

# Ventral Hernia

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## Definitions and Descriptors

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### Definitions

- Ventral Hernia: Hernia of the Anterior Abdominal Wall
- Types:
  - *Incisional Hernia*: Hernia Through a Prior Incision
  - *Umbilical/Periumbilical Hernia*: Hernia Through the Umbilical Ring
  - *Epigastric Hernia*: Hernia Between the Umbilicus and Xiphoid Along the Linea Alba
  - *Spigelian Hernia*: Hernia Along the Spigelian Line (Aponeurotic Band at Lateral Border of the Rectus Abdominis)
  - *Arcuate Line Hernia*: Hernia Through the Arcuate Line
  - *Posterior Rectus Sheath Hernia*: Hernia Through the Posterior Rectus Sheath
- *Rectus Abdominis Diastasis*: Separation of Rectus Abdominis Pillars
  - Fascia Intact (**Not a True Hernia**)
  - \*See Rectus Abdominis Diastasis (RAD)



Large Ventral Hernia <sup>8</sup>

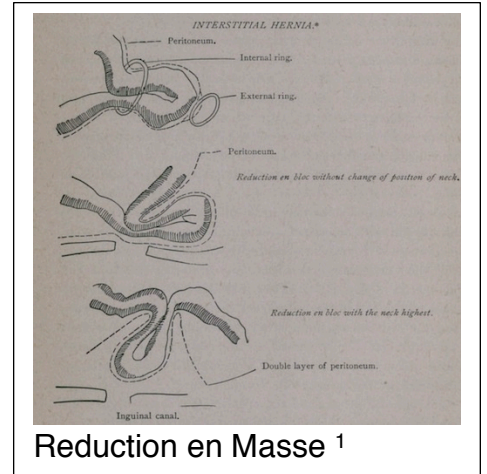
## Basic Descriptors

- *Reducible*: Able to Reduce/Push the Hernia Contents Back into the Abdominal Cavity
- *Incarcerated*: Unable to Reduce/Push the Hernia Contents Back into the Abdominal Cavity
  - Causes a Risk of Strangulation
- *Strangulated*: Hernia Blood Supply is Obstructed
  - Causes a Risk of Ischemia and Necrosis (Surgical Emergency)

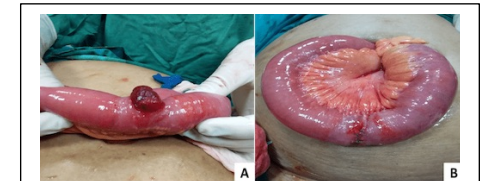
## Additional Descriptors

**MN**

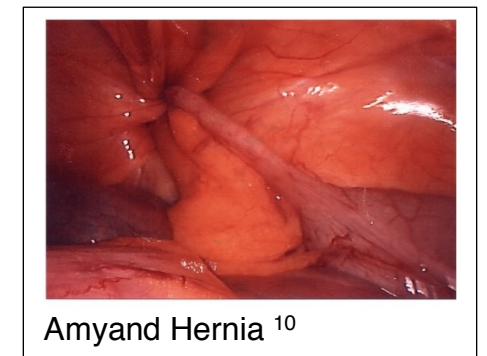
- *Reduction en Masse*: Hernia Sac is Reduced but the Bowel is Still Incarcerated within the Reduced Sac <sup>1</sup>
  - Causes a Risk of Progression to Ischemia and Necrosis Despite Reduction
  - “Classically” Describing an Inguinal Hernia <sup>1</sup>
- *Richter Hernia*: Only the Antimesenteric Border of the Bowel Wall is Herniated <sup>2</sup>
  - Also Described as a “Partial Enterocoele” <sup>2</sup>
  - May Not Cause Obstruction as Bowel Contents Can Pass Through the Intraperitoneal Portion of the Bowel
  - High Risk of Incarceration and Strangulation of the Herniated Portion
- *Interparietal Hernia*: Hernia Between the Layers of the Anterior Abdominal Wall <sup>3</sup>
  - Most Commonly Due to an Incisional Hernia
- *Littre Hernia*: Hernia Contains a Meckel Diverticulum <sup>4</sup>
- *Amyand Hernia*: Hernia Contains the Appendix <sup>5</sup>
  - “Classically” Describing an Inguinal Hernia
- *Sliding Hernia*: A Retroperitoneal Organ is Included as Part of the Hernia Sac <sup>6</sup>
  - Most Common Organs:
    - Males: Sigmoid Colon and Cecum
    - Females: Ovary and Fallopian Tube (Ligate the Round Ligament and Return the Ovary at Surgery)



