

# DIROFILARIA INFECTION IN THE BREAST OF A WOMAN IN JAPAN

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## INTRODUCTION

Human infections with the dog heartworm, *Dirofilaria immitis*, have been reported from various parts of the world. In the majority of these cases, however, the parasite was found in the lung, heart and various portions of subcutis (Beaver and Orihel, 1965; Yoshimura, 1985). There is only a report of *D. immitis* infection in the breast (Kaneda *et al.*, 1980). Recently, we found a case of *D. immitis* infection in the breast of a woman. The pathological and parasitological findings obtained are reported herein.

## Case report

A 37 year-old woman, Y.M., residing in Kumamoto Prefecture, Japan, visited the hospital due to the suspected diagnosis of malignant tumor in the breast. An inflammatory nodule ( $0.7 \times 0.7 \times 0.7$  cm) was surgically excised and was histologically examined. It revealed the presence of sectioned nematode in the center.

**Histology and parasite:** The section of the nodule revealed the following construction: The cross sections of a worm were found in the center of the necrotic inflammatory lesion, and the surrounding layer was composed of granulomatous tissues with various kinds of inflammatory cells, predominant cells being eosinophils and lymphoid cells (Fig. 1). The outer boundary of the granulomatous inflammation was not so clearly distinguished from the adjacent tissue of the mammary gland, but there were relatively new allergic inflammation with arteritis and other vascu-

litis accompanied with thickening of vessel walls (Fig. 2). The diameter of the transverse section of the worm was about 75  $\mu$ m (Figs. 3, 4). The thickness of the cuticle which was composed of 3 layers was 2  $\mu$ m. The outer cuticular surface was smooth and was not provided with any ridges or projections. In the cross and longitudinal sections, fine transverse striations of the inner layer of the cuticle were seen. The innermost layer of one had a pair of longitudinal ridges in the region of the lateral chords (Figs. 3', 4'). The muscle cells were of the high coelomyarian type and extended to the center. In the center of the worm section, there were two reproductive ducts containing many oogonial cells, measuring 25  $\mu$ m at the maximum diameter, and intestinal tube, 15  $\mu$ m (Figs. 3, 4).

## DISCUSSION

Recently, the number of reported cases of human dirofilariasis have been increasing (Beaver and Orihel, 1965; Yoshimura, 1985). However, there has been no report of *D. immitis* infection in the breast except one case (Kaneda *et al.*, 1980), in spite of the many reported cases of *Wuchereria bancrofti* in the breast (Gupta, 1964; Saxena *et al.*, 1975; Chen and Xie, 1981).

In this case, the pathological reaction to the worm was a severe allergic inflammation with arteritis and a new atypical granulation. On the other hand, *Wuchereria bancrofti* mainly exists in the lymphatic vessel, and causes lymphangitis and lymphadenitis in the breast (Chen and Xie, 1981).

