climate change on vector-borne disease risk in the UK. *Lancet Infect Dis* 2015;15:721-30.

Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Jangla SM, Chaturvedi UP, Pillai R. Human intramuscular dirofilariasis: The silent masquerader. *Indian J Case Reports*. 2025; 11(2):49-52.