

The First Case of Diplogonoporiasis in Chiba Prefecture, Japan

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Introduction

Diplogonoporiasis was first described by Iijima and Kurimoto (1894). Suzuki *et al.* (1985) reviewed 99 cases in Japan from 1894 to 1984. According to them, this disease is found from Kanagawa Prefecture through western Japan.

In this paper, we report the first case of diplogonoporiasis in Chiba Prefecture in eastern Japan.

Case Report

A 50-year-old man was admitted to the hospital on December 8, 1984, because of diarrhea containing worm fragments. He was a fisherman and raw marine fish made up a great portion of his diet. He was without complaints until two days previously, when diarrhea and abdominal pain began. One day before admission he found worm fragments totaling a length of about 3 m in his feces.

The patient's temperature remained within normal range. The head and neck were normal, and the lungs were clear. The heart was normal. The liver and spleen were not felt and no mass or costovertebral-angle tenderness was found. Examination of the abdomen showed neither tender, firm nor rebound tender areas. Hematological values were as follows: hematocrit

50.6 per cent, red blood cell count 5,420,000, hemoglobin value 16.7 g/100 ml, and white-cell count 9,100. The blood picture was not examined. Liver function tests were all within normal limits. Serum electrolyte values showed sodium 149 mEq/L, potassium 4.0 mEq/L, and chloride 114 mEq/L. Urinalysis failed to reveal any abnormalities. A stool examination revealed neither ova nor parasites.

On the 5th hospital day the patient was orally administered bithionol, 30 mg/kg, followed by magnesium sulfate as a laxative. Worm fragments were discharged 3 hrs later. On the next day the patient left the hospital.

Description of the parasite

Three pieces of strobilae, which had been fixed in 10% formaldehyde, were examined in our laboratory.

One strobila, found in the feces before admission, was 10 cm in length, 7 mm in width. Another two, taken after medication, were 18 cm and 15 cm long and 2 mm and 1.5 mm wide, respectively. The strobilae consisted of numerous segments, which were greatly wider than long. The former was again fixed in 10% formaldehyde. A part of it was pressed and stained with carmine for morphological examination. The remaining was embedded in paraffin for light microscopy. The sections were stained with hematoxylin and eosin or with Masson's trichrome. Two immature genital organs are found in each segment (Figs.