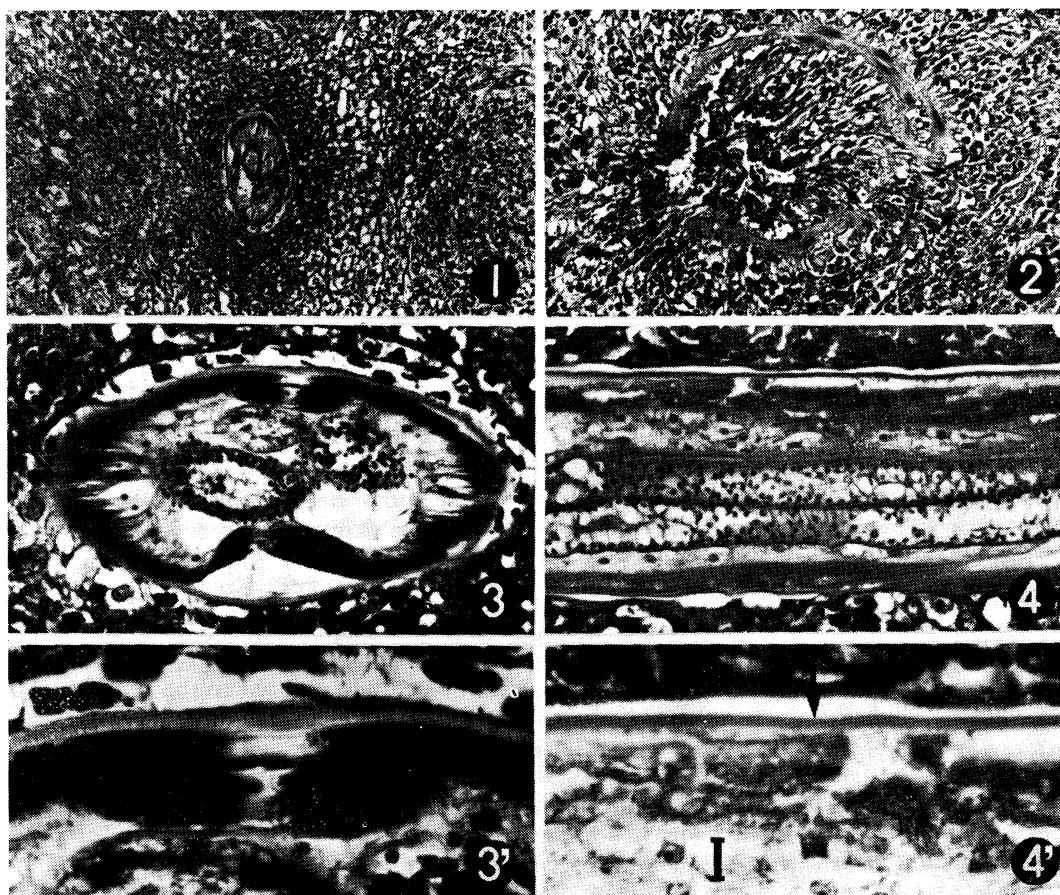


Fig. 1 — The worm found in the necrotic inflammatory lesion with abundant eosinophils. Hematoxylin eosin (HE) stain.  $\times 100$ .

Fig. 2 — Arteritis with the thickening of the wall in the inflammatory lesion. HE.  $\times 150$ .

Fig. 3 — The cross section of the worm. Masson stain.  $\times 400$ .

Fig. 3' — The region of the lateral chord of worm in the cross section. Masson.  $\times 1,200$ .

Fig. 4 — The longitudinal section of worm. HE.  $\times 400$ .

Fig. 4' — The cuticle (arrow) of the worm in the longitudinal section. I — intestine. HE. 1,200.

According to the morphologic criteria for the identification, the cuticle of *D. immitis* is composed of 3-4 layers, and shows the presence of transverse striations in the cross section of the worm (Beaver and Orihel, 1965; Ohmori *et al.*, 1977). As to the thickness of the cuticle, there are various values, for example 7  $\mu\text{m}$  or less (Ohmori *et al.*, 1977), 22  $\mu\text{m}$  (Tada *et al.*, 1979) and up to 33  $\mu\text{m}$  (Moorhouse *et al.*, 1971). According to the scanning electron microscopic observation of five *Dirofilaria* species (Wong and Brummer,

1978), the longitudinal ridges on the outer surface of cuticle was found in four species (*D. repens*, *D. tenuis*, *D. corynodes* and *D. magnilavatum*), of the subgenus *Nochtiella*. However, no ridges were observed in *D. immitis* except at the coiled terminal portion of the male. The transverse striations of the body wall of *Dirofilaria* were found in the cross sections (Beaver and Orihel, 1965; Ohmori *et al.*, 1977) and longitudinal sections (Tada *et al.*, 1979; Kagei *et al.*, 1985), while these striations were not found in the cuticle

of *Wuchereria* (Yoshimura *et al.*, 1981). The internal ridges of the cuticle of *D. immitis* were relatively prominent at the lateral chord positions, compared with the flat one in *Wuchereria* (Ohmori *et al.*, 1977; Yoshimura *et al.*, 1981). Moreover, the muscle cell of *D. immitis* was the high coelomyarin type (Chitwood and Lichtenfels, 1972; Tada *et al.*, 1979). The morphological features of the present worm apparently satisfy the above criteria for *D. immitis*. However, the diameter of worm was very small compared with those described previously (Chitwood and Lichtenfels, 1972; Ohmori *et al.*, 1977; Tada *et al.*, 1979), probably because of the immaturity. Based on these features, the present worm was identified as an immature female *Dirofilaria*, possibly *D. immitis*.

#### SUMMARY

*Dirofilaria* infection in the breast of a woman was reported from Japan. A nodule in the breast was excised and histologically examined. The sections of a female nematode were found in the center of the nodule. Based on the morphological features of this worm, it is suggested that this may represent the second human case of *Dirofilaria immitis* occurring in the breast.

#### ACKNOWLEDGEMENTS

The authors are grateful to Dr. Nobuaki Akao of the Department of Parasitology, School of Medicine, Kanazawa University for his kind suggestion.

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