



## Peritoneal inclusion cysts in patients affected by Crohn's disease: magnetic resonance enterography findings in a case series



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### ABSTRACT

Peritoneal inclusion cysts arise when fluid produced by ovary is trapped within peritoneal adhesions. In this article, we describe a case series of patients affected by Crohn's disease, undergoing to magnetic resonance enterography, in whom it was possible not only to monitor the pathological findings of small bowel but also to primarily diagnose the presence of peritoneal inclusion cysts. The current knowledge of peritoneal inclusion cyst concomitant to Crohn's disease is still limited, often leading radiologists to misdiagnose it.

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### 1. Introduction

Peritoneal inclusion cysts (PICs), also known as *peritoneal pseudocyst*, *multilocular peritoneal inclusion cyst*, and *inflammatory peritoneal cyst*, are reactive, fluid-filled lesions of the peritoneal serosa.

To date, scientific literature has produced contradictory reports about its origin, sex, and age predilection, and while this was previously considered as an unusual finding, it has been recently reported how this entity is commonly misdiagnosed prior to surgical approach either by radiologists and gynecologists.

Nevertheless, cases reported up to now are quite heterogeneous; specifically, only one case reported the finding of PIC in a patient affected by Crohn's disease (CD), and only a few of them were supported by large case series, where only some mentions have been done about the possible correlation with inflammatory bowel diseases [1,2].

Nowadays, the widespread use of magnetic resonance for the study of inflammatory bowel diseases, a technique also known with the term *magnetic resonance enterography* (MRE), has determined a wider identification of both intestinal and extraintestinal pathological findings [3].

In this article, we collected a case series of three premenopausal female patients affected by CD, in which MRE was decisive not only for identifying pathological intestinal findings but also for having allowed the detection and diagnosis of pelvic PICs prior to any surgical approach, confirming the constantly increasing potential of this imaging technique in supporting treatment decision. Finally, we describe the main imaging

characteristics of PICs at MRE and the different therapeutic approaches adopted for each patient.

#### 1.1. MRE technique

To perform a magnetic resonance of the small bowel, the patient is asked to fast from solids and liquids for 4–6 h prior to the study and to assume an amount of about 1500–2000 ml of a polyethylenglicole solution within 45 min before the beginning of the scan.

All MRI examinations of the small bowel were performed at our institution by using a 1.5T MRI system (GyrosanIntera, Philips, Best, The Netherlands) and phased-array abdominal coils, either in the supine or prone position.

We applied various T1- and T2-weighted pulse sequences along axial and coronal planes. High-resolution ultra-fast sequences such as true fast imaging with steady-state (True-Fisp; TR/TE: 4.20/2.10 ms, FA: 60°) and half-Fourier acquisition single-shot turbo spin echo (HASTE; TR/TE: ∞/80 ms) with and without fat-suppression are usually performed as well as fat-suppressed three-dimensional gradient-echo images (THRIVE; TR/TE: minimum/minimum, FA: 10–15°) either before and after intravenous gadolinium-based contrast material administration.

### 2. Description of the cases

#### 2.1. Case 1

A 49-year-old nulligravida female with longstanding history of CD, who had previously undergone to surgical resection of multiple bowel segments and ileorectal anastomosis, presented to our hospital 3 years ago for performing a follow-up MRE.

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Prior to examination, she was complaining a generic lower abdominal pain that she referred to be slowly increased during the past months.

MRI showed signs of active inflammation at the level of surgical anastomosis and the presence of a large cystic mass that was occupying the peritoneal recesses and enclosing the left ovary (Fig. 1a,b). No enhancement of the cystic lesion was demonstrated after intravenous administration of gadolinium (Fig. 1c). Subsequently, a transvaginal fluid aspiration was performed, showing a yellow and serous liquid content.

The patient, who entered menopause 1 year later, recently came back to our institution to perform a follow-up MRE that did not reveal any residual signs of cystic mass (Fig. 1d).

## 2.2. Case 2

A 35-year-old multiparous woman presented to her general practitioner with a monthly cyclical abdominal pain and with an incidentally noticed mass in her lower abdomen.

The patient's medical history was notable for longstanding CD, for which she had undergone small-bowel resection and right colectomy 5 years earlier.

