

# Pediatric Abdominal Wall Defects

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## KEYWORDS

• Pediatric hernia • Umbilical hernia • Inguinal hernia • Gastroschisis • Omphalocele

## KEY POINTS

- Indirect inguinal hernias occur in 4% of infants, and are more common in males and on the right side. Risk of incarceration is around 15%. Today pediatric inguinal hernias are frequently repaired laparoscopically or with laparoscopic guidance. These newer techniques have recurrence rates that are approaching the recurrence rate of open repair (1%). In neonates, hernias should be repaired before discharge from the hospital.
- Umbilical hernias occur in 10% to 30% of children. The fascial defect will continue to close over the first several years of the child's life. Other forms of abdominal wall hernias (femoral, epigastric, Spigelian) occur less frequently.
- Gastroschisis occurs in 3 of every 10,000 births. There is no overlying sac in gastroschisis, and the condition is not typically associated with congenital defects. A fibrous peel coats the bowel and makes manual reduction more difficult. Repeated trips to the operating room and silos can be used to achieve closure over time.
- Omphalocele occurs in 2 of every 10,000 births. This condition is more typically associated with congenital defects such as Beckwith-Wiedemann syndrome, pentalogy of Cantrell, bladder/cloacal extrophy, and Down syndrome. Bridging mesh can be used to close larger defects.

## INTRODUCTION

Abdominal wall defects, in the form of hernias (inguinal, epigastric, umbilical, and so forth), gastroschisis, and omphalocele, make up a significant portion of a pediatric surgeon's operative practice. This article presents an overview of these pediatric conditions.

## INGUINAL HERNIAS

Inguinal hernia repair is the most frequently performed pediatric surgical operation.

### *Epidemiology*

The overall incidence of pediatric inguinal hernia is approximately 4%.<sup>1</sup> Inguinal defects are 10 times more common in males than in females.<sup>2</sup> Prematurity is also

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Disclosures: None.

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associated with an increased incidence of inguinal hernia. Thirty percent of infants weighing less than 1 kg have inguinal hernias.<sup>3</sup>

Right-sided hernias predominate, accounting for 60% to 75% of inguinal hernias. This predominance is attributed to the later descent of the right testicle in males.<sup>1</sup> Bilateral hernias occur in 15% to 20% of cases. Female sex, prematurity, and left-sided inguinal hernias are risk factors for bilateral defects.<sup>4</sup>

### ***Embryology and Anatomy***

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In the third month of gestation the processus vaginalis develops from the peritoneal lining. In the seventh to ninth month, the testes pass through the processus as it elongates along the course of the gubernaculum. The testes end up in the scrotum and the processus typically obliterates. A congenital inguinal hernia results when the proximal processus vaginalis fails to obliterate, allowing fat, bowel, or other organs to enter the processus and the surrounding inguinal canal.<sup>5</sup>

In females, the canal of Nuck corresponds to the processus vaginalis. This pouch communicates with the labia majora and typically closes in the seventh month of gestation.<sup>1</sup>

### ***Clinical Presentation and Examination***

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Most inguinal hernias are recognized as intermittent bulging in the groin, scrotum, or labia. Such bulging is exacerbated by the increased intra-abdominal pressures seen when an infant cries or strains to have a bowel movement. Often a hernia is not seen on physical examination in the office despite the parent's description of a groin bulge that comes and goes. Many surgeons operate on this history alone. A recent and novel study suggests that parents take digital pictures of the bulge to document its presence.<sup>6</sup>

Examination of a hernia begins by identifying the testes within the scrotum. If no testis is found in the scrotum, the bulge may be an undescended testicle. The external ring, lateral to the pubis, is then palpated with a single finger. The spermatic cord and associated structures can be felt by rolling one's finger over them. Thickening of the cord structures or the "silk glove sign" signals the presence of a hernia sac. This clinical sign has a reported sensitivity of 91% and specificity of 97.3%.<sup>7</sup> Often, no bulge is initially seen. It is then helpful to induce increased intra-abdominal pressure by asking the child to perform a Valsalva maneuver or by making him/her laugh or cry.

### ***Risk of Incarceration***

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Incarcerated inguinal hernias occur in 5% to 15% of pediatric hernia presentations. The rate of incarcerated hernia is up to 30% in infants.<sup>8,9</sup> Incarcerated hernias can typically be reduced with taxis.

Bowel entrapment typically occurs at the internal ring.<sup>1</sup>

Any inguinal hernia that cannot be reduced should be promptly taken to the operating room. The process of intestinal strangulation and infarction can develop in as little as 2 hours.<sup>1</sup>

### ***Diagnostic Imaging***

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Although rarely used in the United States, Groin ultrasonography can be used to augment the physical examination for inguinal hernias. The finding of a hypoechoic structure measuring greater than 6 mm in the mid-inguinal canal is consistent with the presence of a hernia.<sup>10</sup> In one study, in-office ultrasonography increased the diagnostic accuracy from 84% to 97.9%.<sup>11</sup>

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