

# A Case of Paravertebral Swelling in a Toddler Turning Out to be a Parasitic Granuloma (Dirofilariasis)

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## ABSTRACT

**Background and aim:** Dirofilariasis is considered mainly as a zoonosis that may inadvertently cause disease in humans. Though there are many reports about different body locations for this parasitic infection, the subcutaneous involvement in the paravertebral region is mentioned in none. It could possibly cause diagnostic uncertainties when manifested in this particular area.

**Case description:** A 2-year-old male child presented with an asymptomatic swelling in his right lower thoracic paravertebral region for the last 6 months. Ultrasonogram done showed the presence of a worm in a subcutaneous hypoechoic nodule. The lesion was excised and the histopathology of the specimen was consistent with dirofilariasis.

**Conclusion:** Dirofilariasis should be thought of as a differential diagnosis in any case of subcutaneous paravertebral swelling.

**Clinical significance:** We projected this case to realize the possibility of occurrence of parasitic granuloma in this area of the body and the uncertainties it could create in the mind of a pediatrician.

**Keywords:** Dirofilariasis, Parasitic granuloma, Paravertebral region, Subcutaneous swelling.

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## BACKGROUND

Numerous animal parasites like protozoans, metazoans, and in particular helminths can cause granulomatous lesions in human beings.<sup>1</sup> Granulomas form as a result of a complex interplay between the invading organisms and the body immunity. They generally are protective mechanisms that form when the immune system cannot completely destroy an organism. Dirofilariasis is an infestation that can cause a parasitic granuloma when it infects our body. Dirofilarial worm affects mainly the eyes, lungs, and subcutaneous tissues in humans. It can cause subcutaneous lesions in the face, chest wall, upper arms, thighs, abdominal wall, and male genitalia. About 800 cases of dirofilariasis have been reported worldwide.<sup>2</sup> The age distribution of cases ranged from 1 to 65 years with a mean of 21.5 years.<sup>3</sup> Described cases are mostly from Southern and Eastern Europe, Sri Lanka, Italy, France, Greece, and Spain.

## CASE DESCRIPTION

A 2-year-old male child presented to the outpatient department with his mother complaining of a small swelling in his right paravertebral region of 6 months duration, she had accidentally noticed when her kid bent to his front during bathing. It was a small peanut-sized swelling that was not noticeable on direct observation but apparently getting visible only on bending. It had neither increased in size nor turned painful. No h/o fever, weight loss, lassitude, malaise or pallor for the child. No other swelling anywhere else in his body. The child had a normal appetite and activity. The swelling persisted and hence, out of anxiety, she took it to medical attention. Their home had a lot of mosquitoes breeding and stray dogs were there in plenty in the locality. No other person in the family had similar swelling. The child was normally developed and fully immunized. On examination, it

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was a subcutaneous defined cystic swelling 1 × 1 cm, mobile, non-tender mass in the right lower thoracic paravertebral region. There were no neurological deficits.

Blood test results were Hb-12.9, TC-11,800, PLC-3.31 L, P25 L47 E 21 M5, ultrasonogram right paravertebral region showed an ellipsoid well-circumscribed lesion measuring 8.5 × 2.5 mm located just deep to the deep muscular fascia and superficial to the paravertebral muscle. Curvilinear echogenic structures were seen within the lesion with no apparent movement which suggested a parasitic granuloma, possibly dirofilariasis. The child was posted for elective surgery later and the lesion was excised under general anesthesia and sent for histopathology. The histopathology section showed a fibrofatty tissue with intense inflammation rich in eosinophils and plasma cells with few foci of granulomas composed of epithelioid histiocytes. The cut section showed remnants of a worm with cuticle, muscles, and internal organelle within one of the granulomas. Significant degenerative changes were also observed. Morphological features of the dirofilarial worm were not well-preserved as a result of inflammation and degeneration.

## DISCUSSION

Dirofilariasis is a zoonotic infection caused by parasites of the genus *Dirofilaria*, family Onchocercidae, which belongs to the class of nematodes.<sup>4</sup> Two species are mostly of importance in human infections—they are *Dirofilaria repens* and *Dirofilaria immitis*. *Dirofilaria repens* mainly causes subcutaneous lesions, whereas *D. immitis* causes pulmonary lesions. It is mostly a disease affecting dogs and cats which is transmitted to humans through vectors, the most common being female mosquitoes. The adults of *D. repens* reside in the subcutaneous tissues of the dogs and cats. The female worm releases microfilariae into the circulation daily, which are ingested by the mosquitoes in a blood meal.<sup>5</sup> These infective larvae are injected as they bite humans. Most larvae thus injected are thought to perish. Humans are the dead-end host of *Dirofilaria*.<sup>6</sup> Subcutaneous dirofilariasis usually manifests as solitary nodules and the parasite usually locates close to the point of a mosquito bite.<sup>7</sup> The lesion could also be seen in deeper anatomical locations.

The more important risk factors for human infection are mosquito density, warm climate with extended mosquito breeding season, outdoor human activities, and the abundance of microfilaremic dogs. Due to relatively innocuous and minor lesions, only a little attention had been given to human subcutaneous dirofilariasis. However, the psychological anxiety it causes during an acute presentation could be immense, as it makes a diagnostic dilemma particularly as these lesions can be mistaken for benign or malignant tumors. In our case, the differential diagnosis included sympathetic nervous system tumors, soft tissue sarcomas, and vascular tumors. Should it be a lesion of the above categories, it would have made significant stress and anxiety to the parents and a challenging case for the treating physician, needing more invasive investigations like computed tomography (CT) and engaging more interdisciplinary teams.

Pediatricians must be familiar with this infestation and include it as a differential diagnosis in any subcutaneous nodules. As in this case report, eosinophilia is commonly seen with these infections. Peripheral blood eosinophilia and/or the presence of eosinophils in affected tissues suggest an allergic reaction caused by the inflammatory response induced by the nematode. Microfilaremia is rare in humans. Only a few reports of circulating microfilaremia in humans exist in the medical literature.<sup>8</sup> Ultrasonogram is of good use in the preliminary diagnosis of the lesion when the patient first presents. It usually reveals a worm appearing as a tubular structure inside a hypochoic subcutaneous nodule. Surgical excision of the lesion is the treatment of choice for dirofilariasis and is usually done as day-care. The precise identification of species may be achieved with DNA analysis based on polymerase chain reaction, but a large number of specific probes limits the usefulness of this method.<sup>9</sup>

## CONCLUSION

Additional anti-helminthic treatment was not required in our case. Anti-helminthic drugs are not indicated since *Dirofilaria* is reproductively inactive in the human host and has a single location. If secondary lesions are suspected or confirmed in deep body sites (e.g., thorax, abdomen), a course of ivermectin and diethylcarbamazine (DEC) may be advisable to avoid further invasive surgeries. In general, following diagnosis and resection of the lesion, the prognosis for patients is excellent. After removal of the parasite, eosinophilia usually returns to the normal range within a few months. Public awareness about the transmission of this worm helps and exposure to mosquitoes should be minimized as much as possible. Limiting canine and feline dirofilariasis by chemotherapy or prophylaxis and reduction of vector population are mandatory measures in combating the rise of human dirofilariasis.

## CLINICAL SIGNIFICANCE

Subcutaneous dirofilariasis in the paravertebral region could cause clinical doubts in children on initial presentation, as no medical literature has so far mentioned this site to get involved in the infection. Pediatricians should consider dirofilariasis also if the lesion appears to be a solitary one with no tissue extension.

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