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### Strangulated Umbilical Hernia: A Case Report

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#### ABSTRACT

**Background:** The abdominal wall hernia repair was one of the most frequently performed operations by general surgeons worldwide. The second most common hernia operation is repairs of umbilical hernia. It is estimated that 5% of individuals will develop an abdominal wall hernia over their lifetime. This study aimed to present a case of strangulated umbilical hernia.

**Case presentation:** 51 years old male patient presented with sharp, non-radiating pain in the left abdominal region, obstipation, and noted bulge at his umbilicus about one year ago that did not shrink when he was lying down two days ago, the diameter about 7 cm. A plain Abdominal X-ray showed partial small bowel obstruction. The patient was taken to the operation theatre for laparotomy resection and reanastomose ileum and repair hernia defect with mesh. Prior to surgery, the patient received antibiotic therapy with Cefazolin 2gr intravenous, and the nasogastric decompression tube (NGT) was installed. On exploration, it was found necrotic ileum along 15 cm and performed resection, followed by end-to-end anastomosis. After the surgical procedure, the patient's hemodynamics was stable. **Conclusion:** Overall mortality and prognosis of hernia are influenced by whether the surgery was emergent or elective. Mortality is increased to up to 3% with emergency surgery for strangulated bowel, notably when bowel resection is performed.

#### 1. Introduction

Hernias define as abnormal bulges or openings in the fascia of the abdominal wall. These defects can be found in any area of the abdominal wall fascia where there is an anatomic weakening present, commonly on the anterior abdominal wall (umbilical) and groin regions (inguinal, femoral). Hernias are classified as reducible, incarcerated, and strangulated based on several clinical features. If the contents within the hernia can be placed intra-abdominally through the layers of the abdominal wall, it is described as

reducible. Meanwhile, when the contents of the hernia are not able to be reduced, it defines as incarcerated hernia. If the hernia contents are ischemic due to a compromised blood supply, it is described as a strangulated hernia.<sup>1</sup> The strangulated hernia occurs most commonly when there is a small opening in the musculature and a significant quantity of contents within the hernia itself. Incarceration and strangulation of external hernias is a relatively common process in adults and is associated with a high rate of complications and mortality.<sup>2</sup>

The abdominal wall hernia repair was one of the most frequently performed operations by general surgeons worldwide. According to the National Center for Health Statistics, in the United States in the year 2003, repairs of umbilical hernia were the second most common hernia operation after inguinal hernia repair.<sup>3</sup> Although umbilical and periumbilical hernias are usually congenital and caused by the arrest of the normal spontaneous closure of the umbilical ring, resulting in a defect in the fascia covered by skin, they also can be found in the older patient.<sup>4,5</sup> In older patients, the onset is usually sudden, and the defect is relatively small. Predisposing factors for the development of umbilical hernias in adults are a condition that causes weak tissue strength, such in patients with collagen vascular disease and connective tissue disorders (Marfan syndrome, Ehlers Danlos); increased abdominal pressure such as in multiple pregnancies, obesity, hepatic cirrhosis with ascites, large abdominal tumors, straining due to constipation, chronic obstructive pulmonary disease (COPD), or chronic cough; people who engage in heavy lifting regularly also suggest at increased risk of hernia formation even still controversial.<sup>1,6</sup> It is estimated that 5% of individuals will develop an abdominal wall hernia over their lifetime. The risk of a hernia becoming incarcerated or strangulated is estimated between 1% to 3% over a person's lifetime.<sup>7,8</sup>

The patient may present with symptoms of bowel obstruction when incarcerated exist, including nausea, vomiting, and obstipation. If a strangulated hernia occurs and bowel ischemia is present, the patient will have severe pain and may present with sepsis (hypotension, tachycardia). It is important to inspect the skin overlying the hernia visually. Any appearance of erythematous or dusky skin concerns a possible strangulated hernia. If skin changes are noted, an emergent surgical consult should be

obtained before attempting to reduce the hernia. Overall mortality and prognosis are influenced by whether the surgery was emergent or elective. Mortality is increased to up to 3% with emergency surgery for strangulated bowel, notably when bowel resection is performed.<sup>9</sup>

## 2. Case Presentation

A 51 years old male was referred from Bali Royal Hospital with a diagnosis of obstructive ileus due to a suspected incarcerated umbilical hernia. He presented to the emergency department with a chief complaint of sharp, non-radiating pain in the left abdominal region that he felt two days prior to admission. He had noted a recurrent bulge at his umbilicus about one year ago, and two days ago became bigger and painful. And also does not shrink when he is lying down. There was no history of abdominal distension, nausea, and vomiting. The patient has been unable to defecate nor flatus since two days ago. Urination is said to be normal. There's no history of fever. The patient had no prior injury, history of abdominal surgery, hepatitis infection, hepatic cirrhosis and ascites, malignancy, alcohol abuse, or other medical history associated with his current condition.

