HYDROCELE

Key Concepts

- Pathophysiology of hydrocele.
- Epidemiology of hydrocele.
- Clinical presentation of hydrocele.
- Investigations for scrotal swelling.
- Treatment of hydrocele

Abstract

Hydroceles is collection of fluid in tunica vaginalis. Hydroceles can be congenital or acquired. Hydroceles is assessed by testicular ultrasound the clinical features range from asymptomatic swelling to painful discomfort. Hydroceles in pediatric patients are treated with herniotomy. Acquired hydroceles can be managed by aspiration or surgery. Different methods of surgery are applied to treat surgically aspiration hydroceles. Surgical complication such as infection, hematoma can occur.

Key words: Hydrocele, Herniotomy, Lord’s Operation, Eversion of sac, Secondary Hydrocele.

ETIOLOGY & PATHOLOGY

Hydrocele is collection of fluid in persistant tunica vaginalis in males. It is collection of serous fluid resulting from a defect or irritation in the tunica vaginalis of the scrotum. Hydroceles also may arise in the spermatic cord in males or the canal of Nuck in females.

FREQUENCY

Hydrocele is estimated to affect 1% of adult men. More than 80% of newborn boys have a patent processus vaginalis, but most close spontaneously within 18 months of age.

Most hydroceles are congenital and are noted in children aged 1-2 years of age. The incidence of hydrocele is rising with the increasing survival rate of premature infants and with increasing use of the peritoneal cavity for ventriculoperitoneal (VP) shunts, dialysis, and renal transplants. Hydrocele is a disease observed only in males. Chronic or secondary hydroceles usually occur in men older than 40 years.

Hydrocele is bilateral in 7-10% of cases. Hydrocele often is associated with hernia,
especially on the right side of the body in infants and children.

ETIOLOGY
Most pediatric hydroceles are congenital; however, malignancy, infection, and circulatory compromise are possible causes of hydrocele.

Hydrocele of the cord is associated with pathologic closure of the distal processus vaginalis, which allows fluid pooling in the mid portion of the spermatic cord.

Communicating hydrocele is caused by failed closure of the processus vaginalis at the internal ring. Noncommunicating hydrocele results from pathologic closure of the processus vaginalis and trapping of peritoneal fluid. Adult-onset hydrocele may be secondary to orchitis or epididymitis. Hydrocele also can be caused by malignancy, tuberculosis and by tropical infections such as filariasis.

Testicular torsion may cause a reactive hydrocele in 20% of cases. The clinician may be mis-led by focusing on the hydrocele, which delays the diagnosis of torsion. Tumor, especially germ cell tumors or tumors of the testicular adnexa may cause hydrocele. Traumatic (ie, hemorrhagic) hydroceles are common. Ipsilateral hydrocele occurs in as many as 70% of patients after renal transplantation. Radiation therapy is associated with cases of hydrocele.

Exstrophy of the bladder may lead to hydrocele. Hydrocele may arise from Ehlers-Danlos syndrome. Hydrocele may result from a change in the type or volume of peritoneal fluid, like in patients undergoing peritoneal dialysis and those with a ventriculoperitoneal shunt.

PATHOPHYSIOLOGY
Embryologically, the processus vaginalis is a diverticulum of the peritoneal cavity. It descends with the testes into the scrotum via the inguinal canal around the 28th gestational week with gradual closure through infancy and childhood. Hydroceles are classified into three principal types.

CONGENITAL
These are also called a communicating (congenital) hydroceles. Patent processus vaginalis permits flow of peritoneal fluid into the scrotum. Indirect inguinal hernias are associated with this type of hydrocele.
ACQUIRED
It is also called noncommunicating hydrocele. Patent processus vaginalis is present, but no communication with the peritoneal cavity occurs.

HYDROCELE OF CORD
Closure of the tunica vaginalis is defective. The distal end of the processus vaginalis closes correctly, but the mid portion of the processus remains patent. The proximal end may be open or closed in this type of hydrocele.

SECONDARY HYDROCELE
Adult hydroceles are usually late-onset (secondary). Late-onset hydroceles may present acutely following local injury, infections, and radiotherapy; these may present chronically from gradual fluid accumulation. Morbidity may result from chronic infection after surgical repair. This type of hydrocele can adversely affect fertility.

PRESENTATIONS
ASYMPHTOMATIC
Most hydroceles are asymptomatic or subclinical. Onset, duration, and severity of signs and symptoms are evaluated. Relevant genitourinary (GU) history, sexual history, recent trauma, exercise, or systemic illnesses are identified.

SCROTAL SWEELING
Most common presentation is a painless enlarged scrotum.

SCROTAL DISCOMFORT
Sensation of heaviness, fullness, or dragging may be felt by the patient. Patients occasionally report mild discomfort radiating along the inguinal area to the mid portion of the back.

PAIN
Hydrocele usually is not painful; pain may be an indication of an accompanying acute epididymal infection. The size may decrease with recumbency or increase in the upright position. Chronically formed hydroceles appear to be larger in size than acutely formed ones.

SYSTEMIC SYMPTOMS
Fever, chills, nausea, or vomiting are absent in uncomplicated hydrocele. GU symptoms are absent in uncomplicated hydrocele.

Hydroceles are located superior and anterior to the testis, in contrast to spermatoceles, which lie superior and posterior to the testis.