Reduction en Masse <sup>1</sup>



Richter Hernia <sup>9</sup>



Amyand Hernia <sup>10</sup>

## Size <sup>7</sup>

- Small: < 1 cm
- Medium: 1-4 cm
- Large: > 4 cm

# Types of Hernias

## Incisional Hernia

- Definition: Hernia Through a Prior Incision
  - *Port-Site Hernia*: Incisional Hernia Through a Prior Port Site
- Develop in **10-15%** of Incisions <sup>11</sup>
  - Highest for Midline Incisions (3-20%) <sup>12,13</sup>
  - Pfannenstiel Incisions are Significantly Lower Risk (0-2%) <sup>14</sup>

## Umbilical/Periumbilical Hernia

- Definition: Hernia Through the Umbilical Ring
- More Common in Women (3:1 Ratio)
  - Incidence Among Pregnancies: 0.08% <sup>15</sup>
- *Proboscoïd (Elephant-Trunk) Hernia* <sup>16</sup>
  - Definition: A Large Umbilical Hernia with Excessive Stretching of the Skin Resembling a Trunk
  - Named After the Nose of a Proboscis Monkey
  - Usually At Least a Few cm in Diameter



## Epigastric Hernia

- Definition: Hernia Between the Umbilicus and Xiphoid Along the Linea Alba
- Due to a Weakened Linea Alba <sup>17</sup>
  - Congenitally from Lack of Decussating Fibers
  - Forceful Diaphragmatic Contractions Transmitted to the Abdominal Wall
  - Perforation by Vascular Lacunae
- Ventral Hernias are More Common Above the Umbilicus Than Below
  - Obliterated Umbilical Vessels & Urachus Reinforce Abdominal Wall Below
- Up to 20% Have Multiple Defects

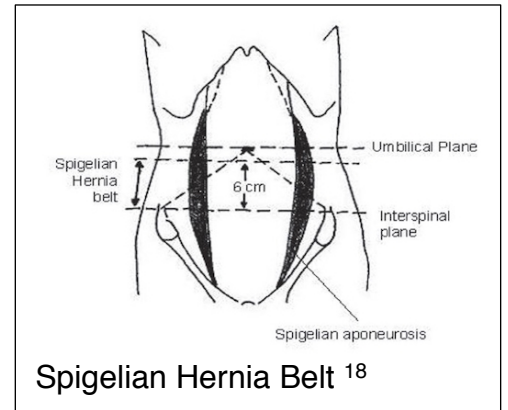


## Spigelian Hernia

- Definition: Hernia Along the Spigelian Line (Aponeurotic Band at Lateral Border of the Rectus Abdominis)
- Most are Interparietal Between the Internal and External Obliques
  - The Spigelian Line is Composed of Fibers from the Internal Oblique and Transversus Abdominis Aponeuroses
- Most Common at the Junction of the Arcuate Line

