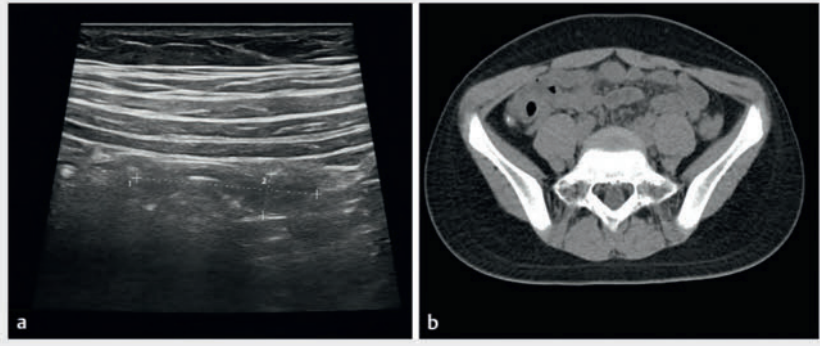


Acute obstructive appendicitis in a child caused by pinworms treated with endoscopic direct appendicitis therapy

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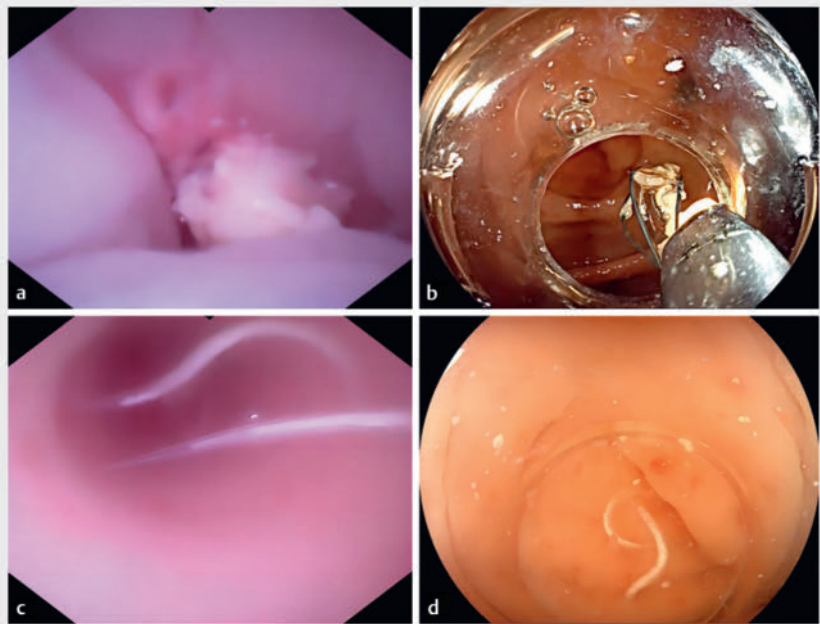


▶ Video 1 Acute obstructive appendicitis in a child caused by pinworms treated with endoscopic direct appendicitis therapy.



▶ Fig. 1 a Ultrasound indicated abnormal curved tubular echo with thick and rough walls, suggesting acute appendicitis. b Computed tomography (CT) revealed enlarged appendix, fecal stones of high density, and enlarged surrounding lymph nodes.

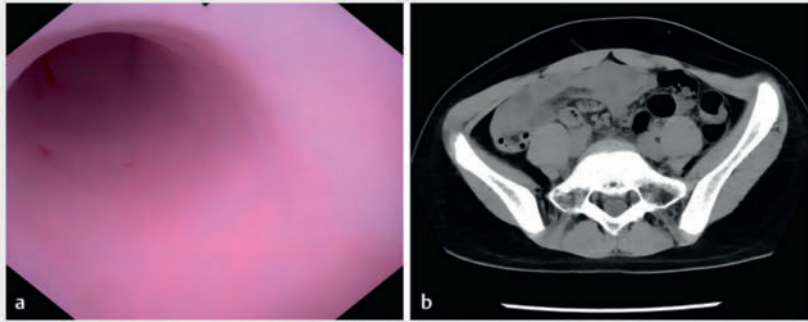
A 10-year-old girl presented with a 1-day history of lower right abdominal pain, anorexia, nausea, and vomiting. Ultrasound revealed a tortuous appendix lumen with thick and rough walls (▶ **Fig. 1 a**). Computed tomography (CT) scan showed an enlarged appendix with high-density fecaliths and enlarged lymph nodes (▶ **Fig. 1 b**), leading to a diagnosis of acute obstructive appendicitis. After obtaining informed consent, we performed endoscopic direct appendicitis therapy (EDAT) using a 9-Fr cholangioscope (EyeMax; Micro-Tech, Nanjing, China) (▶ **Video 1**), which revealed numerous fecaliths caused by parasites in the appendiceal cavity (▶ **Fig. 2 a**). These slightly white fecaliths, containing white-striped parasites, were extracted using a disposable basket (▶ **Fig. 2 b**) and flushed with metronidazole and saline solution (▶ **Fig. 2 c**). Numerous parasites were evacuated by negative pressure (▶ **Fig. 2 d**), leaving the mucosa mildly congested (▶ **Fig. 3 a**). The patient's abdominal discomfort rapidly improved. Follow-up CT showed the disappearance of the fecaliths and reduced inflammation (▶ **Fig. 3 b**). Laboratory results confirmed the presence of *Enterobius vermicularis*, or pinworms (▶ **Fig. 4 a–d**).



