

## The first human case of *Clinostomum complanatum* (Trematoda: Clinostomidae) infection in Korea

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**Abstract:** The authors present the first human case of *Clinostomum* pharyngitis in Taegu, Korea. The patient was a 56-year old male who visited an otolaryngology clinic due to foreign body sensation and pain of the pharyngeal region for 3-4 days. He used to eat raw fresh-water fish. Otolaryngological examinations revealed a living worm adhered to the right posterior pharyngeal wall. The worm removed was identified as *C. complanatum* after morphological observations. It is likely that more attention should be paid to eating raw fresh-water fish in Korea with regards to *Clinostomum* pharyngitis.

**Key words:** *Clinostomum complanatum*, pharyngitis, raw fresh-water fish, human case, Korea

### INTRODUCTION

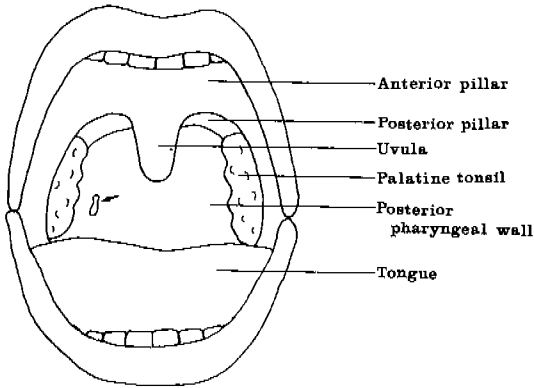
*Clinostomum complanatum* (Rudolphi, 1814) parasitizes the throat and esophagus of piscivorous birds belonging to the families Ardeidae, Accipitridae, Laridae, Fregatidae and Phalacrocoracidae (Yamaguti, 1958). *Clinostomum*, like *Fasciola* and pentastomes, has also been known to cause a clinical syndrome called halzoun or marrara. Human infection by *Clinostomum* is very rare and known to result from eating raw fresh-water fish such as carp, *Cyprinus carpio*, and crucian carp, *Carassius auratus*. Some of Koreans, especially living near rivers or ponds, enjoy eating fresh-water fish raw. However, to the best of our knowledge, no human case of *Clinostomum* infection has been reported in Korea. The present authors report the first human case of *Clinostomum* pharyngitis in Korea.

### CASE RECORD

The patient, a 56-year-old Korean male, lives in Taegu, Korea and used to go fishing in the vicinity of Taegu-shi, Korea. He had eaten several kinds of fresh-water fish he caught. The patient visited a local otolaryngology clinic in Taegu, May, 1994, due to the irritation and painful sensation in the pharyngeal region for 3-4 days after eating raw fresh-water fish. He was quite healthy besides the symptoms. Otolaryngological examination revealed a living worm adhered to the right side of the posterior pharyngeal wall at the mid-tonsillar level, which was surrounded by a hyperemic area (Fig. 1). The results of laboratory examinations were within normal ranges. The worm was removed and transferred to the Department of Parasitology, Kyungpook National University School of Medicine. No remarkable injury was found on the attachment site of the mucous membrane. After removal of the worm, the symptoms and signs in the pharynx were relieved.

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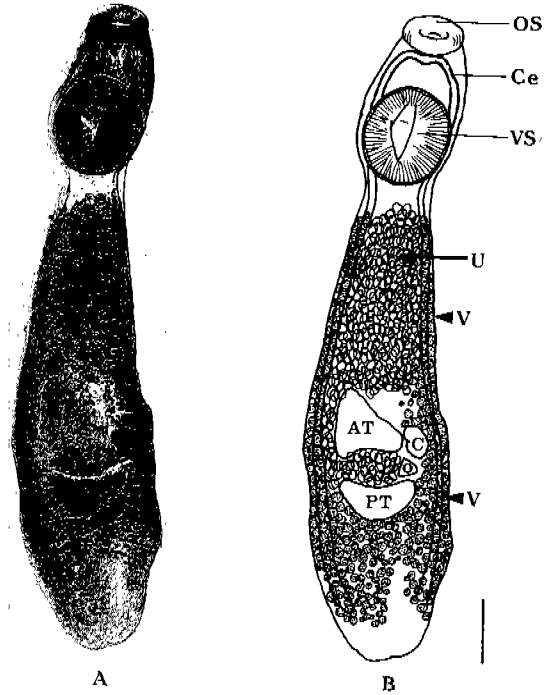
\* Corresponding author



