

## A human case of gastric anisakiasis by *Pseudoterranova decipiens* larva

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**Abstract:** A case of gastric anisakiasis due to the larva of *Pseudoterranova decipiens* was confirmed by gastroendoscopic examination in April 23, 1991. The patient, residing in Pusan, was a 42-year-old housewife, who complained of severe epigastric pain and recalled that the symptom suddenly attacked her about 6 hours after eating raw *Sebastes inermis*. In the gastroendoscopic examination performed about 9 hours after the onset of the symptom, a long whitish nematode larva penetrating the gastric mucosa in the greater curvature of mid-body was found and removed with a biopsy forcep. The nematode was 29.73 × 0.94 mm in size, had an intestinal cecum reaching over mid-level of the ventriculus and was identified as the 4th stage larva of *P. decipiens*.

**Key words:** Human case, gastric anisakiasis, *Pseudoterranova decipiens* larva

### INTRODUCTION

Anisakiasis is a broad sense of diseases caused by the infection of anisakid larvae, i.e. *Anisakis* type I and type II, *Pseudoterranova* type A and *Contracaecum* sp. larva. Strictly speaking, it is restricted to the infection by the larvae of *Anisakis simplex* and *A. physeteris*, the ascarid of whales. On the other hand, that by the larva of *Pseudoterranova decipiens*, the ascarid of seal and fur seal, is recently called as pseudoterranoviasis or the codworm anisakiasis (Ishikura and Namiki, 1989; Chal, 1990).

Since the first human case of anisakiasis was reported in Korea (Kim *et al.*, 1971), numerous cases have been presented by many workers. Most of Korean anisakiasis cases were found infected with the larvae of the genus *Anisakis*. Only six were identified as

infections by *Pseudoterranova* type A larva which has been confirmed as the larva of *P. decipiens* (Seo *et al.*, 1984; Lee *et al.*, 1985; Im *et al.*, 1990; Im and Shin, 1991). The authors have also experienced a case of gastric disorder caused by a larva of *P. decipiens*. The present paper deals with the clinical features of the patient and the morphological characteristics of the worm obtained.

### CASE DESCRIPTION

A 42-year-old housewife, residing in Pusan, was admitted to Department of Internal Medicine, College of Medicine, Inje University, Pusan Paik Hospital in April 23, 1991. She chiefly complained of severe epigastric pain and recalled that the pain suddenly attacked her about 6 hours after eating of raw flesh of *Sebastes inermis*. A total blood count, corpuscular hemoglobin, chemical examination of blood and the urinalysis on the patient were all normal. In the gastroendoscopic examination performed about 9 hours after the

• Received Jan. 3 1994 and accepted after revision Feb. 25 1994.

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onset of symptom, a long whitish nematode larva penetrating the gastric mucosa was found in the greater curvature of mid-body (Fig. 1).

### MORPHOLOGY OF THE REMOVED WORM

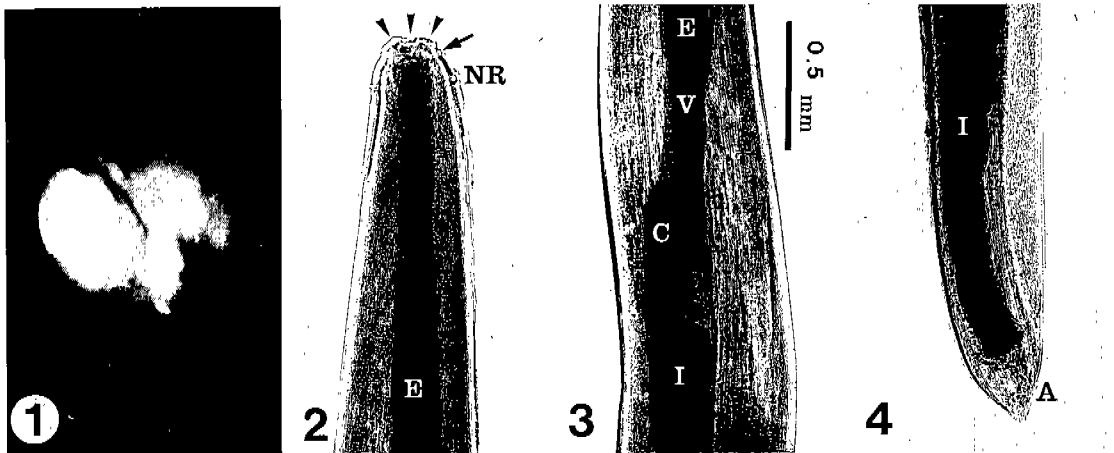
The worm taken out with a biopsy forceps was still moving in 0.85% saline. This worm was fixed with 10% formalin, cleared in glycerine alcohol, mounted with glycerine-jelly and observed under the light microscope with micrometer. The nematode larva was 29.73 mm in length and 0.94 mm in maximum width. The mouth was surrounded by 3 lips and the boring tooth was lacking. An excretory pore opened between two subventral lips. A nerve ring was found at 0.23 mm from the anterior end (Fig. 2). A ventriculus (1.02 mm long) was observed between the well-developed muscular esophagus (2.35 mm long) and intestine, and its appendage was not found. An intestinal cecum (0.65 mm long) was stretched anteriorly to the level of anterior one-third portion of ventriculus (Fig. 3). The tail (0.13 mm long) was conical without the mucron (Fig. 4). The reproductive organs were not seen to be developed. The cuticle was transversely striated. The measurements and indices of the

worm are showed in Table 1.