On general physical examination, the patient's vital sign was within normal limit, he had no fever, and he was fully alert. Examination of the abdomen showed no distention, darm steifung, nor darm contour. There's no sign of portal hypertension. Bowel sounds were moderately decreased, about 6 times/minute. On the umbilical region, there's an area of swelling mass about 7 cm in diameter, mobile, rubbery consistency, and does not shrink when lying down. The skin over the swelling area and around the umbilicus was erythematous. It felt warm, and there was tenderness. Transillumination was negative (Figure 1). From rectal examination revealed no abnormality.



Figure 1. The clinical presentation showed a mass in the umbilical region. Diameter about 7 cm, mobile, rubbery consistency, and does not shrink when lying down. The skin over the swelling area and around the umbilicus was erythematous.

A simple radiology examination was done. The Plain Abdominal X-ray showed partial small bowel obstruction (Figure 2). Several laboratory examinations were done, and it showed only an

increase in leukocytes (WBC  $21.4 \times 10^3$ mg/dl), and other parameters within normal limits. There's no evidence of liver, kidney, or metabolic abnormality.



Figure 2. A plain Abdominal X-ray showed a partial small bowel obstruction.

After relevant investigation patient was assessed with total obstructive ileus due to suspected incarcerated umbilical hernia strangulated umbilical hernia and taken to the operation theatre for laparotomy resection and reanastomose ileum and repair hernia defect with mesh. Prior to surgery, the patient received antibiotic therapy with Cefazolin 2gr intravenous, and the decompression Nasogastric Tube (NGT) was installed. On exploration, it was found necrotic ileum along 15 cm and performed resection,

followed by end-to-end anastomosis (Figure 3). After the surgical procedure, the patient's hemodynamics was stable. Nasogastric Tube (NGT) production was minimal (showed brown fluid). Therapy given after surgery includes Intra Venous Fluid Drip Ringer Lactate: Dextrose 5%: Amino-fluid 1:1:1 in 24 hours, Ceftriaxone 2gr intravenous every 24 hours, Metronidazole 500mg intravenous every 8 hours, Omeprazole 40mg intravenous every 12 hours, Morphine 20mg drip in 24 hours intravenous.



Figure 3. Durante operation: it was found necrotic ileum along 15 cm and performed resection, followed by end-to-end anastomosis.

### 3. Discussion

A hernia is the abnormal bulges or openings in the fascia of the abdominal wall, and it can be found at sites of anatomic weakening part, commonly on the anterior abdominal wall (umbilical) and groin regions (inguinal, femoral). Umbilical hernias are relatively common in adults, and they tend to be acquired defects (> 90%). They occur most frequently in the fifth or sixth decades of life, and the incidence is slightly higher in women than men.<sup>10</sup> In this case, the patient is 51 years old male with a noted recurrent bulge at his umbilicus about one year ago.

Predisposing factors for the development of umbilical hernias in adults are a condition that causes weak tissue strength, such in patients with collagen vascular disease and connective tissue disorders (Marfan syndrome, Ehlers Danlos); increased abdominal pressure such as in multiple pregnancies, obesity, hepatic cirrhosis with ascites, large abdominal tumors, straining due to constipation, chronic obstructive pulmonary disease (COPD), or chronic cough; people who engage in heavy lifting regularly also suggest at increased risk of hernia formation even still controversial.<sup>6</sup> In this case, predisposing factors have not been identified clearly. The patient had no prior injury, heavy lifting, history of abdominal

surgery, hepatitis infection, hepatic cirrhosis and ascites, malignancy, alcohol abuse, or other medical history associated with his current condition.

Hernias are classified as reducible, incarcerated, and strangulated based on several clinical features. If the contents within the hernia can be placed intra-abdominally through the layers of the abdominal wall, it is described as reducible. Meanwhile, when the contents of the hernia are not able to be reduced, it defines as incarcerated hernia. If the hernia contents are ischemic due to a compromised blood supply, it is described as a strangulated hernia.<sup>1</sup> The patient with an umbilical hernia may present with symptoms of bowel obstruction when incarcerated exist, including nausea, vomiting, and obstipation. If a strangulated hernia occurs and bowel ischemia is present, the patient will have severe pain and may present with sepsis.<sup>9</sup> In this case, the patient felt sharp, non-radiating pain in the left abdominal region with noted a recurrent bulge at his umbilicus about one year ago, and since two days ago become bigger and painful, and it also does not shrink when he is lying down. The patient has been unable to defecate or flatus since two days ago. It indicated that this patient presents the symptoms of bowel obstruction and is not reducible.

