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Research Note

Cutaneous Paragonimiasis — A Case Report —

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Paragonimus westermani is principally a parasite of the lung of mammals including man. This parasite often causes an ectopic infection in various organs such as peritoneal cavity, pleural cavity, diaphragm, liver, brain, etc. Cutaneous paragonimiasis is well-known from earlier times as one of typical form of ectopic infections and a few cases were found in Taiwan, Korea, and also in the endemic area in Japan (rev. by Yokogawa *et al.*, 1960). Recently, however, such ectopic paragonimiasis cases are rare in parallel with the decrease in number of human paragonimiasis cases in general. So far we could gather, the last report of cutaneous paragonimiasis is that by Suzuki *et al.* (1978). Here we report a case of cutaneous paragonimiasis westermani found in Miyazaki Prefecture.

A 56-year-old female farmer presented to the Department of Dermatology, Miyazaki Medical College on the 30th June 1989 because of mobile local swelling on the right lateral abdominal wall. She stated that on the 20th May 1989 she first noted a induration on the right upper abdominal wall which gradually moved downwards over a month period. She sometimes cooks fresh-water crab, *Eriocheir japonicus.* She also had eaten raw, sliced meat of wild boars on Jan. 1989.

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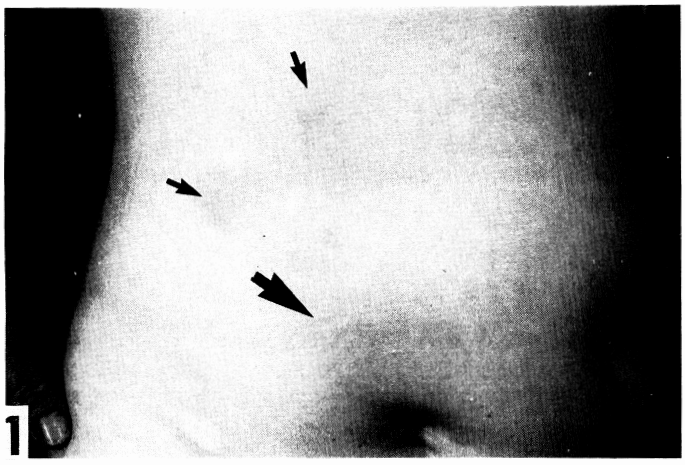
On her right abdominal wall were seen two pigmented spots and a induration with redness (Fig. 1). By laboratory examination, WBC count was 6,800 with 26% eosinophils. Serum total IgE was 671.5 IU/ml. Liver function was normal. Chest X-ray was normal. Immediate type skin reaction against *Gnathostoma doloresi* was negative.

On the 6th July 1989 the indurated lesion was extirpated. When this mass was cut open, a living worm was found in the indurated subcutaneous fat tissue (Fig. 2). The worm was ovoidal shape (about 3 × 1.5 mm), had reddish-brown hue, and crowled around slowly when it was placed in physiological saline solution (Fig. 3). Its movement was recorded in video-film and microcinematograph. Under a dissecting microscope, oral and ventral suckers of about the same size were noted. The worm was then gently flattened between slide glasses, fixed in 10% formalin, stained with Borax-Carmin, dehydrated in an ascending series of ethanol, cleared in Hemo-D, and mounted (Fig. 4). Unfortunately the latter half of the parasite was damaged by manipulation during recording of the movement so that gonadal organs were not clearly identified. Oral and ventral suckers were identifiable. Eggs were not found in the worm body, indicating that the parasite was immature. In addition to the morphological characteristics of the parasite, the patient's serum gave a clear precipitin bands against *P. westermani* and *P. miyazakii* antigens by an Ouchterlony's double diffusion test with the dominance against *P. westermani* antigen (Fig. 5). Furthermore, immediate type skin test



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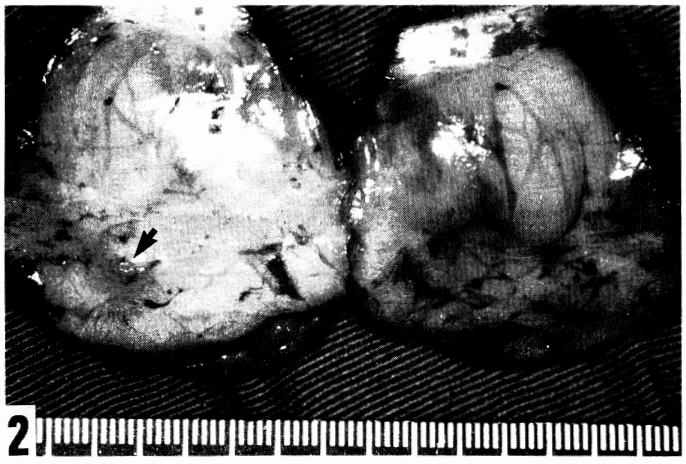

