

Case Series

Subcutaneous dirofilariasis: case series

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ABSTRACT

Dirofilariasis is a parasitic infection caused by *Dirofilaria* worms, transmitted through mosquito bites, primarily affecting dogs but also affecting humans incidentally. This introduction provides an overview of the various forms of dirofilariasis, with focus on subcutaneous and pulmonary types, and highlights its geographical distribution. Subsequent case reports describe 3 instances of dirofilariasis in different anatomical locations, emphasizing diagnostic findings and successful surgical treatment. Discussion delves into nature of human subcutaneous dirofilariasis (HSD), emphasizing *D. repens* and *D. immitis* as common causative species. It explains lifecycle of these parasites, their transmission through mosquito vectors, and various clinical manifestations based on species and affected body areas. Diagnostic approaches are elucidated with particular focus on importance of HPE in identifying specific species. This case series highlights importance of increased awareness, diagnostic tests, and vector control is emphasized to enable early detection and treatment, thus avoiding further complications and mortality associated with the dirofilariasis.

Keywords: Dirofilariasis, Cystic lesion, Inflammation, Surgical excision

INTRODUCTION

Dirofilariasis is a parasitic infection caused by *Dirofilaria* worms, which are spread by mosquitoes. Dogs and other predators are primary hosts, although people can become infected accidentally. Based on type of worm and site of infection, there are many forms of dirofilariasis. Subcutaneous dirofilariasis, which is caused by *D. repens*, *D. tenuis*, and other organisms and pulmonary dirofilariasis caused by *D. immitis* (the dog heartworm), are 2 most prevalent kinds. Geographical distribution: European countries such as Italy, France, Greece and Spain. Sri Lanka is the most affected country in Asia with an infection rate of almost 60% in dog population.^{1,2} In India: most no. of cases reported from Kerala. We report 3 cases of dirofilariasis treated with surgical excision.³

CASE SERIES

Case 1

A 22 year old female came to gastroenterology OPD with complaints of long standing-early morning nausea,

vomiting, bleaching, and abdominal wall swelling which gradually increased in size since 2 weeks. Swelling was associated with itching and occasional pain. Patient reported having a pet dog at home.

On physical examination right hypochondriac region-1×1 cm cyst swelling palpable, non tender, no redness, no local rise of temperature, scratch marks seen. Other systemic examinations are essentially normal.

Laboratory investigations were within normal limits.

Ultrasound examination was suggestive of cystic lesion measuring 1.2×0.7 cm with internal tubular serpiginous structures with parallel echogenic walls and anechoic center in anterior abdominal wall subcutaneous plane, along right hypochondriac region. Surrounding diffuse fat inflammatory changes with minimal subcutaneous edema is seen.

The patient underwent excision of subcutaneous lesion under local anesthesia, a cystic lump hard in consistency was found. Specimen sent for histopathology

examination, which was suggestive of: microscopic examination- fibroadipose tissue with inflammation consisting of histiocytes, lymphocytes and plasma cells. The worm was identified as a *Dirofilariasis* based on its characteristic morphological features. Postoperatively patient was given doxycycline for 10 days. Patient is on regular follow no recurrence noted.



Figure 1: Gross: irregular fibrofatty tissue measuring 3.5×3.5×1 cm. Cut section show cystic area measuring 0.5×0.5 cm with worm.

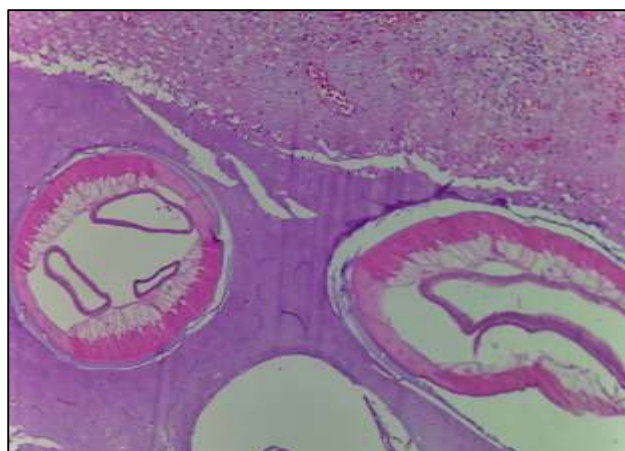


Figure 2: Microscopy: sections show fibroadipose tissue with inflammation consisting of histiocytes, lymphocytes and plasma cells.

There is a central cystic space with multiple sections of *Dirofilaria* parasite. Areas show capillary sized vessels

Case 2

A 28 year old female came to the general surgery OPD with complaints of swelling over right calf for a few months. On physical examination right calf 3 cm below popliteal fossa 1×2 cm smooth globular structure, non-tender, no local rise of temperature, was noted. Laboratory investigations were within normal limits. Ultrasound examination was suggestive of-A well-

defined oval cystic lesion measuring 10×6×10 mm noted in the subcutaneous plane of the right proximal leg in the posterior aspect. The lesion shows coiled linear internal structures with echogenic parallel walls which shows live mobility during the examination. No internal vascularity on Doppler evaluation. Features in favor of *dirofilariasis*

The patient underwent excision biopsy of subcutaneous lesion- right calf under local anesthesia.

Specimen sent for histopathological examination, which was suggestive of: microscopic examination of the biopsy specimen of fibro-collagenous tissue with a cyst devoid of epithelial lining shows inflammation consisting of lymphocytes, histiocytes and neutrophils. A few scattered neutrophils were seen. The lumen shows sections of *Dirofilaria* within the cyst. Granulation tissue noted. The worm was identified as a *dirofilariasis* based on its characteristic morphological features. Patient was given antibiotics as surgical prophylaxis. No recurrence noted on regular follow up.

