

## How I Do It

# Endometriosis-induced appendiceal intussusception

Hung-Hua Liang, M.D.<sup>a</sup>, Ming-Te Huang, M.D.<sup>a</sup>, Po-Li Wei, M.D.<sup>a</sup>, Wang Weu, M.D.<sup>a</sup>,  
Yun-Ho Lin, M.D.<sup>b</sup>, Cheng Tiang, M.D.<sup>c</sup>, Chun-Chao Chang, M.D.<sup>c,\*</sup>

<sup>a</sup>Department of Surgery, <sup>b</sup>Department of Pathology, and <sup>c</sup>Division of Gastroenterology, Department of Internal Medicine, Taipei Medical University Hospital, Taipei, Taiwan

### KEYWORDS:

Appendiceal  
intussusception;  
Endometriosis

**Abstract.** Appendiceal intussusception is a rare entity that is difficult to diagnosis before surgery both clinically and radiologically. We report here a case of a 55-year-old woman with a 6-month history of right lower abdominal pain caused by appendiceal intussusception. Laparoscopic appendectomy was performed. Endometriosis foci were identified in the appendix tip and became the leading point of the appendiceal intussusception. The appendix was removed laparoscopically, which is the optimal treatment for such patients.

© 2009 Elsevier Inc. All rights reserved.

## Case report

A 55-year-old woman consulted a local clinic for an annual examination. While giving her medical history during the examination, she complained of intermittent right lower abdominal pain for the previous 6 months. She had no other symptoms, and her vital signs were normal. Colonoscopy was scheduled 1 week later; it showed a mushroom-like lesion with a central depression in the appendiceal orifice. The lesion's appearance changed on air insufflation (Fig. 1). A biopsy specimen of the edge of this lesion confirmed appendiceal tissue. Abdominal computed axial tomography (CAT) showed an enlarged appendix with an inverted tip (Fig. 2). Results of laboratory tests were normal. Laparoscopic appendectomy was performed. Appendiceal intussusception was noted by laparoscopic exploration (Fig. 3). Histologic section revealed atrophic endometrial implants, which were positive for both estrogen- and progesterone-receptor staining (Fig. 4). Marked smooth muscle hyperplasia formed a mass and became the leading point of appendiceal intussusception.

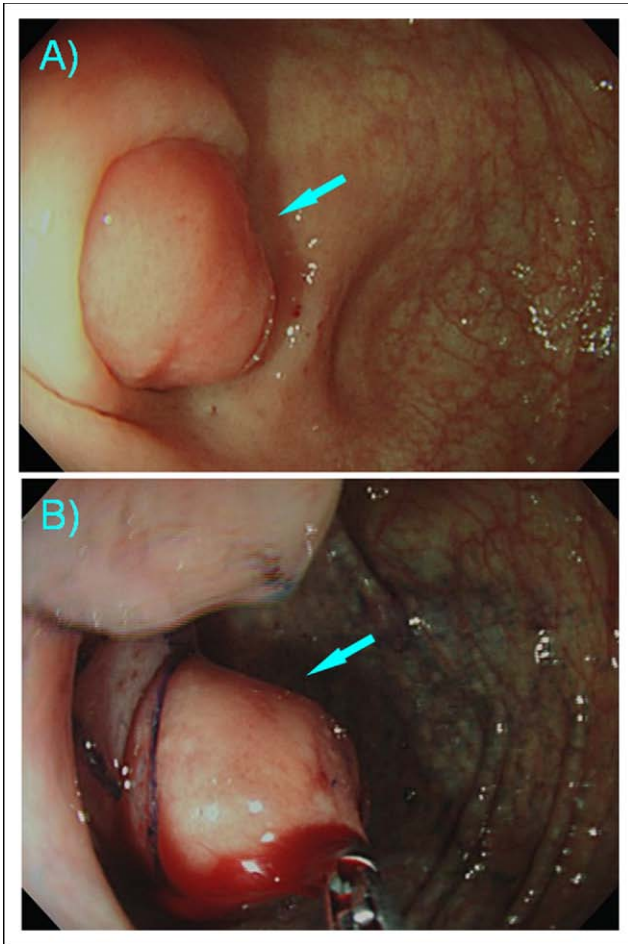
\* Corresponding author. Tel.: +011-886-2-27372181-3918; fax: +011-886-2-2738-9524.