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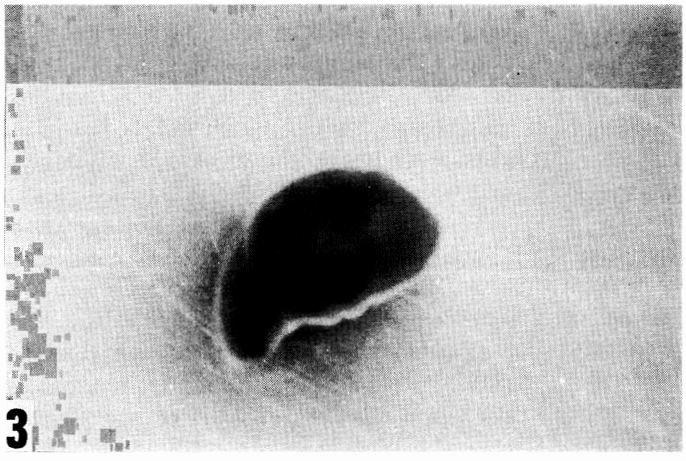

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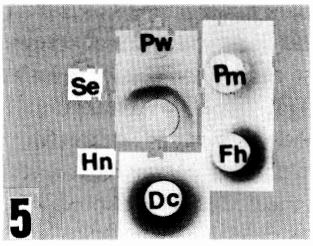

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performed one week after surgery gave strong positive reaction (wheel: 19 × 12 mm, erythema: 65 × 55 mm) against *P. westermani* antigen. From these results, the parasite was identified as *P. westermani*. Histopathologically massive eosinophil infiltration and fat necrosis were seen around the infected site.

Miyazaki Prefecture has long been known as an endemic area of paragonimiasis westermani. Even nowadays human paragonimiasis cases are occasionally seen in this area (unpublished data). As the source of infection to human, fresh-water crab, *E. japonicus,* which is the second intermediate host of *P. westermani* in Miyazaki Prefecture, is important because people in this area often cook and eat crab-soup. In addition, in Miyazaki Prefecture people have a habit of eating raw sliced meat of wild boars which is known as a paratenic host of *P. westermani* (Miyazaki and Hirose, 1976). In the present case the patient has a past history of eating both sources so that the actual source of infection was not identified.

In terms of clinical manifestation, the patient reported here showed mobile swelling on the abdominal wall. Such a symptom can be seen not only in paragonimiasis but also in other parasitic diseases (Katagiri and Hirano, 1956) such as gnathostomiasis or sparganosis both of which are endemic in Miyazaki Prefecture (for gnathostomiasis, Nawa *et al.*, 1989; for sparganosis, unpublished data). Thus, if the parasites were not detected in the skin lesion, immuno-serological examination is critically important for the differential diagnosis. In the present study, fortunately a whole living worm was dissected out from the indurated lesion. Furthermore, immuno-diagnosis using an Ouchterlony's test and also immediate type skin test gave a positive result against *P. westermani* antigen.

The patient reported here had no abnormalities in the lung by chest X-ray. Although Yamaguchi *et al.* (1958) pointed out that cutaneous paragonimiasis was almost exclusively accompanied by pulmonary lesions, a case of cutaneous paragonimiasis withuot lung lesion was already reported by Miyazato *et al.* (1961). Thus, ectopic infection in the skin could occur before the parasites reach the lung. As the route of migration of *P. westermani,* involvement of abdominal wall was experimentally demonstrated by Yokogawa *et al.* (1962). After penetration into muscular tissues in the abdominal wall, immature worms may accidentally migrate into neighboring subcutaneous connective tissue to cause cutaneous paragonimiasis.

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Fig. 1. Skin lesions seen on the patient's right abdominal wall.
Small arrows: pigmentation
Large arrow: induration with redness

Fig. 2. Cut surface of the indurated tissue.
The parasite is indicated by an arrow.

Fig. 3. Fresh parasite in saline.

Fig. 4. Permanent preparation of the parasite.
OS: oral sucker
VS: ventral sucker
Scale bar: 1 mm

Fig. 5. Ouchterlony's double diffusion test in agarose
Pw: *Paragonimus westermani*
Pm: *Paragonimus miyazakii*
Fh: *Fasciola hepatica*
Dc: *Dipylidium caninum*
Hn: *Hymenolepis nana*
Se: *Spirometra erinacei*
Center well: patient's serum

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