On general physical examination, the patient with a strangulated hernia may present with the sign of sepsis (hypotension, tachycardia).<sup>9</sup> In this case, the patient's vital sign was within normal limit, he had no fever, and he was fully alert. Even in this patient, the hemodynamic was stable, and the suspicion of a strangulated hernia could not be excluded. It is important to inspect the skin overlying the hernia visually before palpating the abdominal wall. Any appearance of erythematous or dusky skin concerns a possible strangulated hernia. If skin changes are noted, an emergent surgical consult should be obtained before attempting to reduce the hernia.<sup>1</sup> In this case, on the umbilical region, there's an area of swelling mass about 7 cm in diameter, mobile, rubbery consistency, and does not shrink when lying down. The skin over the swelling area and around the umbilicus was erythematous. It felt warm, and there was tenderness. Because of that, the patient is suspected of experiencing strangulated hernia. When evaluating a patient for an asymptomatic hernia, it is essential to ask the patient to increase abdominal pressure via a Valsalva maneuver. The patient should be evaluated in both the sitting and standing position. The physical examination should include an evaluation to find out the risk factors of the hernia, such as the presence of hepatic cirrhosis and ascites. Umbilical hernias occur in more than 20% of patients with hepatic cirrhosis and ascites. They are generally recognized as being the result of increased intraabdominal pressure causing herniation of abdominal contents through the congenital patent ring.<sup>11</sup>

In addition to the patient's history and careful physical examination, additional examinations such as laboratory and imaging studies may be helpful in establishing the diagnosis. Complete blood count and the basic metabolic panel should be checked for leukocytosis and metabolic abnormalities. Imaging studies such as ultrasound are the best initial test in determining whether a hernia is present. A CT abdomen can help delineate anatomy and determine if the bowel is strangulated within the hernia. MRI is a

more sensitive test than a CT scan in diagnosing occult hernias, but it is not as useful in the acute setting. Another technique that is useful to diagnose occult hernias is diagnostic laparoscopy, although this is not usually necessary.<sup>12</sup> In this case, several laboratory examinations were done, and the results showed only an increase in leukocytes (WBC 21.4x10<sup>3</sup> mg/dl) and other parameters within normal limits. There's no evidence of liver, kidney, or metabolic disease. The increase of leukocytes reinforces the suspicion of a strangulated hernia.<sup>13,14</sup> In this case, the Plain Abdominal X-ray examination was chosen compared to the others because, from the clinical point of view, it was very clear that a hernia had occurred. A plain Abdominal X-ray, in this case, showed a partial small bowel obstruction.

Management of the patient with a hernia depends on the patient's condition. If there is a bowel obstruction present, consider placing a nasogastric tube for decompression and ensure the patient has appropriate fluid resuscitation. If there is a suspicion of bowel necrosis or perforation, broad-spectrum antibiotics should be started. For patients with moderate to severe symptoms who are healthy enough to undergo surgery, surgical repair is indicated.<sup>15,16</sup> For an older patient who has multiple comorbidities and a relatively asymptomatic hernia, a watchful waiting approach may be warranted due to the low risk of strangulation. For an acutely incarcerated hernia without a bowel present, manual reduction can be attempted. For strangulated hernia demands emergency surgery. The main goal in these patients should be to reduce the systemic toxin load from the gangrenous herniated tissue.<sup>3</sup> If nonviable but not yet perforated, has not affected more than 50% of the circumference and not extended to the mesenteric border, Horbach recommends an invagination procedure without opening the intestine, i.e., the gangrenous area is invaginated, and margins are sutured together. If a nonviable bowel wall is more than 50% of the circumference and if it extends into the mesenteric border, then resection of the gangrenous segment and anastomoses is required.<sup>1,3</sup>

In this case, prior to surgery, the patient received antibiotic therapy with Cefazolin 2gr intravenous, and the decompression Nasogastric Tube (NGT) was installed. Resection ileum surgery was performed due to necrotic ileum along 15 cm was found, and then followed by end-to-end anastomosis.

After successful hernia repair, there is always the potential for recurrence. Modifiable patient risk factors for recurrence are an important thing to do. Overall mortality and prognosis are influenced by whether the surgery was emergent or elective. Mortality is increased to up to 3% with emergency surgery for strangulated bowel, notably when bowel resection is performed.<sup>9</sup>

#### 4. Conclusion

Umbilical hernias are relatively common in adults, and >90% tend to be acquired defects. If a strangulated hernia occurs and bowel ischemia is present, the patient will have severe pain and may present with sepsis. It is associated with a high rate of complications and mortality. Overall mortality and prognosis of hernia are influenced by whether the surgery was emergent or elective.

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