The size and the palpable consistency of hydroceles can vary with position. Hydrocele usually becomes smaller and softer after lying down, it usually becomes larger and tenser after prolonged standing. Systemic signs of toxicity are absent. The patient is usually afebrile with normal vital signs. Abdominal or testicular tenderness is absent. No abdominal distension is present. Bowel sounds cannot be auscultated in the scrotum unless an associated hernia is present.

Unless an infection causes an acute hydrocele, no erythema or scrotal discoloration is observed.
Transillumination
A light source shined through the scrotum causes the hydrocele to illuminate. The bowel also may transilluminate; thus, positive transillumination findings are not diagnostic of hydrocele. Positive transillumination findings should not stop the clinician from investigating serious causes or co-morbid conditions that may be associated with secondary hydrocele. This procedure is not reliable for final diagnosis.

Transillumination testis usually positive.
A light source shines brightly through a hydrocele. Transillumination is common, and diagnostic for hydrocele. Transillumination may be observed with other etiologies of scrotal swelling (eg, hernia).

DIFFERENTIAL DIAGNOSIS
Indirect inguinal hernia
Epididymitis
Traumatic injury to the testicle

INVESTIGATIONS

BLOOD EXAMINATION
A CBC with differential count may indicate the existence of an inflammatory process. Urinalysis may detect proteinuria or pyuria.

ULTRASOUND SCAN
It is used to confirm the diagnosis. It may be useful to identify abnormalities in the testis, complex cystic masses, tumors, appendages, spermatocele, or associated hernia. In the context of pain or testicular bleeding after trauma, an imaging test can differentiate between a hydrocele and incarcerated bowel.

Hydrocele appears as a cystic mass within the spermatic cord (hydrocele of the cord) or as mass surrounding the testicle.

DOPPLER ULTRASOUND FLOW STUDY
This study is recommended to assess perfusion, even if an acute scrotum is clinically unlikely. This must be performed urgently if there is suspicion of testicular torsion or of traumatic hemorrhage into a hydrocele or testes. Sensitivity of Doppler ultrasound is 86-100%; specificity is up to 100%.

Limited availability of this test within a clinically useful period reduces its usefulness.

TESTICULAR SCINTIGRAPHY
This nuclear scan is particularly useful, especially in children, if testicular torsion is suspected. Decreased or absent flow to one testis or a testicular pole indicates torsion. Sensitivity for torsion can be 90%, but it is decreased with infancy, early torsion, incomplete torsion, and following detorsion. Specificity for torsion can be 90%, but it is decreased in the presence of scrotal fluid collections (such as hydrocele, hernia, abscess and hematocoele).

X-RAY ABDOMEN
Abdominal x-ray findings usually are normal in patients with hydrocele. If films demonstrate an obstructive gas pattern, they may help to differentiate between incarcerated hernia and hydrocele.

TREATMENT
MESENTERIC ISCHEMIA

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ASPIRATION

Aspiration of a hydrocele reveals a clear amber fluid. Aspiration is not therapeutic because the fluid generally reaccumulates quickly. Aspiration of hydroceles is not recommended because it is associated with a high rate of immediate recurrence and with a risk of introducing an infection. If an associated hernia is present, risk of perforating a loop of bowel also exists.

EMERGENCY CARE

Differentiating between a hydrocele and an acute scrotum (eg, testicular torsion, strangulated hernia) is important. As many as 50% of acute scrotum cases are initially misdiagnosed.

Transillumination is not diagnostic and cannot rule out an acute scrotum.

Ultrasound examination, imaging and Doppler evaluation of testicular blood flow is indicated when an acute scrotum is suspected.

ACUTE SCROTAL PROBLEMS

- Traumatic hemorrhage into a hydrocele or testes
- Testicular torsion with or without a secondary hydrocele.
- Ischemic testicle in children

SURGICAL TREATMENT

Hydrocele is treated through inguinal incisions with high ligation of the patent processus vaginalis (herniotomy) and excision of the distal sac.

- Hemiotomy
- Eversion of sac
- Lord’s operation

Spontaneous closure is unlikely in children older than 1 year. Infants with hydrocele are observed for 1-2 years. Surgical treatment is offered afterwards.

COMPLICATIONS

An extremely large hydrocele may impinge on the testicular blood supply. The resulting ischemia can cause testicular atrophy and subsequent impairment of fertility.

Hemorrhage into the hydrocele can result from testicular trauma.

Incarceration or strangulation of an associated hernia may occur.

SURGICAL COMPLICATIONS

Accidental injury to the vas deferens can occur during inguinal surgery for hydrocele.

Postoperative wound infections occur in 2% of patients undergoing surgery for hydrocele.

Postoperative hemorrhagic hydrocele is not uncommon, but it usually resolves spontaneously.

Direct injury to the spermatic vessels may occur.

PROGNOSIS

The prognosis for congenital hydrocele after surgery is excellent.

Most congenital cases resolve by the end of the first year of life.

Persistent congenital hydrocele is readily
corrected surgically. The prognosis of hydrocele presenting later in life depends upon the etiology of the hydrocele.

Adult-onset hydrocele is not uncommonly associated with an underlying malignancy.

**MISCELLANEOUS Medical/Legal Pitfalls**

In a patient with signs and symptoms of an acute scrotum, the presence of a hydrocele and a finding of positive transillumination does not rule out testicular torsion. Immediate definitive tests are indicated to rule out torsion because testicular survival is poor after 4 hours of ischemia. A reasonable search for possible etiologies should be documented.

**SPECIAL CONCERNS**

Pediatric: Most cases resolve without intervention.

Geriatric: Hydroceles in this group rarely resolve without surgical intervention.

**REFERENCES**