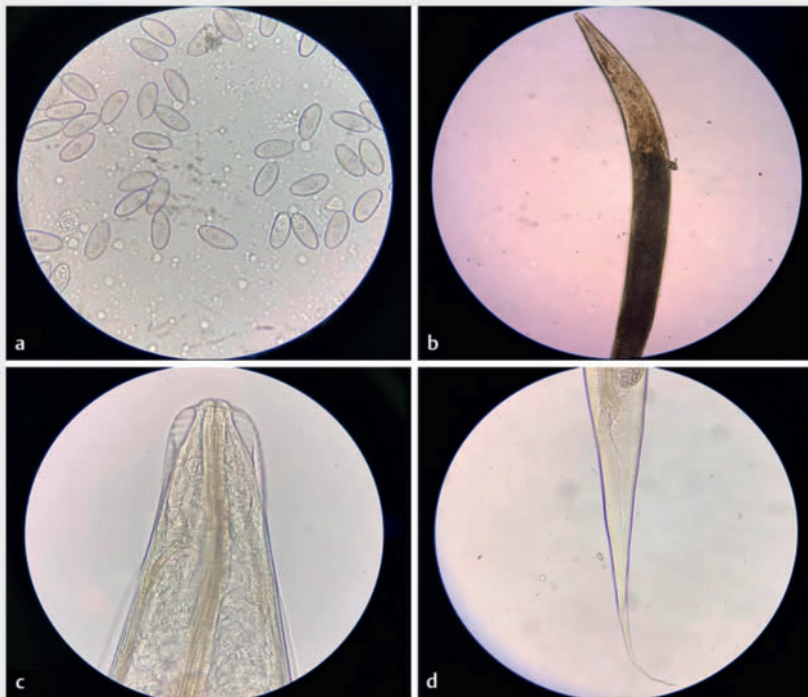
▶ Fig. 2 Endoscopic direct appendicitis therapy. a Fecaliths caused by parasites in the appendix cavity were slightly white through the cholangioscope. b Several fecaliths containing white striped parasites were meticulously extracted under the visual guidance of the cholangioscope. c Free live pinworms in the appendix cavity were flushed following repeated lavages with metronidazole and sodium chloride. d A large number of free parasites were flushed out into the intestinal cavity; they appear white and slender.

Enterobius vermicularis accounts for 7% of acute appendicitis cases and is associated with a higher rate of unnecessary

appendectomies [1]. Traditionally, the diagnosis depended on surgical and pathological findings [2,3]. This case



► **Fig. 3** **a** Through the cholangioscope, the appendiceal cavity was observed to be clear and the mucosa mildly congested. **b** Postoperative CT demonstrated disappearance of fecal stones compared to preoperative CT.



► **Fig. 4** The microscopic observation of *E-vermicularis*' eggs in the liquid drawn out by negative pressure in the appendix cavity. **a** *E-vermicularis* eggs were colorless and transparent with a thick eggshell and no egg cover, resembling grains of rice. **b** The body of *E-vermicularis*: enlargement. **c** The head of *E-vermicularis*: the cuticle has horizontal stripes and expands to form the head wing. **d** The tail of *E-vermicularis*: straight and pointed.

demonstrates the live morphology of pinworms in the appendix through a cholangioscope, illustrating how pinworms cause appendicitis by promoting the formation of fecaliths and subsequent obstruction. The patient was discharged on the first day after EDAT, highlighting its potential for minimally

invasive treatment. This approach offers significant diagnostic advantages over other modalities and emphasizes the importance of technological integration in endoscopic practices.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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