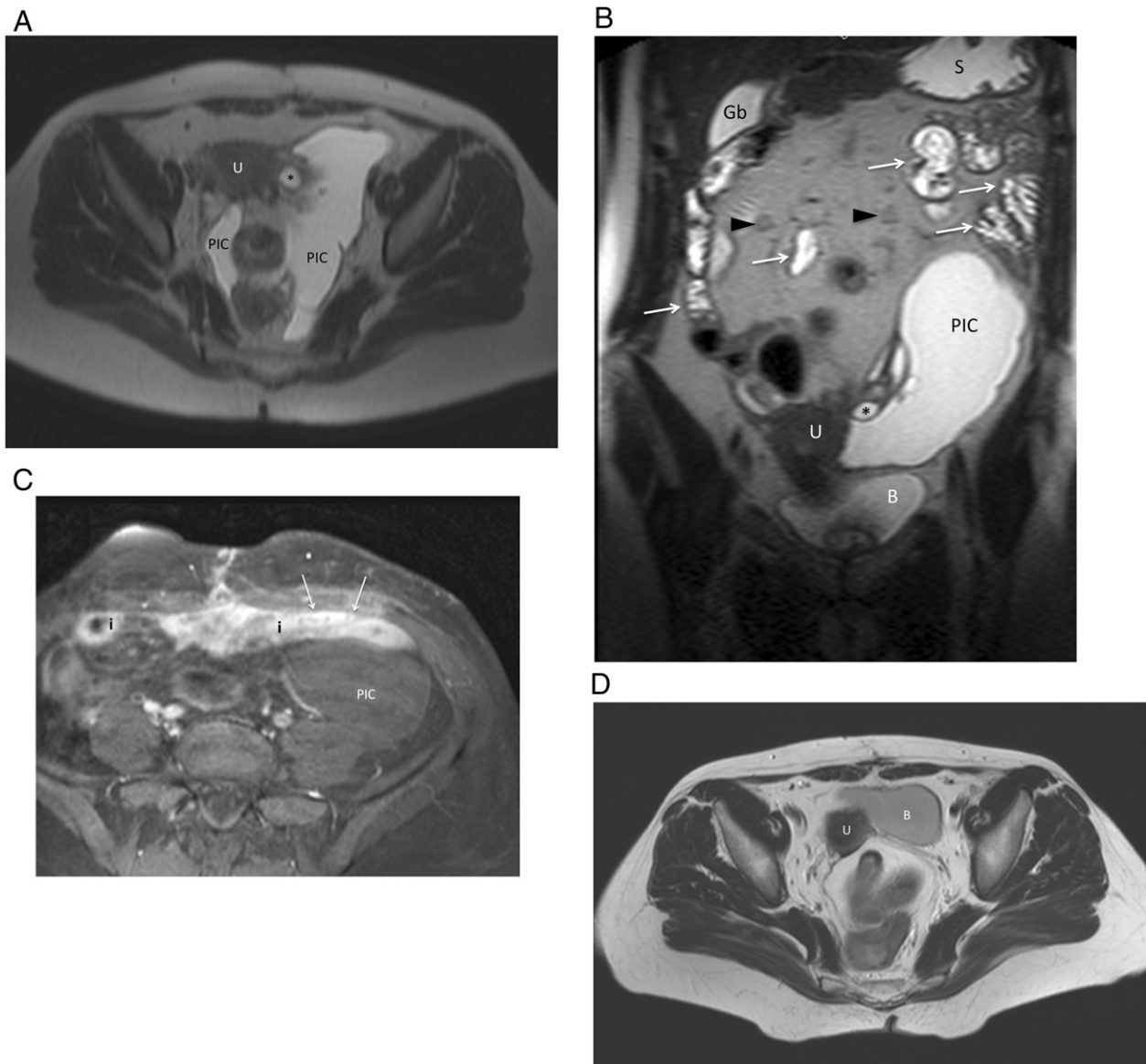
Laboratory evaluation did not reveal any element of novelty other than those already known and related to inflammatory bowel disease.

Ultrasound examination showed an irregularly shaped cystic mass lying on the anterior wall of abdominal cavity, with lack of nearby peristaltic movements and without a significant vascularity at color-Doppler.

A follow-up MRE, performed a few weeks later, confirmed the presence of a cystic mass with a markedly irregular morphology, and it better defined its location just upon the urinary bladder and below an inflamed small-bowel tract. Both ovaries were encompassed in the cystic mass walls.

The imaging pattern and the history of abdominal surgeries for CD deposited for the diagnosis of a large PIC (Fig. 2).

The patient, who had entered adalimumab treatment for CD a few weeks earlier, underwent cyst drainage and began a new therapy with oral contraceptives to reduce the risk of relapses.



**Fig. 1.** MRE images in a patient with longstanding CD and history of previous abdominal surgery. Axial (A) and coronal (B) HASTE images show a large PIC whose walls include the left ovary (asterisk). Arrows: residual small bowel loops. Arrowheads: reactive lymph nodes. Axial fat-suppressed T1-weighted gradient-echo sequence, performed after intravenous administration of gadolinium (C) demonstrates transmurial contrast enhancement of a pathological bowel segment (arrows), as a sign of active inflammation, adjacent to PIC. Follow-up axial HASTE image (D), performed 3 years later along the same level, shows no residual sign of PIC. S: stomach; Gb: gallbladder; i: ileum; U: uterus; B: bladder.

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