A 56-year-old woman was transferred from an outside hospital owing to concern about pancreatic duct (PD) obstruction and a pancreatic head mass. The patient had been admitted 1 week prior to the transfer with abdominal pain radiating to the waist and back, accompanied by nausea and vomiting. Her symptoms had since resolved with supportive measures, including anti-inflammatories and analgesics. Physical examination on admission did not reveal a jaundiced complexion and her abdomen was soft without tenderness. Outpatient laboratory results demonstrated a mildly elevated cancer antigen 199 (CA199) at 41.02 U/mL, but liver function panel, and serum and urinary amylase were within the normal ranges. Abdominal computed tomography (CT) at the previous hospital had shown PD dilatation and pancreatic head enlargement (Fig. 1).

After admission, the patient underwent endoscopic ultrasonography (EUS). EUS from the stomach showed the PD dilatation in the body and tail of the pancreas, a solid round hyperechoic area without acoustic shadowing in the PD within the pancreatic neck, the linear hyperechoic area without central hypoechoic rim (“innertube” sign) in the PD within the pancreatic head, and a linear hyperechoic area without central hypoechoic rim (“innertube” sign) in the PD within the pancreatic head (Fig. 2a). The scan of the neck of the pancreas revealed a solid round hyperechoic lesion without acoustic shadowing in the PD (Fig. 2b), so PD stones were ruled out. A linear hyperechoic area was seen in the PD within the pancreatic head during scanning from the duodenal bulb, but there was no central hypoechoic rim (“innertube” sign) (Fig. 2c). Side-viewing endoscopy showed the shape and size of the duodenal papilla were normal and no worms were noticed within the intestines. EUS from ampulla demonstrated the PD and bile duct openings were normal. A repeat pancreatic head scan from the descending duodenum...
was performed, and a solid round hypo-
echoic area without acoustic shadowing
was again seen in the PD (Fig. 2d).
A diagnosis of an Ascaris in the PD was
considered. Accordingly, an endoscopic
retrograde cholangiopancreatography
(ERCP) was performed. After successful
intubation, pancreatography showed
that the PD was dilated. A stripe-like fill-
ing defect was seen in the PD (Fig. 3).
An endoscopic sphincterotomy was then
performed and the papillary sphincter
was dilated to 4 mm with balloon dilation
catheters. Another stone extraction bal-
loon was used for foreign body removal.
A moving, white round worm was dis-
charged from the papilla in a folded
shape (Fig. 4; Video1). The Ascaris
was extracted with foreign body forceps
and taken out from the mouth (Fig. 5).
Subsequently, a PD stent was placed to
complete the procedure. The patient
recovered well and was treated with
anthelmintic agents.
Unlike in the more common cases of pan-
creatic ascariasis that are associated with
either a large worm burden in the duo-
denum, part of the worm being visible
through the duodenal papilla [1], or
accompanying biliary ascariasis [2],
which is easy to diagnose, in this case
there was only a single worm that had
completely entered the PD, meaning it
could be easily misdiagnosed as pancre-
atric head cancer. The risk of misdiagnosis
is due to the following aspects: (i) an
Ascaris has no characteristic manifesta-
tion on CT or magnetic resonance imag-
ing, but appears as a long curved and
transparent shadow, meaning intraduc-
tal ascariasis could be easily mistaken for
a dilated PD; (ii) pancreatitis caused by
Ascaris is commonly mild [3] and the clin-
ical symptoms could completely disap-
pear before the patient sees a doctor,
meaning the subsequent pancreatic
head enlargement caused by pancreatitis
could be easily misdiagnosed as a pan-
creatic head mass; (iii) the level of cancer
antigens, such as CA199, frequently in-
crease in cases of pancreatic ascariasis;
however, such increases are mild and
reversible.
It is therefore important to keep PD ascari-
asis in the differential diagnosis when
one encounters an unexplained pan-
creatic head mass and PD dilatation, espe-
cially in patients with upper abdominal pain at the time of onset. EUS and ERCP are effective methods for the diagnosis and management of this condition.

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**Competing interests**

The authors declare that they have no conflict of interest.

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**References**


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**Fig. 5** Photograph showing the Ascaris (about 20 cm in length) after its removal.