

## Case Report

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# A diagnostically challenging case of non-incarcerated obturator hernia: History and CT findings

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### Abstract

Obturator hernia is a rare disease that affects thin, elderly women. Non-incarcerated hernias are often particularly difficult to diagnose. We present a case of a non-incarcerated obturator hernia diagnosed based on patient history and Computed Tomography (CT) findings.

An 83-year-old female patient was referred to our department for a detailed examination of recurrent abdominal pain. Although she was asymptomatic at the time of presentation, she was suspected to have an obturator hernia based on recurrent right lower quadrant abdominal pain and a pain pattern that migrated from the epigastrium to the right groin for the past 3 years. Since the gap between the obturator externus and pectineus was >10 mm on CT and a hernia sac was present, she was diagnosed with a non-incarcerated hernia. The patient underwent obturator closure, and the recurrent abdominal pain disappeared after surgery. In attacks involving non-abdominal pain, it is important to make a diagnosis by combining the history at the time of the attack and CT findings.

**Keywords:** Obturator hernia; Non-incarcerated hernia; Recurrent lower abdominal pain; Pain pattern; Abdominal CT.

**Abbreviations:** BMI: Body Mass Index; CT: Computed Tomography

### Introduction

An obturator hernia is an internal hernia that fits within the obturator canal between the obturator externus and pectineus muscles. It is a disease that often develops in elderly and thin women. Obturator hernia is a rare condition, accounting for approximately 0.1% of all hernias and 1% of all small bowel obstructions [1-3]. Incarcerated hernias have a high intestinal resection rate and reported mortality rates of 12-70% [4,5]. Therefore, the prognosis is good if it can be diagnosed early at the time of non-incarceration. However, this is challenging because it is often difficult disease to diagnose.

Here, we report a case of non-incarcerated obturator hernia

based on a history of recurrent abdominal pain and Computed Tomography (CT) findings.

### Case presentation

An 83-year-old female patient was referred to us by a local physician for a detailed evaluation of right lower quadrant abdominal pain. The patient was asymptomatic at the time of presentation. Over the past 3 years, she had experienced right lower abdominal pain approximately once every few months. She reported an increased frequency of pain for the last 7 months; she had three attacks in the last 1 month. She visited a nearby general hospital 2 weeks prior and returned home without any abnormalities on CT or esophagogastroduodenoscopy.

She experienced pain again that night; therefore, she visited the emergency department of another general hospital but went home with no abnormalities on X-ray and orthopaedic evaluations. She again experienced right lower abdominal pain 2 days prior to the examination, visited a nearby doctor the next day, and was referred to our outpatient department. She had no symptoms, such as abdominal pain, at the time of examination.

In addition to recurring pain, the patient's history revealed a pain pattern that began in the first 10 minutes with epigastric pain, moving to the periumbilical region, right anterior thigh, coccygeal region, and finally the right groin. The pain lasted for several hours (3-7 hours) and gradually decreased in intensity during the second half of the attack. She was nauseous while she was in pain, but did not vomit. She had a medical history of hypertension (orally administered drugs for 5 years), reflux oesophagitis, colonic polyps, right cerebral aneurysm and left cerebral artery stenosis, but no history of abdominal surgery. She has no history of allergies or smoking or drinking habits. She has two children.

On physical examination, she was 141 cm tall and weighed 46.8 kg (Body Mass Index [BMI] 23.5 kg/m<sup>2</sup>). Blood pressure was 149/45 mmHg, pulse was 62 beats per minute with regular rate and rhythm, and temperature was 36°C. Chest examination revealed systolic and diastolic murmurs in the aortic valve area, and no abnormal breath sounds. Abdominal examination revealed no tenderness, no vascular murmur, and normal bowel sounds. No neurological abnormalities were observed. Her spine was kyphotic. Chest radiography showed a cardio-thoracic ratio of 56% and no abnormalities in the lung fields. Electrocardiography revealed an incomplete right bundle branch block. Blood test results were within normal limits. CT revealed no obvious inguinal hernia, and the obturator foramen was more dilated on the right than on the left; however, no obturator hernia was noted in the first report.

Her CT findings were reviewed because of recurrent right lower quadrant pain, increased frequency, and a pattern of pain suggestive of an obturator hernia. An incarcerated obturator hernia is easily diagnosed if CT shows an oval, low-density mass between the obturator externus and pectineus muscles. However, no hypodense masses were observed. Kenmotsu et al. reported that an obturator hernia can be suspected if the gap between the obturator externus and pectineus muscles was increased by >10 mm [5]. In this case, the gap between the right obturator externus and pectineus muscles was enlarged to 16.1 mm on CT cross-section (Figure 1). Moreover, the obturator foramen showed a cystic appearance in the coronal plane on CT (Figure 2); a non-incarcerated obturator hernia was therefore diagnosed.

After being diagnosed, she consulted a gastroenterological surgeon who decided to operate on the obturator hernia. Mild aortic regurgitation was diagnosed during the examination; therefore, after a detailed examination at the cardiology department, laparoscopic hernia closure was performed on an elective basis approximately 2 months later. The patient was informed that if she had experienced an attack of abdominal pain before the operation, she would have undergone emergency surgery; however fortunately there had been no such attack. Postoperatively, she had no particular complaints 1 year later.