E-mail address: b8501133@tmu.edu.tw

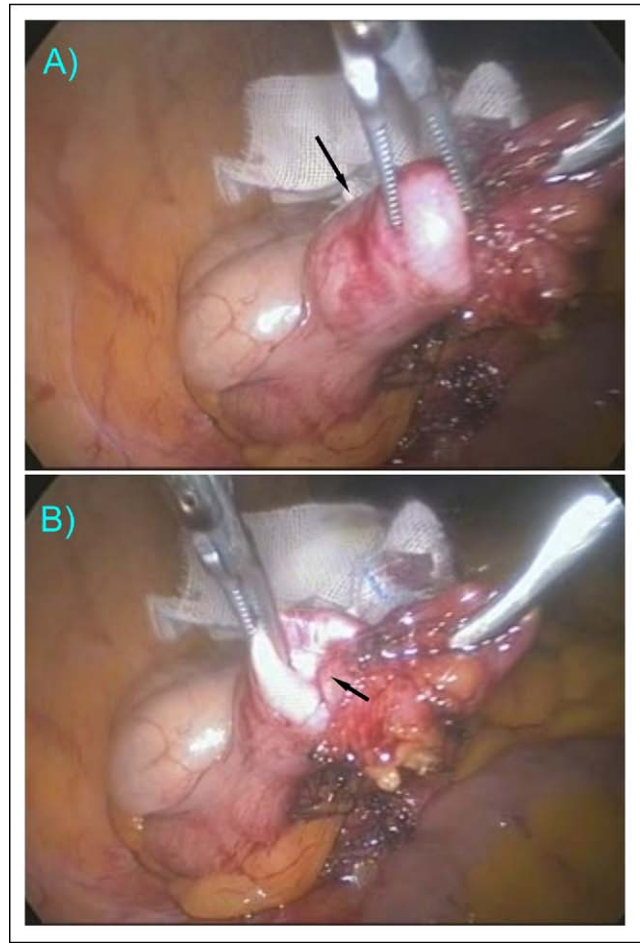
Manuscript received December 4, 2007; revised manuscript April 15, 2008

## Comments

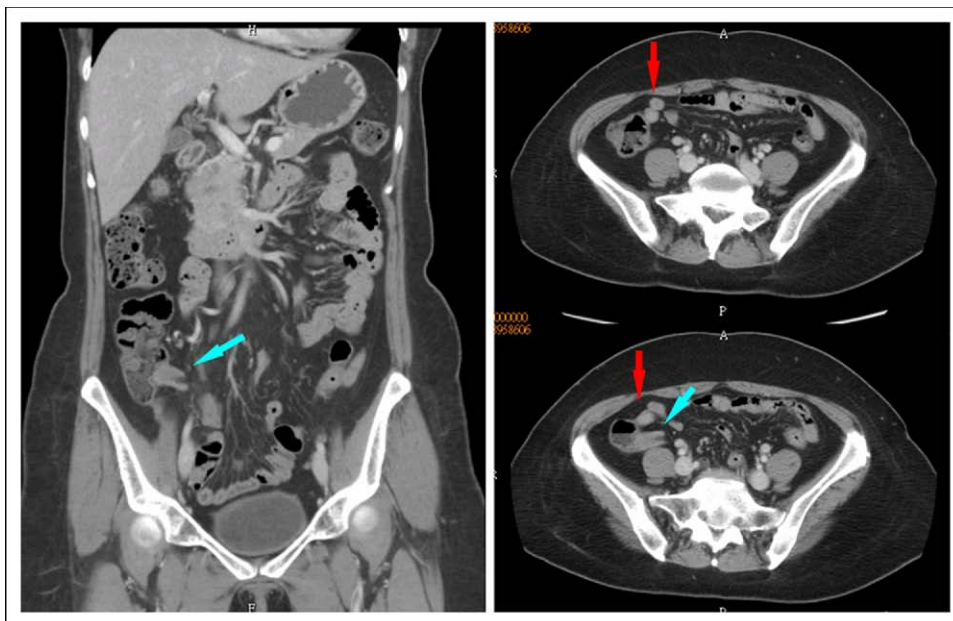
Appendiceal intussusception is a rare entity that is difficult to diagnosis before surgery both clinically and radiologically. It was first reported in 1858 by McKidd in a 7-year-old boy.<sup>1</sup> In 1963, Collins concluded a 40-year study on 71,000 removed appendices from which he reported an incidence of .01% for intussusception of the vermiform appendix.<sup>1</sup> The cause of appendiceal intussusception may be caused partly by such anatomic factors as a mobile mesoappendix or a wide proximal appendicular lumen. Intrinsic abnormalities of the appendix noted in this condition include polyps, mucoceles, parasites, endometriosis, lymphoid hyperplasia, and adenocarcinoma.<sup>2</sup> The clinical presentation of appendiceal intussusception includes a wide spectrum of symptoms, although some cases of entirely asymptomatic patients have been reported. Appendiceal intussusception may manifest by symptoms of acute appendicitis, intussusception, or recurrent, crampy right lower quadrant abdominal pain.<sup>3</sup> It is thought that patients who are diagnosed with appendiceal intussusception are at high risk for intestinal intussusception. In half of the cases reported, appendiceal intussusception acted as a lead point for compound ileocolic intussusception.<sup>4</sup> Therefore, appendectomy is recommended because the inverted appendix may act as a lead point for the secondary intussusception.



