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Hernia Reduction

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Author: Ajita R Shah, MD; Chief Editor: Kurt E Roberts, MD [more...](#)

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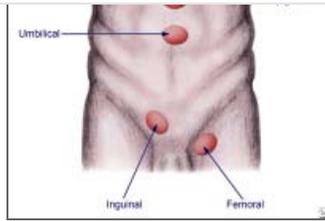
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Variations of hernia type and location.

Groin

- Indirect inguinal: Bounded by the inguinal (Hesselbach) triangle, an indirect inguinal hernia passes through the internal inguinal ring. It is the most common hernia subtype and is more commonly seen in males.
- Direct inguinal: This type of hernia is similarly bounded by the inguinal triangle, but it passes directly through the muscular and fascial wall of the abdomen. It carries a minimal risk of incarceration.
- Femoral: Originating below the inguinal ligament, a femoral hernia passes through the transversalis fascia and through the femoral canal. It presents a high risk of incarceration.^[4]

Anterior

- Umbilical: This type of hernia, shown below, is seen traversing the fibromuscular ring at the umbilicus. Commonly seen in infants, it usually resolves by the age of 5 years. Repair is indicated when an umbilical hernia is seen in older

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children or adults, is larger than 2 cm, or is incarcerated.^[5]



A 50-year-old man presents with recurrent umbilical hernia, which was reduced in the emergency department.

- **Epigastric:** An epigastric hernia is a midline hernia that passes through the linea alba.
- **Spigelian:** This rare type of hernia is located at the lateral edge of the rectus abdominis and passes through the semilunar line.

Manual reduction classification

For the purposes of manual reduction, hernias are best classified into 3 groups: those that are (1) easily reducible, (2) incarcerated, or (3) strangulated.^[6] This classification also helps direct treatment.

Easily reducible

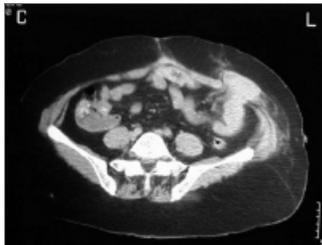
If a hernia is easily reducible, the abdominal contents can easily be returned to their original compartment. Reduction not only allows symptomatic relief for patients but also reduces the risk of future incarceration.^[4]

- **Asymptomatic:** A recent large prospective trial suggests that in patients who are minimally symptomatic, nonoperative treatment can produce outcomes similar to those experienced by minimally symptomatic patients who undergo surgical repair.^[7]
- **Symptomatic:** Reduction helps to alleviate symptoms, but elective surgical repair is usually warranted for long-term management.

Incarcerated

An incarcerated hernia cannot easily be returned to its original compartment. Overlying skin should appear to be normal, the contents should not be tense, and bowel sounds can sometimes be heard. The incarcerated tissue may be bowel, omentum, or other abdominal contents. A smaller aperture of herniation and adhesions can precipitate incarceration. An incarcerated hernia can often be reduced manually, especially with sufficient anesthesia.^[8, 9]

- **Obstructing:** A hernia is one of the 3 most common causes of obstruction. In addition to causing signs of obstruction, an obstructed hernia has a more tense appearance than a nonobstructed hernia, and radiographs may show bowel shadows at the site of herniation. A CT scan is shown below.



CT scan of a 64-year-old woman with vague abdominal pain of 2 days' duration. Physical

examination revealed a tender palpable mass in the left lower quadrant. CT scan reveals an incarcerated ventral hernia.

- Not reducible: Even with proper sedation and technique, not every hernia can be manually reduced. In this case, surgical reduction is more urgent to prevent strangulation.^[10, 11]

Strangulated

A strangulated hernia, shown below, is a surgical emergency in which the blood supply to the herniated tissue is compromised. Strangulation stems from herniated bowel contents passing through a restrictive opening that eventually reduces venous return and leads to increased tissue edema, which further compromises circulation and stops the arterial supply. Such a hernia may be recognized in early stages by severe pain and by tenderness, induration, and erythema over the herniation site. As tissue necrosis ensues, findings may include leukocytosis, decreased bowel sounds, abdominal distension, and a patient who appears to be toxic, dehydrated, and febrile. Mortality is high and treatment should be initiated immediately.^[12]



Erythematous edematous left scrotum in a 2-month-old boy with a history of irritability and vomiting for 36 hours. Local signs of this magnitude preclude reduction attempts.

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