Inguinoscrotal Swelling in Children

Processus vaginalis is a peritoneal diverticulum that extends through the internal ring at approximately 3 months gestation. As the testis descends between the seventh and ninth months of gestation, a portion of the processus vaginalis attaches to the testes and is dragged into the scrotum with the testes.

The portion of the processus vaginalis surrounding the testis becomes the tunica vaginalis. The remainder of the processus vaginalis obliterates, thereby eliminating the communication between the peritoneal cavity and the scrotum.

Failure of obliteration or incomplete obliteration of the processus vaginalis is the **underlying pathophysiology of the development of hernias and hydroceles**

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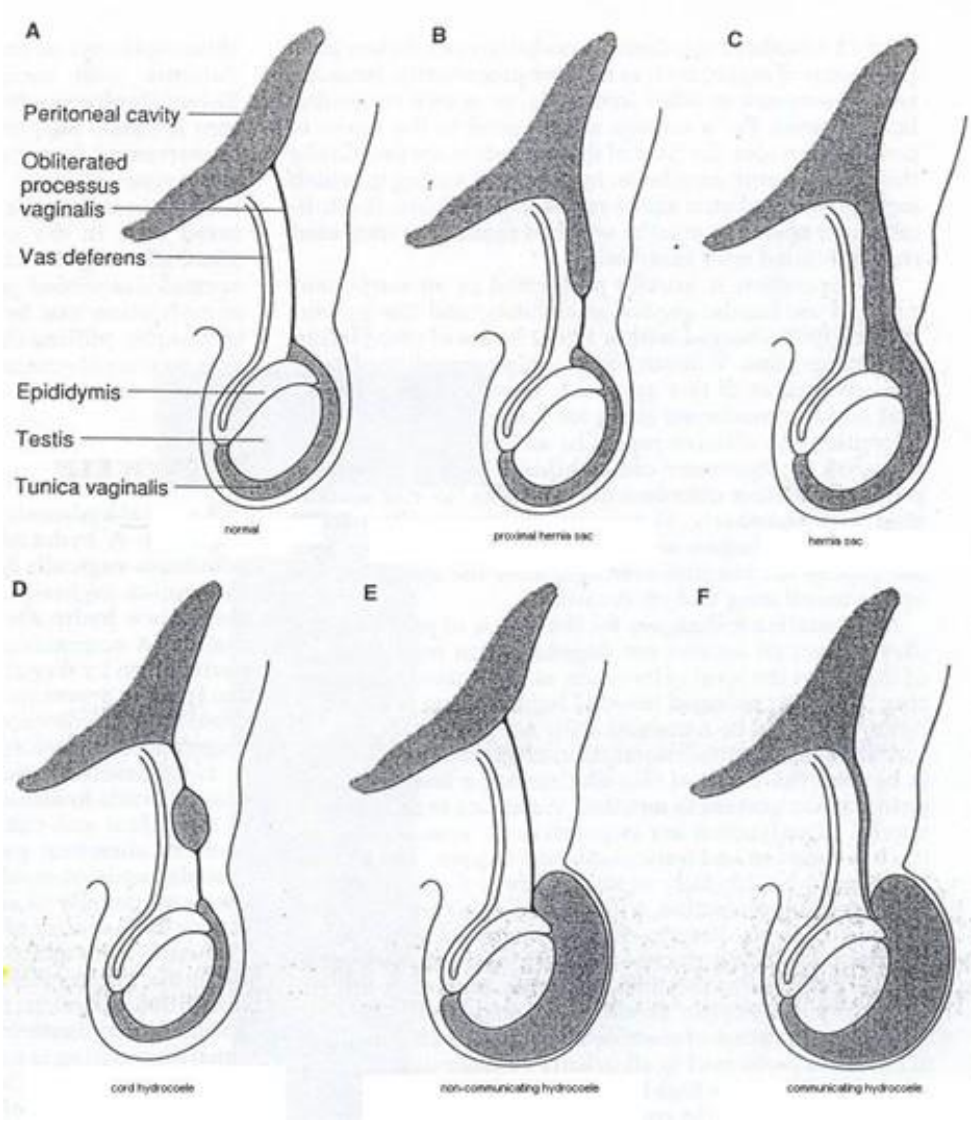
A hydrocele occurs with incomplete obliteration of the processus vaginalis so that fluid accumulates around the testicle or the cord structures. This fluid may or may not communicate with the peritoneal cavity.

A hernia occurs as a result of distal obliteration of the processus vaginalis with proximal patency or complete failure of obliteration so that both fluid and bowel may be present in the sac.



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Almost all inguinal hernias in infants and children are indirect.

The hernia sac is located anterior and medial to the spermatic cord structures.

The incidence of groin hernias in infants and children is 1-5%.

Boys outnumber girls 6-10:1

Right-sided hernias are more common because the right testis descends later than the left testis; therefore, the right processus vaginalis obliterates at a later date than the left. (R 60%, L 30%, Bilateral 10%)

Consequently, patients who present with a left-sided hernia have a higher incidence of an occult right sided hernia.

The risk of incarceration exceeds 60% during the first 6 months of life.