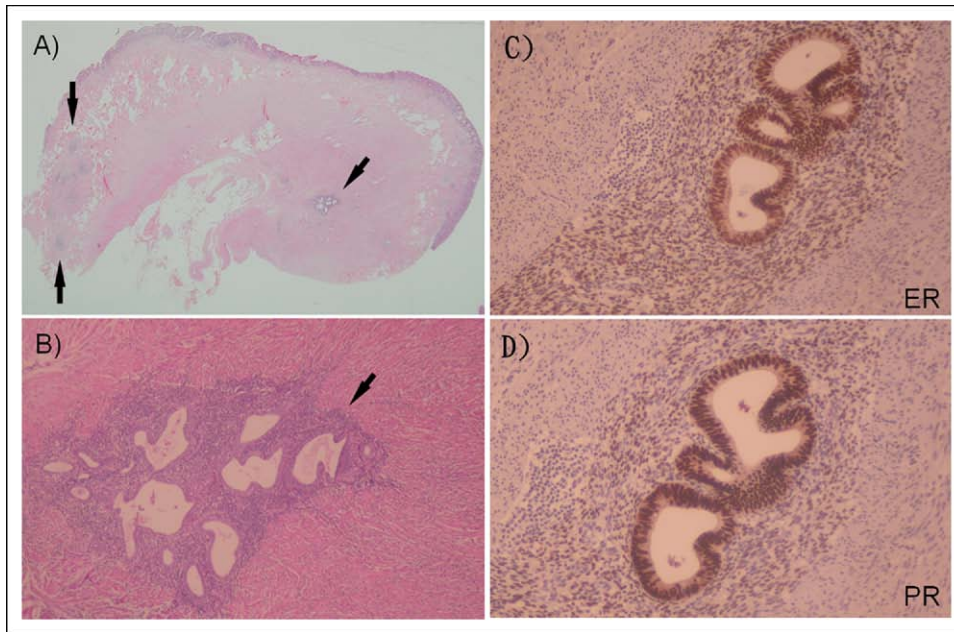
**Figure 1** (A and B) Tumor is in the appendiceal orifice (arrow). The lesion's appearance changed on air insufflation.



**Figure 3** (A and B) Appendiceal intussusception is noted on laparoscopic exploration.



**Figure 2** Abdominal computed tomography showed terminal ileum (red arrows) and an enlarged appendix with an inverted tip (blue arrows).



**Figure 4** (A) Several foci of a glandular lesion embedded in the thickened muscular wall (hematoxylin and eosin; original magnification  $\times 40$ ). (B) Atrophic gland and stroma cells are noted (hematoxylin and eosin; original magnification  $\times 100$ ). (C and D) Atrophic endometrial glands and stroma cells, which are positive in estrogen- (ER) and progesterone-receptor (ER) staining, respectively (original magnification  $\times 400$ ).

Endometriosis is a common disorder and affects approximately 15% of menstruating women in the United States. The bowel is involved in 5% to 37% of these patients.<sup>5</sup> Endometriosis of the appendix is also a uncommon lesion. Uohara et al reported an .8% incidence of appendiceal endometriosis in approximately 1500 appendectomies; however, he did not report any relation to intussusception.<sup>6</sup> Because the clinical and laboratory findings might not be pathognomonic, the diagnosis will be based on histologic examination showing 2 of the following 3 characteristic signs: intrauterine glands, stroma cells, or hemorrhage.<sup>7</sup> In our case, laparoscopic appendectomy for the patient with an appendiceal mass was feasible and safe, thus obviating the need for a second hospital admission, and avoided misdiagnoses.<sup>8</sup>

## References

- Ozuner G, Davidson P, Church J. Intussusception of the vermiform appendix: preoperative colonoscopic diagnosis of two cases and review of the literature. *Int J Colorectal Dis* 2000;15:185–7.
- Takahashi M, Sawada T, Fukuda T, et al. Complete appendiceal intussusception induced by primary appendiceal adenocarcinoma in tubular adenoma: a case report. *Jpn J Clin Oncol* 2003;33:413–5.
- Koumanidou C, Vakaki M, Theofanopoulou M, et al. Appendiceal and appendiceal-ileocolic intussusception: sonographic and radiographic evaluation. *Pediatr Radiol* 2001;31:180–3.
- Pumberger W, Hormann M, Pumberger G, et al. Sonographic diagnosis of intussusception of the appendix vermiformis. *J Clin Ultrasound* 2000;28:492–6.
- Chiou YY, Pitman MB, Hahn PF, et al. Rare benign and malignant appendiceal lesions: spectrum of computed tomography findings with pathologic correlation. *J Comput Assist Tomogr* 2003;27:297–306.
- Kimura H, Konishi K, Yabushita K, et al. Intussusception of a mucocele of the appendix secondary to an obstruction by endometriosis: report of a case. *Surg Today* 1999;29:629–32.
- Khoo JJ, Ismail MS, Tiu CC. Endometriosis of the appendix presenting as acute appendicitis. *Singapore Med J* 2004;45:435–6.
- Senapathi PS, Bhattacharya D, Ammori BJ. Early laparoscopic appendectomy for appendicular mass. *Surg Endosc* 2002;16:1783–5.