

## CASE REPORT

The Practice of Emergency Medicine

# Recurrent abdominal pain in an older woman: Enlarged OE-P gap on computed tomography as an indicator of non-strangulated obturator hernia

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**Abstract**

Obturator hernia (OH) is a relatively rare abdominal wall hernia with a high mortality rate. The diagnosis of OH is challenging because of symptomatic variations and spontaneous reduction in hernia on imaging. An 89-year-old woman presented to our emergency department with pain in the abdomen and right groin. Computed tomography (CT) revealed an incarcerated small bowel in the gap between the obturator externus and pectineus (OE-P gap). Symptoms disappeared after manual reduction. She experienced these same symptoms intermittently during the past year and underwent abdominal CT 4 times after disappearance of symptoms. The CT scans at each previous visit showed an enlarged OE-P gap (an average of 80 mm) compared with the asymptomatic side (an average of 34 mm). An enlarged OE-P gap on CT images taken after disappearance of symptoms could be a sign of spontaneously reduced OH.

**KEYWORDS**

abdominal pain, aged, herniorrhaphy, intestinal obstruction, obturator hernia, peritoneal cavity, x-ray computed tomography

## 1 | BACKGROUND

Obturator hernia (OH) is a relatively rare condition that constitutes approximately 0.2%–0.4% of all abdominal wall hernias and is most commonly seen in older emaciated women.<sup>1</sup> It has a high mortality rate of 10%,<sup>2</sup> and one of the causative factors for this is the difficulty in diagnosis because symptoms vary depending on the degree of herniation.<sup>3</sup> Because delayed diagnosis increases mortality,<sup>4</sup> it is important to suspect OH in its early stages from the available, though limited, information to avoid delaying appropriate examinations.<sup>5</sup> The diagnosis of OH is currently established using computed tomography (CT), which

demonstrates presence of incarcerated abdominal organs in the space between the obturator externus and pectineus (OE-P gap).<sup>4,6</sup> However, spontaneous reduction of the hernia into the peritoneal cavity before CT can complicate the diagnosis.<sup>7</sup> We report a case of recurrent OH that was undetected on multiple CT scans. Each time, symptoms disappeared spontaneously before the CT, and an incarcerated hernia was revealed only during the fifth episode.

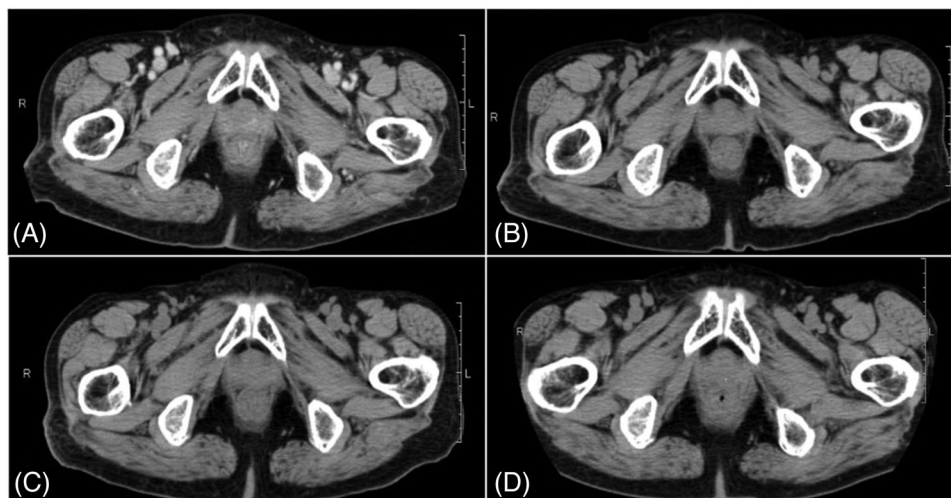
## 2 | CASE PRESENTATION

An 89-year-old woman presented to our emergency department (ED) with abdominal and right-sided groin to femoral pain. She had

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**FIGURE 1** Computed tomography (CT) scan taken (A) 11 months, (B) 10 months, (C) 11 days, and (D) 5 days before the time of admission. Each CT scan that was obtained after the patient's symptoms disappeared shows enlargements of the obturator externus and pectineus gap on the affected side were 7.6 mm (A), 7.6 mm (B), 8.1 mm (C), and 8.5 mm (D), respectively, averaging 8.0 mm, compared with the asymptomatic side averaging 3.4 mm.

occasionally experienced pain in these areas over the past year. At her initial ED visit 11 months earlier, the symptoms were suggestive of OH, and a contrast-enhanced CT scan was ordered. However, the symptoms disappeared immediately before undergoing CT, and small intestine dilation was the only abnormal finding on the scan (Figure 1A). On 3 separate occasions, at 10 months, 11 days, and 5 days before this presentation, she had experienced the same symptoms, only to have them disappear before obtaining an image (Figure 1B–D).