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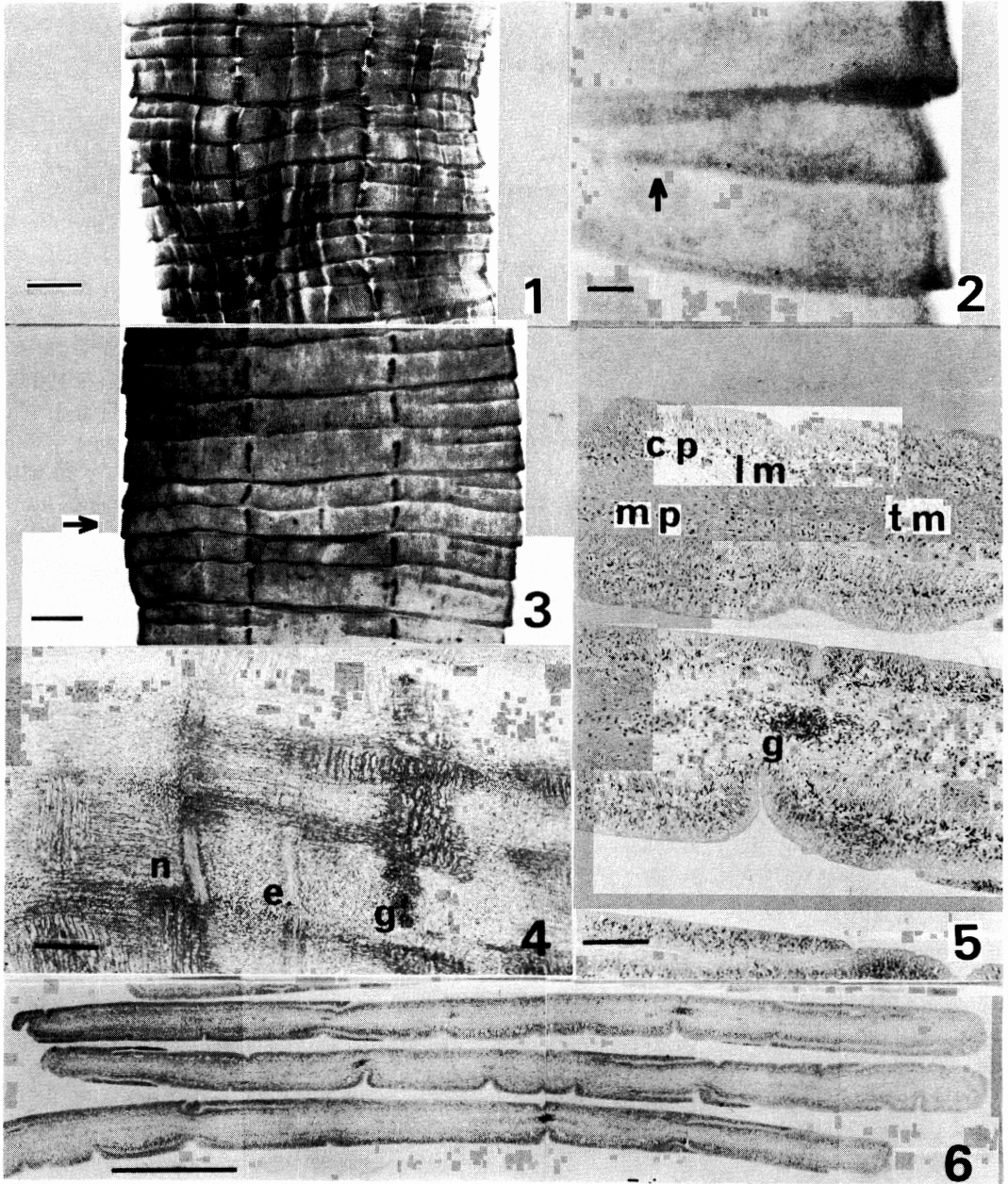


Fig. 1 The specimen discharged before therapy (scale = 1.0 mm).
 Fig. 2 Incomplete transverse division, shown by arrow (scale = 0.1 mm).
 Fig. 3 The pressed specimen. The arrow shows the segment which has 3 genital primordia (scale = 1.0 mm).
 Fig. 4 Horizontal section of the segments (scale = 0.4 mm).
 Fig. 5 Transverse sections of the segment (scale = 0.1 mm).
 Fig. 6 Transverse sections of the segment (scale = 1.0 mm), showing sulci on the surface of the worm.

Abbreviations: cp; cortical parenchyma, e; excretory canal, g; genital primordium, lm; longitudinal muscle, mp; medullary parenchyma, n; nerve trunk, tm; transverse muscle.

1 and 3). An extra immature genital organ is sometimes present between them (Fig. 3). Incomplete transverse divisions are observed in some segments (Fig. 2). The measurements of segments are 0.55–1.15 mm (mean 0.96 mm) in length, 6.79–7.95 mm (mean 7.27 mm) in width, and 0.20–0.37 mm in thickness. In the transverse section, there are one pair of nerve trunk and excretory canal (Fig. 4). The longitudinal muscle layer is 52.8 μm and the transverse muscle layer is 16.8 μm (Fig. 5). Distance between genital primordia is 2.92 mm.

The scolex is not found in the strobilae taken after medication. These 3 strobilae are thought to be derived from the same tapeworm.

The tapeworm is different from *Diplogonoporus fukuokaensis* (Kamo and Miyazaki, 1970) in the following morphological characters. No longitudinal muscle fibers are found between genital primordia and the distance between them in this tapeworm occupies about 40% of width of the segment:

Based on these observations, the parasite is identified to be immature tapeworm, *Diplogonoporus grandis* (Blanchard, 1894).