**Fig. 1.** Oral cavity showing location of the worm (arrow) adhered to the right posterior pharyngeal wall.

### DESCRIPTION OF PARASITE

The worm was fixed in 10% formalin and subjected to the pressed preparation, and then stained by Semichon's acetocarmine (Fig. 2). The measurements and morphology of the specimen are as follows: Body, linguiform, is 4.74 mm in length, 1.05 mm in maximum width at the posterior one third of the body. No tegumental spine is noticed by a light microscope. Oral sucker, surrounded by collar-like fold, is more or less transverse,  $0.29 \times 0.43$  mm, and subterminal. The pharynx and esophagus are obscure in the present specimen. Ceca are bifurcated at immediately posterior margin of oral sucker, and directed posteriorly. Acetabulum,  $0.72 \times 0.64$  mm, is situated in the anterior one fifth. Its orifice is longitudinally elongated. Testes are separated by uterus. Anterior testis is triangular and situated in the anterior part of middle one third, measuring  $0.53 \times 0.51$  mm. Posterior testis, crescentic and superiorly concave, is located in the anterior part of the posterior one third,  $0.35 \times 0.55$  mm. Ovary, triangular,  $0.15 \times 0.12$  mm, is placed between the two testes, apart from median line. Cirrus pouch, oval,  $0.29 \times 0.16$  mm, is situated anterolaterally to the ovary. Uterus is coiled between the postacetabular area and posterior testis. Vitellaria are distributed from the postacetabular level to the caudal end of the body along the lateral margins. Eggs measured  $101-123 \times 63-83 \mu\text{m}$ , with an operculum 22-



**Fig. 2.** *Clinostomum complanatum* obtained from pharyngeal wall. A. Photomicrograph of the stained specimen (ventral). B. Drawing of A (AT: anterior testis; C: cirrus; Ce: ceca; O: ovary; OS: oral sucker; PT: posterior testis; U: uterus; V: vitellaria; VS: ventral sucker). Scale bar = 0.5 mm.

27  $\mu\text{m}$  wide. The excretory bladder in the stained specimen was unclear. The worm examined was identified as *C. complanatum*. In comparison with the measurements of the flukes reported previously, the present specimen looks somewhat slender (Table 1).

### DISCUSSION

The present specimen was identified as *Clinostomum complanatum*. The flukes belonging to the genus *Clinostomum* have been debatable in their taxonomy. In the literature reviewed, more than 40 species of *Clinostomum* were recorded. According to Ukoli (1966), however, 19 among 44 species recorded belonging to genus *Clinostomum* recorded in Asia, Africa and America were identified as synonyms of *C. complanatum*. Moreover, Fejzullaev and Mirzoeva (1983) transferred *C.*