**Figure 1:** Axial CT scan showing absence of hernia contents. The obturator externus and pectineus gap is 16.1 mm on right affected side and 8.4 mm on left asymptomatic side.



**Figure 2:** Coronal CT scan showing a right-sided hernia sac (denoted by the arrow).

### Discussion

Obturator hernia is a common disease in thin, elderly women and is called 'little old woman's hernia'. It occurs predominantly in thin, elderly female patients aged 70-90 years with BMI 17.9 ± 2.8 kg/m<sup>2</sup> [4,6]. Owing to the laxity of the pelvic support tissue due to ageing and childbirth, and because the pelvis is wider in women than in men and the inclination of the pelvis is almost perpendicular to the abdominal cavity, the obturator foramen tends to expand; 97% of obturator hernia patients are thus women [6,7]. Additionally, as the left side of the abdomen contains the sigmoid colon and covers the obturator foramen, there is a 2:1 predominance of right-sided hernias [4]. Bilateral hernias have also been reported, but are rare (6%) [4].

The patient was not lean and had a BMI of 23.5 kg/m<sup>2</sup>. Obturator hernias can develop due to increased abdominal pressure (chronic lung disease, constipation, kyphoscoliosis, etc.) [7,8]. Constipation was not confirmed in this case, but the patient's hunched back was believed to be one of the factors.

Obturator hernias are formed in three anatomical stages [2,4]. First, the pre-peritoneal part enters the pelvic foramen of the obturator foramen. In the second stage, a peritoneal dimple and sac are formed. In the third stage, the contents of the abdominal cavity, such as the small intestine, get involved, and symptoms of intestinal obstruction appear. In particular, in-

carceration of the ileum indicates Richter's hernia [9]. In many cases, spontaneous reduction results in repeated prodromal symptoms of small bowel obstruction, often leading to an incarcerated hernia [4].

In this case, right lower quadrant abdominal pain occurred once every several months for the past 3 years, and the frequency increased over the last 7 months ago. Natural reduction was repeated each time. A month prior, the frequency and duration of pain increased.

The typical pain associated with an obturator hernia is due to compression of the obturator nerve, and the pain radiates from the groin to the inside of the knee. It is called the Howship-Romberg sign and is characterised by radiating pain, paraesthesia, hyperaesthesia, and cramps, from the groin to the medial thigh and the medial side of the knee. It is triggered by compression of the obturator nerve during coughing and extension, adduction, and internal rotation of the thigh [4,10].

Although the Howship-Romberg sign was not tested in this case, the pain pattern revealed that it began with epigastric pain, moving to the periumbilical, right anterior femoral, and coccygeal areas, culminating in right inguinal and right groin pain. Inguinal pain indicated the compression of the obturator nerve. In an obturator hernia, pain migration is thought to be due to the movement of internal organs into the obturator sac.

Another diagnostic method is the Hannington-Kiff sign, which examines the femoral adductor reflex [10,11]. In it, the patellar tendon reflex is normal, and the adductor reflex disappears when the adductor tendon is struck 5 cm from the medial malleolus of the femur. This is because the obturator nerve is damaged by compression. This method is not well known and was not tested in this case.

CT, ultrasound, and magnetic resonance imaging are generally performed for diagnosing obturator hernias; however, CT is the gold standard [9,12,13]. Incarcerated hernias can be seen on CT; however, diagnosis is difficult in non-incarcerated hernias. Kenmotsu et al. reported that an obturator hernia should be suspected if the obturator externus and pectineus dilate by >10 mm on non-incarcerated CT [5]. In addition, Fukuyama et al. found interesting CT images at the time of incarceration and after manual reduction in which the hernia sac that was visible at the time of incarceration disappeared after reduction. The reported dilatation between the obturator externus and pectineus muscles after reduction was 7.1 mm [14].

In this case, an obturator hernia was suspected based on the history of frequent attacks of abdominal pain and the patient's pain patterns. However, it was difficult to diagnose because there were no symptoms during the CT examination when the hernia was not incarcerated. Initially, a radiologist did not report obturator hernia, but it was suspected due to >10 mm dilatation of the obturator externus and pectineus muscles, and a coronal hernia sac was observed. After review by the radiologist, a diagnosis of obturator hernia was made. Hernia closure was performed after consultation with the surgeon. One year later, no further abdominal pain was observed.

Although diagnosis was difficult, we re-affirmed the importance of medical history. In addition, since obturator hernia is a rare disease, and there are few opportunities to encounter it as a clinician, we realised that it was important to carefully re-examine past cases and review troublesome ones.

## Conclusion

Obturator hernias are rare and difficult to diagnose, particularly when the hernias are not incarcerated. We encountered a case of non-incarcerated obturator hernia in a non-lean elderly woman. A history of recurrent abdominal pain, pain patterns, and CT findings were particularly useful in the diagnosis of this case.

## Declarations

**Author's contributions:** SY reviewed the literature and drafted the manuscript. KK and SF critically reviewed the manuscript.

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