Most hernias are found either by parents or during a well-baby or preschool check.

Most patients have a history of an intermittent bulge in the groin or scrotum, especially with crying or straining. Most are asymptomatic.

Symptoms and signs of an incarcerated inguinal hernia:

- The patient may be irritable and complain of pain in the groin.
- Signs of intestinal obstruction, including abdominal distention, vomiting, and obstipation, may follow.
- Physical examination reveals a tender, sometimes erythematous, irreducible mass in the groin.
- With strangulation of the bowel, blood may be seen per rectum.

Most commonly the bowel become incarcerated in an inguinal hernia Sac.
In females, the ovary or fallopian tubes frequently become incarcerated.

Amyand's hernia: presence of appendix in an inguinal hernia sac.
Littre's hernia: protrusion of a Meckel's diverticulum into the hernial sac.
Transillumination is not reliable sign

Differential diagnosis of an inguinal hernia:
Hydrocele
Cryptorchidism
Testicular torsion
Torsion of the appendix testis
Inguinal lymphadenopathy

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What technique is used to repair pediatric hernias?

High ligation of the sac (herniotomy)

When should groin hernias be repaired?

- In premature infants, groin hernias should be repaired just before discharge from the NICU
- Other infants should be scheduled electively within about 1 month
- Incarcerated hernias that can be reduced in the emergency department should be repaired within 24-48 hours.
- Incarcerated hernias that cannot be reduced in the emergency department should be repaired emergently.

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Complications of groin hernia repair

- Bleeding
- Recurrence (0.5-1%)
- Infection (< 1%)
- Iatrogenic cryptorchidism
- Injury to cord structures (< 2%)

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HYDROCELE

The presence of fluid in the scrotum or inguinal canal in boys or in the inguinal/labial area in girls

Communicating and non communicating

Indications for surgery:

- Non communicating
- Communicating with failure to resolve by 1–2 years of age.
- Unable to rule out hernia (bowel) component.

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Cryptorchidism

- Cryptorchidism ("hidden testis") is the most common congenital genitourinary anomaly in males
- Results when the testis does not descend into its normal intrascrotal position during development. 80% found in inguinal canal.
- Unilateral (90%) or bilateral (10%);
- 70% of unilateral cases occur on the right side.
- In full-term infants, the incidence is 2.7-5.9% at birth but decreases to 1.2-1.8% by 1 year of age.
- The incidence is 10-fold higher in premature infants.

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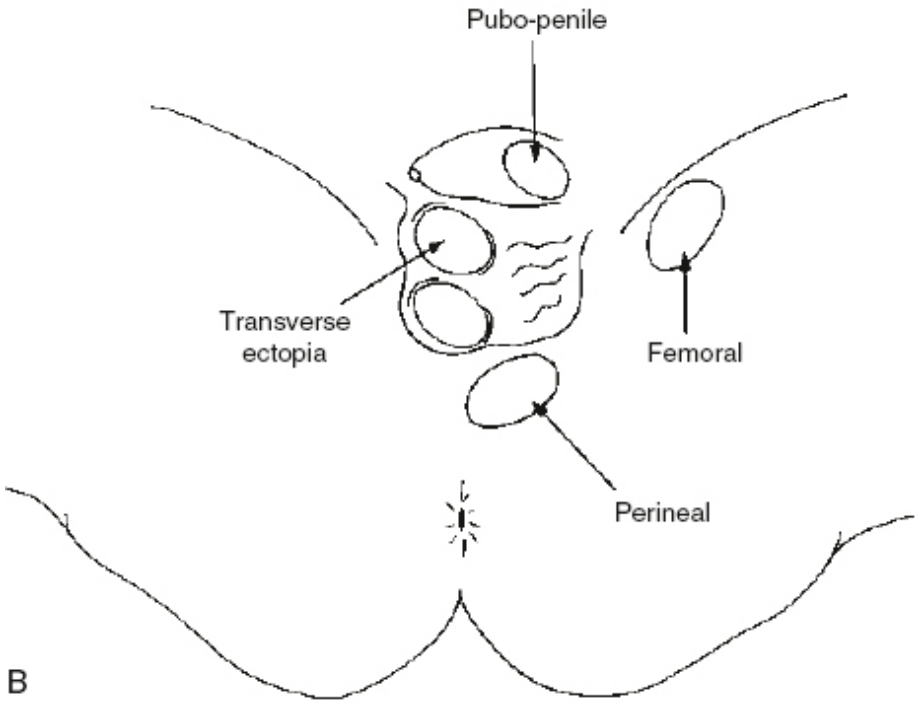
- **Ectopic testes**
  - Testes found outside of the line of normal descent
  - Can be found in femoral canal, perineum, contralateral scrotum, above the pubic bone



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- **Retractile testes**
  - Retraction of testicles in response to cold temperatures and protection from trauma
  - Later in childhood
  - Secondary to abnormal response to cremasteric muscle contraction
  - Can be brought down into the scrotum during physical examination