### DISCUSSION

Human infection by *Pseudoterranova* larva, the codworm anisakiasis, was first reported in Japan by Suzuki *et al.* (1972). Thereafter hundreds cases of anisakiasis caused by *Pseudoterranova* larvae were chiefly reported in the northern part of Japan. The proportion of the cases attributed to *Pseudoterranova* larvae in Hokkaido is 30-35%. However, the codworm anisakiasis cases are a small number in comparison with all anisakiasis cases reported in Japan (Asaishi *et al.*, 1989). On the other hand, 16 ones (67.0%) out of 24 anisakiasis cases reported in the United States were found to be due to *Pseudoterranova* larvae (Desowitz, 1986). In Korea, only 6 ones out of 158 anisakiasis cases reported in the Korean literatures were confirmed to be due to *Pseudoterranova* type A larvae (Seo *et al.*, 1984; Lee *et al.*, 1985; Im *et al.*, 1990; Im and Shin, 1991). Accordingly, present case may be the 7th case of codworm anisakiasis in Korea.

As the fish host of *Pseudoterranova* type A larva, 9 kinds of marine fish including cod, pollack and turbot have been reported in Japan (Ishikura, 1989). However, there has



**Fig. 1.** Gastroendoscopic view of present case showing a long whitish larva penetrating the gastric mucosal fold in the greater curvature of mid-body. **Fig. 2.** Anterior portion of *Pseudoterranova decipiens* larva showing 3 lips (arrow heads) without a boring tooth, an excretory pore (arrow mark), a nerve ring (NR) and the muscular esophagus (E). **Fig. 3.** Ventricular level of present worm showing esophagus (E), ventriculus (V) intestine (I) and intestinal cecum (C) reaching over mid-level of ventriculus. **Fig. 4.** Posterior portion of present worm showing the intestine (I) and anus (A) but no mucron at posterior end.

**Table 1.** Measurements\* and indices of *Pseudoterranova decipiens* larva in comparison with those of previous authors

Items	Present study	Seo <i>et al.</i> (1984)	Koyama <i>et al.</i> (1969)
Body length (L)	29.73	25.76	24.2 (11.0-37.2)
Body width (W)	0.94	0.66	0.57 (0.30-0.95)
Esophagus (E)	3.37	2.99	2.54 (1.67-3.50)
Muscular part (M)	2.35	2.01	1.68 (1.04-2.40)
Ventriculus (V)	1.02	0.98	0.87 (0.06-1.10)
Tail (T)	0.13	0.12	0.11 (0.08-0.14)
Cecum (C)	0.65	0.73	0.55 (0.27-1.01)
Indices			
$\alpha$ (L/W)	31.63	39.03	42.5 (31.1-48.0)
$\beta_1$ (L/E)	8.82	8.62	9.2 (6.59-11.52)
$\beta_2$ (L/M)	12.65	12.82	14.4 (10.6-18.2)
$\beta_3$ (L/V)	29.15	26.29	27.9 (17.5-33.8)
$\gamma$ (L/T)	228.69	214.69	220.0(122.2-372)
W (V/C)	1.57	1.34	1.67 (1.09-2.33)
Y (L/C)	45.73	35.29	44.0 (31.8-68.4)

\*Unit is mm.

been no report on the fish host of *Pseudoterranova* type A larva in Korea, although several kinds of anisakid larvae such as *Anisakis* type I, *Raphidascaris* sp. and some types of *Contracaecum* larvae were recovered from *Pseudotseudiosciaena manchurica* and *Astroconger myrtaster* (Chai *et al.*, 1986 & 1990). And then it is supposed that the investigation on the fish host of *Terranova* larvae will be made.

The identification of anisakid larvae is made on the basis of their esophagointestinal morphology and measurements (Koyama *et al.*, 1969). The present larva was distinguished from *Anisakis*, *Raphidascaris* and *Contracaecum* spp. larvae by means of the characteristic features such as no ventricular appendage and the presence of intestinal cecum. This worm has a cecum reaching to anterior one-third level of ventriculus and the body length of 29.73 mm, which are compatible with *Pseudoterranova* type A larva. The other morphological features of present worm *i.e.* the well-defined lips, the absence of boring tooth at the anterior end and the mucron at the posterior end and the appearance of regular transverse striations on the cuticle (Ishii *et al.*, 1989), suggested that this larva has been molted in the stomach of patient and grown up the 4th stage one.

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=국문초록=

### *Pseudoterranova decipiens*의 유충에 의한 위 아니사키스증 1례

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1991년 4월 23일에 심한 상복부통을 주소로 부산 백병원 내과를 찾아온 42세 가정주부에 대한 내시경 검사에서 위벽을 뚫고 있는 아니사키스 유충 1마리를 검출하였다. 환자는 내원 약 15시간 전에 우럭 회를 먹은 경험이 있었으며 회를 먹고 약 6시간 후부터 심한 상복부통이 나타났다고 하였다. 각종 검사상 특이 소견은 없었고 위 내시경 검사에서 위체 대만부 중간부위의 점막을 뚫고 있는 아니사키스 유충 1마리를 발견하여 제거하였다. 제거한 총체는 29.73 x 0.94 mm 크기이었고 ventriculus 전방 1/2 이상 부위까지 올라오는 맹장을 가지고 있었으며 ventricular appendage는 관찰되지 않았다. 총체의 전단에서 윤곽이 뚜렷한 3개의 구순은 관찰되었으나 boring tooth는 존재하지 않았고 후단에서 mucron도 관찰되지 않았다. 이상의 형태학적 특징 및 계측치를 토대로 하여 *Pseudoterranova decipiens* (= *Terranova* type A) 제4기 유충인 것으로 동정하였다. 이 기생충의 국명을 불개회충으로 제안한다.

[기생충학잡지 32(1): 53-56, 1994년 3월]