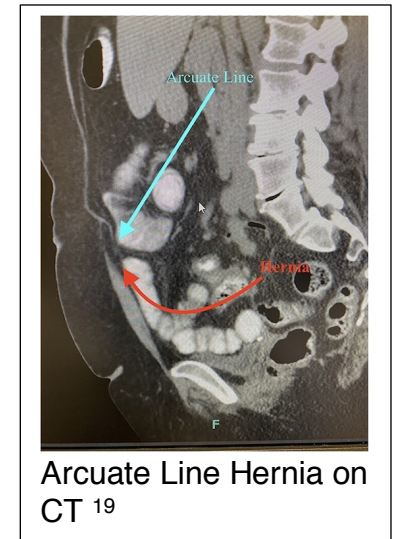


- “Spigelian Hernia Belt” – Horizontal Area Across the Abdominal Wall Bounded by the Interspinous Plane Inferiorly and 6 cm Above <sup>18</sup>
  - Interspinous Plane – Transverse Plane Between the Anterior Superior Iliac Spines
  - Due to Variable Position of the Arcuate Line
  - Contains 85-90% of Spigelian Hernias <sup>18</sup>
- Often Difficult to Palpate and Can Be Confused with a Rectus Sheath Hematoma – Generally Require Imaging for Diagnosis
- Tend to Be Small with a Narrow Neck and High Risk of Incarceration/Strangulation



### Arcuate Line Hernia

- Definition: Hernia Through the Arcuate Line <sup>19</sup>
  - Hernia Sac Ascends Upward Between the Posterior Aponeurotic Sheath and Rectus Abdominis Muscle
  - Defined as an Interparietal Hernia Within the Layers of the Abdominal Wall
  - Can Be Unilateral or Bilateral <sup>20</sup>
- The Majority are Asymptomatic Due to a Wide Hernia Orifice <sup>19</sup>
- Often Misdiagnosed as a Spigelian Hernia



### Posterior Rectus Sheath Hernia

- Definition: Hernia Only Through the Posterior Rectus Sheath <sup>21</sup>
  - Defined as an Interparietal Hernia Within the Layers of the Abdominal Wall
- Presents as a Mass Within the Rectus Muscle (Can Be Confused with a Rectus Sheath Hematoma)

## Risk Factors

### General Ventral Hernia Risk Factors <sup>17,25</sup>

- Extensive Physical Training
- History of Lifting or Pushing Heavy Objects (May Be Related to Occupation)
- Straining During Bowel Movements
- Coughing/Lung Disease
- Severe Vomiting
- Obesity
- Diabetes
- Smoking

- Steroid Use
- Older Age
- Male Sex (Umbilical Are More Common in Females)
- Pregnancy

### Incisional Hernia Risk Factors <sup>26,27</sup>

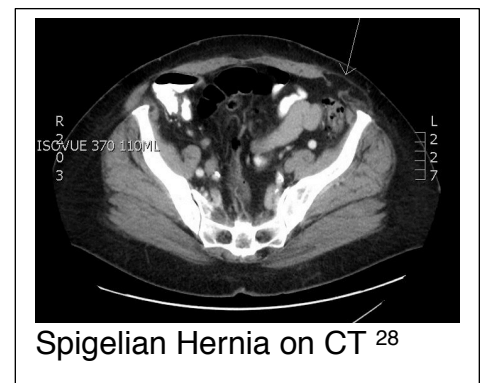
- Patient Factors:
  - Obesity – Possibly the Most Important Patient Factor
  - Malnutrition
  - Older Age
  - COPD
  - Diabetes
  - Smoking
  - Immunosuppression
  - Cystic Fibrosis
  - Connective Tissue Disorders
- Technical Factors:
  - Surgical Site Infection (Risk of Hernia Up to 25%)
  - Suboptimal Fascial Closure
    - **\*See Fascial Closure**
  - Vertical Midline Incisions (Compared to Transverse or Oblique Incisions)

## Presentation and Diagnosis

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### Presentation

- Abdominal Wall Bulge
- Abdominal Pain and Discomfort
  - May be Worsened by Coughing or Straining
- Symptoms of Bowel Obstruction
  - Nausea and Vomiting
  - Constipation
- Overlying Skin Can Develop Erythema, Ischemia, or Ulceration Due to Excessive Pressure