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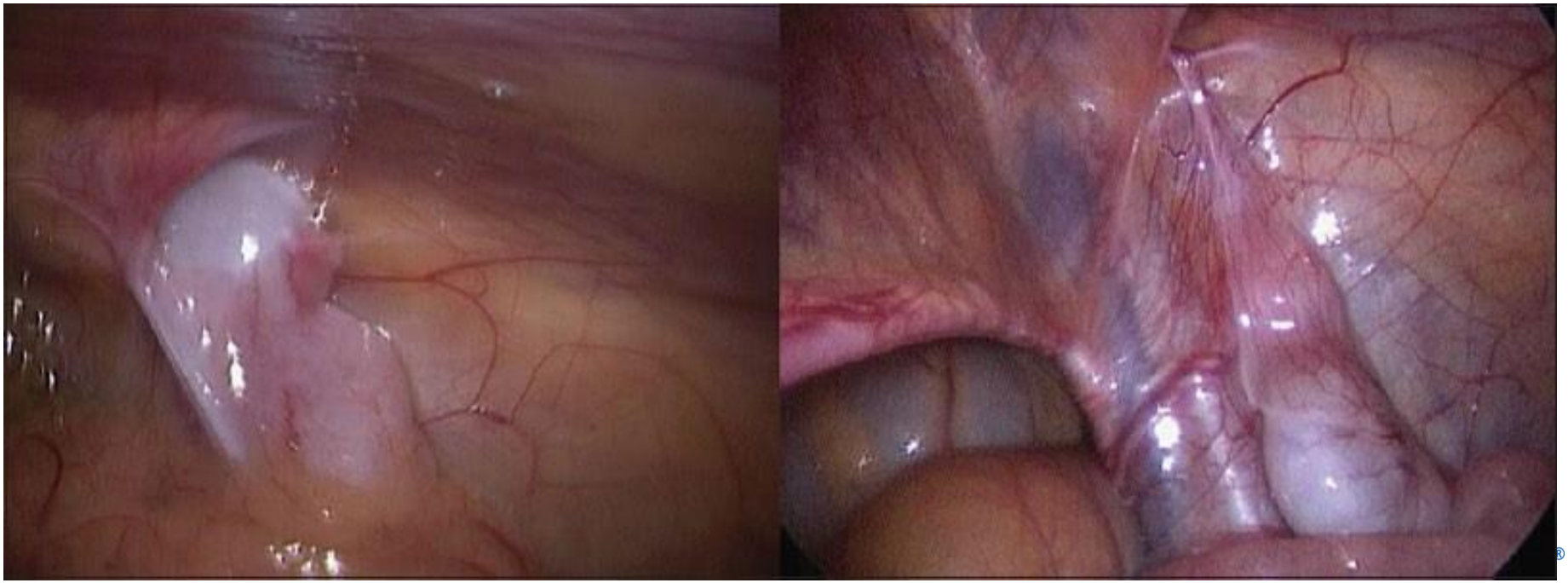
Diagnosis

- Clinical
- Ultrasound
- MRI
- Diagnostic laparoscopy



- **Management**
  - Preop
    - <6 months of age → monitor for descent
  - Operative
    - Orchiopexy between 6-9 months

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- **Hormonal therapy**
  - Testosterone – no longer used due to causing precocious puberty
  - hCG – 6% success rate
  - LHRH – 19% success rate
- **Hormonal therapy not recommended by the American Urological Association guidelines due to lack of response and long term efficacy**

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Indications for Surgery (Orchiopexy)

- All undescended testes in patients >6 months
  - Undescended testes at risk for:
    - Injury due to direct trauma
    - Epididymo-orchitis from repeated trauma
    - Sterility – 10% risk for unilateral and 38% for bilateral undescended testes
    - Malignancy

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Testicular Torsion

Twists of the spermatic cord, causing venous congestion, edema, and eventual arterial obstruction, which, if not treated, lead to gonadal necrosis.

Most cases occur in late childhood or early adolescence.

It is pediatric urologic emergency

Present as acute, sharp unilateral scrotal swelling and pain.

Palpation of the inguinal canal may reveal a thickened or twisted cord.

The affected testis is elevated within the hemiscrotum due to the twist (transverse and high-riding)

Absent cremasteric reflex, Pain improvement with upward scrotal support

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- **Intravaginal torsion: “**bell-clapper” deformity. Most commonly 12-18-year-olds. Testis does not have normal fixation within the scrotum, so has higher risk of twisting in the processus vaginalis.

- **Extravaginal torsion:** seen in neonatal torsion. Entire spermatic cord twists, including the processus vaginalis.

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Diagnosis

- Mainly clinical
- Nuclear scintigraphy
- Doppler sonography

However, urgent treatment of the patient believed to have testicular torsion should not be postponed

Differential Diagnosis

- Epididymitis (Fever and Pyuria)
- Orchitis (Fever and Dysuria)
- Appendiceal torsion (gradual pain, blue dot)
- Urethral stones
- Referred renal colic

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Treatment of testicular torsion

Surgery involves initial detorsion of the testis.

If the testis is viable, it is fixated within the tunica vaginalis

If the testis is nonviable, it should be removed.

In addition, contralateral testicular fixation should be performed to prevent future contralateral torsion.

Maximal success rates are obtained when surgery is performed within 6 hours of torsion.