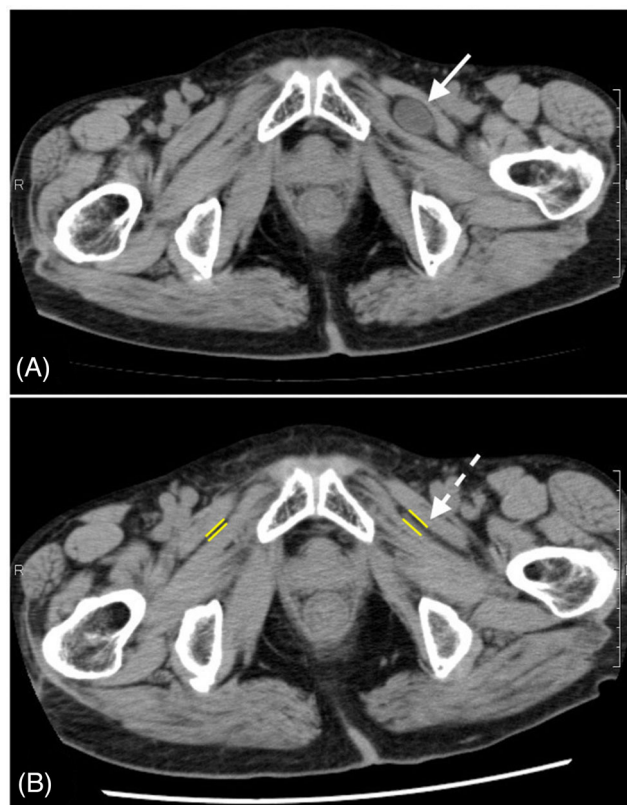
Her body mass index was 16.7 kg/m<sup>2</sup>. Her medical history included an appendectomy during childhood, a more recent laparotomy to treat bilateral urolithiasis, and an open right femoral hernia repair without surgical mesh performed 3 years ago. She had given birth to 3 children via normal vaginal delivery.

At the time of admission, her abdomen was soft and distended, with slight non-localized tenderness and right-sided groin to femoral pain without palpable mass. Abdominal CT showed small bowel incarceration in the OE-P gap (Figure 2A).

A general surgeon was called. The surgeon flexed her hip joint and performed ultrasound to visualize the hernia sac and manual reduction was performed. A follow-up CT showed the absence of hernia content, and an enlargement of the OE-P gap occupied its place (Figure 2B). Two months later, the patient underwent laparoscopic OH repair. She has not reported any further episodes of abdominal pain for 2 years.

### 3 | DISCUSSION

We encountered a case of recurrent OH that was reduced spontaneously and was undiagnosed on multiple occasions. Finally, at the fifth



**FIGURE 2** (A) Computed tomography (CT) scan of the abdomen showing an incarcerated small intestine in the obturator externus and pectineus (OE-P) gap (arrow). (B) CT scan showing absence of hernia contents after manual reduction. (Dotted arrow) The OE-P gap is 7.1 mm on affected side and 3.5 mm on asymptomatic side.

hospital visit, an incarcerated OH was visualized on CT. After a diagnosis of OH was made on the fifth CT scan, we reviewed the previous images. An enlargement of the OE-P gap compared to the unaffected side was observed in all previous CT scans (Figure 1A–D).