### Diagnosis

- Generally a Clinical Diagnosis
  - Small Hernias May Be Difficult to Palpate
- Imaging May Be Required if Uncertain
  - US – More Cost Effective and Allows Dynamic Assessment with Valsalva (Operator Dependent)
  - CT – Allows Better Evaluation of Large and Complex Defects

# Treatment

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## Treatment <sup>7,29</sup>

- *Asymptomatic*: Observe
  - Consider Repair for Asymptomatic Patients Based on Patient Preference
  - All Spigelian Hernias Should be Repaired Due to Risk of Incarceration/Strangulation
- *Symptomatic*: Surgical Repair
  - **\*See Ventral Hernia Repair (VHR)**
  - Acutely Incarcerated or Strangulated Hernias Require Emergent Repair
    - Chronically Incarcerated Hernias Can Be Managed by Observation or Elective Repair
  - Mesh Indications:  $\geq 1\text{-}2\text{ cm}$  (In General, if a Mesh Can Fit Through the Defect it Should be Used)

## Surgical Repair in the Obese <sup>30,31</sup>

- Obese Patients Have Significantly Higher Risk of Complications and Recurrence
- Treatment Approach:
  - Overweight (BMI < 30): Elective Repair
  - Obese (BMI 30-40): Elective Repair or Staged Repair
  - Severely Obese (BMI > 40): Staged Repair
- Staged Repair:
  - Start with Weight Loss by Bariatric Surgery or Multidisciplinary Medical Management
  - Delay Hernia Repair Until Weight Loss is Achieved
- May Consider Combined Surgery (Hernia Repair and Bariatric Surgery) if Both are Amenable to Laparoscopic Repair for Severely Obese Patients <sup>30</sup>
- Minimally Invasive Approaches are Generally Preferred – Decreased Risk of Wound Complications

## Component Separation <sup>32</sup>

- **\*See Abdominal Wall Reconstruction/Component Separation**
- Indications:
  - Multiple Defects Unable to Close with Mesh
  - Large Defect Unable to Close Primarily
  - Large Recurrence that Failed Suture Closure
  - Giant Omphalocele
- Relative Contraindications:
  - Extensive Destruction of Abdominal Wall Components
  - Compromise of Epigastric Arterial Supply (DIEP Flap, etc.)
  - Gross Contamination or Active Infection

## Surgical Approach <sup>33-36</sup>

- Choice of Approach is Often Surgeon Dependent with Minimally Invasive Techniques Evolving
- Open Surgery:
  - Preferred for Small (< 1 cm) or Very Large (> 10 cm) Defects
  - Preferred for Loss of Abdominal Domain
  - Preferred if Bowel is Compromised with Necessary Resection – Incarceration Alone Can Be Done Laparoscopically
- Minimally Invasive (Laparoscopic or Robotic):
  - Decreased Risk of Wound Complications – Particularly in Obese Patients
    - Includes Hematoma, Seroma, and Surgical Site Infection
  - Decreased Pain
  - Decreased Length of Stay
  - Provides Better Visualization for Multiple Defects (Avoids Larger-Than-Needed Incisions)
- Similar Recurrence Rates
- Robotic Repairs Have Longer Operative Times and Higher Costs

## Special Populations

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### Hernia in Pediatrics

- **\*See Abdominal Wall Hernia in Pediatrics**

### Umbilical Hernia in Pregnancy <sup>37</sup>

- Asymptomatic: Observe
- Symptomatic: **Delayed Repair After Delivery**
  - May Consider Elective Repair in the Second Trimester
  - May Also Consider Concomitant Repair During C-Section
- Indications for Emergent Repair:
  - Acutely Incarcerated
  - Strangulated
  - Skin Ulceration

### Hernia with Ascites and Cirrhosis

- **\*See Hernia with Cirrhosis**

# Mnemonics

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## Hernia Descriptors

- Litre-Little: “Little” Ones Have Meckel’s (Most Common Before Age 2)
- A-A: Amyand-Appendix

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