**Table 1.** Comparison of the measurements of *C. complanatum* adult worms from humans and herons

		Present specimen (1994)	Yamashita (1938)	Yamaguti (1933)	Kagei <i>et al.</i> (1988)
No. exam.		1	1	n.d. <sup>a)</sup>	10
Body	L <sup>b)</sup>	4.74 mm	3.7	4.6	3.21-5.58
	W <sup>c)</sup>	1.05	1.9	1.68	1.94-2.36
Oral sucker	L	0.29	0.44	0.28	0.24-0.40
	W	0.43	—	0.33	0.34-0.46
Pharynx	L	—	—	0.08	0.12-0.16
	W	—	—	—	0.11-0.21
Acetabulum	L	0.72	0.95	0.7	0.45-0.83
	W	0.64	—	—	0.61-0.80
Testes Anterior	L	0.53	—	0.4	0.31-0.76
	W	0.51	—	0.71	0.61-1.04
Posterior	L	0.35	—	0.25	0.20-0.44
	W	0.55	—	0.79	0.26-1.21
Ovary	L	0.15	0.27	0.25	0.19-0.38
	W	0.12	—	0.16	0.21-0.87
Cirrus pouch	L	0.29	—	—	0.28
	W	0.16	—	—	0.18
Eggs	L	101-123 $\mu$ m	108-127	114-120	110-124
	W	63-83	70-80	72-78	62-72
	Op <sup>d)</sup>	22-27	—	—	20-26
Source		human	human	heron	heron

<sup>a)</sup>n.d., not described; <sup>b)</sup>L, length; <sup>c)</sup>W, width; <sup>d)</sup>Op, operculum.

*detruncatum* and *C. heluans* to the genus *Clinostomoides*, and *C. intermediale* to a new genus *Neutraclinostomum*. *C. phalacrocoracis* regarded as a synonym of *N. intermediale*, *C. philippinense* as that of *Tumaclinostomum multicaecum*, and *C. africanum* as *Euclinostomum heterostomum*. The remaining 38 species were regarded as synonyms of *C. complanatum*. Therefore, *C. complanatum* is regarded as the only species of the genus *Clinostomum*.

Since the first human infection with *C. complanatum* had been reported (Yamashita, 1938), all the additional case records have been reported in Japan except for two cases reported in Israel (Witenberg, 1944) and India (Cameron, 1945). There have been 16 case reports of human infection in Japan (Yamashita, 1938; Hōri, 1942; Kamo *et al.*, 1962; Sakaguchi *et al.*, 1966; Sano *et al.*, 1980; Kumada *et al.*, 1983; Hirai *et al.*, 1987; Furukawa and Miyazato, 1987; Hayashida and Takao, 1988; Yamane *et al.*, 1990; Umezaki *et al.*, 1990; Yoshimura *et al.*, 1991; Isobe *et al.*,

1992; Kifune and Kousaka, 1994; Kifune *et al.*, 1994; Isobe *et al.*, 1994). Among the cases in Japan, 11 cases were thought to be caused by eating the raw flesh of carp or crucian carp. In Korea, carp and crucian carp are the fresh-water fish which are the most commonly consumed in raw. The authors found a few enzootic foci of *C. complanatum* in the central regions of Kyongsangbuk-do (Chung *et al.*, unpublished) and clarified that *Radix auricularia coreana* plays a role of the first intermediate host and several species of fish, the second intermediate hosts.

No conspicuous spine was found on the tegument of the present specimen. However, further studies using a scanning electron microscope may be needed to elucidate the fine ultrastructures of tegument of this fluke.

Because eating raw fresh-water fish is a tenacious habit of the residents and there are, at least a few, enzootic foci in Kyongsangbuk-do, Korea, it is necessary to pay more attention to eating fresh-water fish, with regard to human infection by *C. complanatum*.

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=초록=

### 새인두흡충(*Clinostomum complanatum*)에 의한 인두염 제1례

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새인두흡충에 의한 인체감염 제1례를 보고한다. 환자는 56세 된 남자로서 3-4일간의 인후부 이물감과 염증성 증상으로 이비인후과의원을 방문하여 오른쪽 인두 후벽에 흡착한 충체를 제거하였다. 충체는 *Clinostomum complanatum*으로 동정되었다. 환자는 평소 담수어의 생식을 즐겼으며 의원 방문 4일전에도 낚시로 포획한 담수어를 생식한 적이 있었다. 우리 나라에서도 이 흡충에 의한 인두염의 예방을 위해 담수어의 생식에 더 깊은 주의가 요망된다고 생각된다. *Clinostomum complanatum*의 우리 말 이름을 새인두흡충으로 제안한다.

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