Comments

Diplogonoporiasis has been reported in 99 cases in Japan until 1984 (Suzuki *et al.*, 1985). Thereafter, some other cases were reported (Miyahara and Maejima, 1985; Kagei, 1986). However, all of these cases were distributed to the west of Kanagawa Prefecture (Fujisawa and Kaneko, 1957; Kagei *et al.*, 1981; Oshima and Amano, 1985), and especially in Nagasaki, Kochi, Tottori and Shizuoka Prefectures, Japan. Some marine fish, such as the sardine, are suspected as the source of infection, and these areas are the center of the coast fishing industry for such fish. Choshi in Chiba Prefecture in the east of the Kanto district is also an important sardine fishing area in Japan. The patient in this report usually eats raw seafood. Therefore, the source of his infection can be assumed to originate from that portion of his

diet, although it can not be determined whether the source was the sardine or not. The outbreak of this disease has been reported mostly in spring (Kamo *et al.*, 1971; Suzuki *et al.*, 1985). The present patient had an abrupt onset of the disease in winter.

The geographical and the seasonal distributions of diplogonoporiasis may suggest the source of the infection.

The symptoms of diplogonoporiasis are diarrhea, abdominal pain, nausea and loss of appetite (Kamo *et al.*, 1971; Suzuki *et al.*, 1985), and our patient complained of the same symptoms. The hematological values of hemoglobin, hematocrit and red blood cell count were revealed slightly high, probably because of hemoconcentration due to diarrhea. His serum electrolyte values were also high.

Although the scolex could not be found, treatment with bithionol was probably effective in this case, because the patient did not come again to the hospital since then.

As compared with other immature worms which have already been reported, the one in the present paper is very thin and slightly long. Maejima *et al.* (1969) reported a parasite like this. They assumed that the worm had been pressed and stretched by some environmental factors. In this case, we have no information about how the tapeworm was preserved before our examination.

There may be other such cases in the Choshi area of Chiba Prefecture. In any event, clinicians and medical technicians are not well informed about this disease as yet. This disease seems to require more of our attention.

Summary

The first case of diplogonoporiasis in Chiba Prefecture, Japan is reported. The patient is a fisherman and usually eats raw seafood. He was admitted to the hospital on December 8, 1984, because of diarrhea with pieces of a tapeworm. On the 5th hospital day, the patient was treated with bithionol and the worm was discharged. However, the scolex was not found.

The worm consisted of numerous segments, which were greatly wider than long. Each segment had two immature genital organs. Some of them had an extra one. Incomplete transverse divisions were observed in some segments. A pair of excretory canal and nerve trunk were found in the transverse sections. Distance between genital primordia of the worm occupied about 40% of width of the segment. Based on these observations, the parasite was identified as immature tapeworm, *Diplogonoporus grandis*.

This case indicates that diplogonoporiasis is also found in the eastern part of Japan from Kanagawa Prefecture.

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大複殖門条虫症の千葉県第1例

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千葉県における大複殖門条虫症の第1例を報告した。患者は漁業に従事しており、海産魚類を好んで生食していた。生来健康であったが、突然の下痢とともに虫体の排泄があり昭和59年12月8日、近医受診し入院となった。ピチオノールで駆虫を行い、条虫の排泄を認めたが頭節は確認できなかった。

各片節は2個の生殖原基を持ち、一部の片節には3個の生殖原基を認めた。片節の中にはさらに横に

分節を形成する像がみられた。切片標本では一對の排泄管と神経幹が認められた。2個の生殖原基間の距離は片節の幅の約40%を占めており、2個の生殖器がきわめて接近している福岡複殖門条虫とは明らかに異なるものであった。以上より大複殖門条虫の未熟虫体と同定した。

本症例は、神奈川県以東でも本症が存在することを示している。