A Woman Who Excreted a Tape-Like Substance
(See pages 516–7 for the Photo Quiz)

Figure 1. Unfragmented *Diphyllobothrium latum* or *Diphyllobothrium nihonkaiense* excreted after injection of amidotrizoic acid (Gastrografin; Nihon Shering). A dram-stick–shaped scolex was identified (arrow), and a characteristic uterus was observed at the center of each proglottid (inset).

Diagnosis: Diphyllobothriasis (fish tapeworm infection due to *Diphyllobothrium latum* or *Diphyllobothrium nihonkaiense*).

The excreted organism was composed of a tape-like chain of connected segments (proglottids) with a central uterus (figure 1), which are characteristic of *Diphyllobothrium* species (fish tapeworms). Proglottids of *Diphyllobothrium* organisms are usually wider than they are long. On the other hand, mature proglottids of *Taenia saginata* and *Taenia solium* are longer than they are wide. *D. latum* is the most common *Diphyllobothrium* species in northern Europe (the region including Finland, East Prussia, and Russian Karelia) and in North America [1]. *D. nihonkaiense*, which is common only in Japan, was previously erroneously identified as *D. latum* but thereafter was identified as an independent species [2], although morphological discrimination between these species requires expert assistance. Other *Diphyllobothrium* species are smaller and rarely >1 m long [1]. Therefore, the infecting species in our patient was probably *D. latum* or *D. nihonkaiense*.
Humans become infected by ingesting *Diphyllobothrium* ple-
roceroid larvae in fish (or fish roe) or liver that is raw or
incompletely cooked. A variety of freshwater fish, as well as
some marine fish, are sources of infection. Among them,
salmon and trout are the most common sources [1, 3]. Interview
of our patient revealed that she ingested trout sushi 1
month before presentation to the hospital. In Japan and the
Scandinavian countries, the strong cultural preferences for eat-
ing dishes containing raw fish have been associated with high
rates of transmission. In general, the incidence of fish tapeworm
infection among humans seems to be decreasing, but in the
United States, the increasing popularity of raw fish dishes, such
as sushi and sashimi, is placing more consumers at risk for
infection.

To treat cestodiasis, many types of antiparasitic agents, in-
cluding niclosamide and praziquantel, are administered orally,
and most of them have the antiparasitic effect of destroying
the worm body. However, destroying the worm body makes it
difficult to identify an ejected cestode head (or scolex), which
is important for confirmation of cure, because the residual
scolex in a patient’s intestine causes recurrence of cestodiasis.
Furthermore, in the case of *T. solium*, the broken proglottids
release ova, which may cause dangerous cysticercosis [4]. Since
Oi et al. [5] reported the successful expulsion of unfragmented
cestodes by intraduodenal injection of amidotrizoic acid (Gas-
 trografin; Nihon Shering), many patients in Japan with ces-
 todiasis have been treated with this agent [6]. Gastrografin
injection is now the treatment of choice for cestodiasis in Japan,
although the mechanism of the expulsive effect of this agent
is not clear.

In this case, radiography after intraduodenal Gastrografin
injection revealed the presence of a tapeworm as a longitudinal
filling defect in the ileum (figure 2), and thereafter, an unfragmented tapeworm with a dram-stick shaped scolex (figure 1) was successfully excreted. The patient did not need further treatment.

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References