OH can be reduced spontaneously. In OHs, the hernia sac travels through the obturator canal and along the obturator nerve between the obturator externus and pectineus. OHs are anatomically classified into 3 stages: type I, in which the hernia content is only preperitoneal connective tissue and fat; type II, in which the peritoneum forms a hernia sac with internal fluid retention; and type III, in which the hernia sac contains intra-abdominal organs.<sup>8</sup> Diagnosis of OH is relatively easy if a CT scan is performed at the type III stage. OHs are likely to become incarcerated, resulting in strangulated small bowel obstruction.<sup>2,4</sup> Therefore, a CT scan should be performed without delay. However, clinicians should be mindful of the fact that a reduced hernia would not appear on the image. Otherwise, there is a risk of judging the patient's complaints as non-specific. In one report, 5 of 12 patients with OH had previous episodes before being diagnosed, suggesting that spontaneous reduction is common.<sup>9</sup>

An enlarged OE-P gap on CT may be a characteristic of non-incarcerated OH. In this case, previous physicians suspected an OH based on the medical history with the right-sided groin to femoral pain suggesting a Howship–Romberg sign, which is a characteristic symptom of OH. However, a definitive diagnosis could not be made because CT images did not show any herniation. However, the patient's previous CT scans showed an average of 8.0-mm OE-P gap on the affected side compared with an average of 3.4-mm gap on the asymptomatic side (Figure 1A–D). This may be indicative of a distended sac remaining after a recently incarcerated OH. Our findings are consistent with those of a previous case-control study comparing OE-P gap measured on previous CT between patients with diagnosed OH and older women without OH (average 9.0 and 3.8 mm).<sup>10</sup> To the best of our knowledge, to date, no studies have addressed the correlation between the existence of an enlarged OE-P gap and clinical course of OH. However, if OH progresses to the type III stage even once, the hernia sac is likely to be distended. In patients with a history suggestive of OH, an enlarged OE-P gap on CT could be informative to early diagnosis.

In conclusion, spontaneous reduction may complicate clinical examination, suggesting non-specific or psychogenic symptoms. Even if symptoms suggestive of OH have disappeared, OH cannot be ruled out because of this spontaneous recovery. In patients with improved

abdominal complaints, an enlarged OE-P gap on CT should be managed with a high level of clinical suspicion for OH and emergency physicians should consider consultations with surgeons if an asymmetry of the OE-P gap is found.

#### AUTHOR CONTRIBUTIONS

Yuita Fukuyama, Kazuki Toda, and Hiraku Funakoshi participated in the patient's care. Yuita Fukuyama drafted the manuscript, and all authors contributed substantially to its revision. Yuita Fukuyama takes responsibility for the paper as a whole.

#### REFERENCES

1. Yokoyama Y, Yamaguchi A, Isogai M, Hori A, Kaneoka Y. Thirty-six cases of obturator hernia: does computed tomography contribute to postoperative outcome? *World J Surg.* 1999;23(2):214-217.
2. Nasir BS, Zendejas B, Ali SM, Groenewald CB, Heller SF, Farley DR. Obturator hernia: the Mayo Clinic experience. *Hernia.* 2012;16(3):315-319.
3. Uludag M, Yetkin G, Kebudi A, Isgor A, Akgun I, Dönmez AG. A rare cause of intestinal obstruction: incarcerated femoral hernia, strangulated obturator hernia. *Hernia.* 2006;10(3):288-291.
4. Schizas D, Apostolou K, Hasemaki N, et al. Obturator hernias: a systematic review of the literature. *Hernia.* 2021;25(1):193-204.
5. Nazarian S, Narayanan A, Chang S. Diagnosis of an obturator hernia by CT. *BMJ Case Rep.* 2015;2015:bcr2015212239.
6. Park J. Obturator hernia: clinical analysis of 11 patients and review of the literature. *Medicine (Baltimore).* 2020;99(34):e21701.
7. Chang SS, Shan YS, Lin YJ, Tai YS, Lin PW. A review of obturator hernia and a proposed algorithm for its diagnosis and treatment. *World J Surg.* 2005;29(4):450-454.
8. Gray SW, Skandalakis JE, Soria RE. Strangulated obturator hernia. *Surgery.* 1974;75(1):20-27.
9. Nakayama T, Kobayashi S, Shiraishi K, et al. Diagnosis and treatment of obturator hernia. *Keio J Med.* 2002;51(3):129-132.
10. Kenmotsu M, Sato Y, Morishita N, Ishii H, Murakami T, Tsunemitsu K. Computed tomographic diagnosis of non strangulated obturator hernia (in Japanese). *Nihon Rinsho Geka Gakkai Zasshi (Journal of Japan Surgical Association).* 2001;62(2):353-357.

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