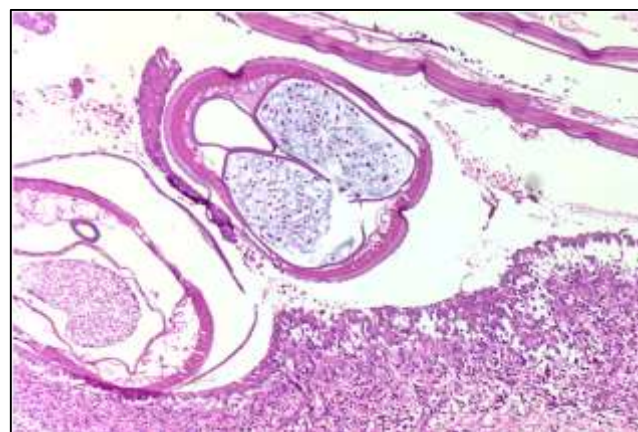


Figure 3: Microscopy: sections show fibro-collagenous tissue with a cyst devoid of epithelial lining.

The cells show inflammation consisting of lymphocytes, histiocytes and neutrophils. A few scattered neutrophils were seen. The lumen shows sections of *Dirofilaria* within the cyst. Granulation tissue noted

Case 3

A 62 year old male came to orthopedic OPD with complaints of right elbow pain for 6 months. Patient is known case of hypertension and diabetes mellitus on treatment.

On physical examination right elbow -nodular mass along the medial epicondyle no numbness, no local rise of temperature.

Laboratory investigations were essentially normal.

Ultrasound examination was suggestive of-A thick-walled hypoechoic lesion of size 1.2×2 cm having linear

tubular internal contents is seen just above the level of medial epicondyle. Surrounding inflammation is seen.

The patient underwent right elbow medial epicondyle cyst excision under local anesthesia.

Specimen sent for histopathological examination which was suggestive of: microscopic examination of the biopsy specimen of fibrocollagenous tissue displaying cyst devoid of epithelium with lumen showing multiple sections of *Dirofilaria*. The surrounding stroma shows inflammation consisting of lymphocytes, plasma cells and histiocytes.

Occasional multinucleated giant cells seen. There is granulation tissue with capillary sized vessels. Patient was given antibiotics as per surgical prophylaxis. Patient is on regular follow up, no recurrence noted.



Figure 4: Microscopy: Sections show fibrocollagenous tissue displaying cyst devoid of epithelium with lumen showing multiple sections of *Dirofilaria*.

The surrounding stroma show inflammation consisting of lymphocytes, plasma cells and histiocytes. Occasional multinucleated giant cells seen. There is granulation tissue with capillary sized vessels.

DISCUSSION

HSD is a zoonotic filariasis caused by infection with several species of worms belonging to the genus *Dirofilaria*, with the most commonly seen species being, *Dirofilaria immitis* and *Dirofilaria repens*.¹ The infection is primarily asymptomatic in humans, who serve as the parasites' inadvertent dead-end hosts.⁴ *D. repens* is the most common cause of human dirofilariasis. *Dirofilaria* are natural parasites of a great variety of animals and, with the exception of *D. immitis*, live in the subcutaneous tissue of their hosts, produce circulating microfilariae, and are transmitted by mosquitoes. In mosquitoes, microfilariae mature into infective larval stages, which can be transmitted to a new host when a mosquito takes a blood meal. Depending on the etiological species and the affected body place,

dirofilariasis has different indications and symptoms. Approximately 1,782 human dirofilariasis cases have been reported, 372 of which were pulmonary and 1,410 of which were subcutaneous/ ocular cases. *Dirofilaria* is most commonly diagnosed in people by evaluating tissue from regions of inflammation in the lung or nodules under the skin. Finding mature worms in biopsy samples of subcutaneous nodules is often how subcutaneous dirofilariasis is diagnosed. The morphologic characteristics of the worms' cuticle, musculature, and lateral cords can aid in identifying the species causing the illness. *Dirofilaria* caused by *D. repens* can cause intermittent, painful erythema and itching as well as migrating subcutaneous lesions. Subcutaneous nodules due to dirofilariasis occur in exposed areas of the body such as face, orbits, upper limb, lower limb, chest wall and male genitalia. Effective therapy is possible by surgical removal of the adult worms and oral ivermectin plus diethylcarbamazine.⁵ Doxycycline has also been shown to be beneficial in treating filarial disorders including onchocerciasis and lymphatic filariasis by eradicating Wolbachia, resulting in a long-term decrease in microfilarial burdens.^{6,7} As part of a multimodal strategy, repellents/insecticides and macrocyclic lactone prevention can be used to prevent dirofilariasis.⁸ Diethylcarbamazine citrate has been shown to be an effective preventive therapy in dogs.

In humans, the definitive therapy for *Dirofilaria* infection is surgical excision of lung granulomas and nodules under the skin, which is also curative. In many circumstances, no medical therapy is required.⁹ In addition to surgical excision, several studies have shown that drugs such as doxycycline, ivermectin, and diethylcarbamazine (2 mg per kg t.i.d.) can successfully cure dirofilariasis.¹⁰ It is crucial to note, however, that practically all instances are identified only when histopathologic sections of biopsy or excised material are examined.

CONCLUSION

Humans with dirofilariasis may develop subcutaneous nodules. Patients exhibiting these symptoms should be evaluated for dirofilariasis, surgical excision is the only known modality of treatment. There is a need for increased awareness, diagnostic test and vector control. Early detection and treatment can help to avoid further complications and morbidity.

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