HYDROCELE TESTIS

Testicular Hydrocele

An accumulation of clear fluid in the tunica vaginalis, the most internal of membranes containing a testicle.

♀ Diagnosis  ♂ Male

Related Diagnoses:
Undescended testes  Testicular cancer  Orchitis  Testicular torsion  Mumps  Epididymitis  Testicular atrophy

About Hydrocele testis

Hydrocele testis is an accumulation of clear fluid between the tunica vaginalis (Pic. 1) and testis (Pic. 2). Adult-onset primary non-communicating hydrocele testis causes progressive swelling and local discomfort on the affected side of the scrotum, and this has been attributed to the enhanced secretion and defective absorption of fluid in the space between the tunica vaginalis and testis. The cause is generally unknown. A secondary hydrocele testis is secondary to either inflammation or a neoplasm in the scrotum.

A hydrocele usually occurs on one side, but can also affect both sides. The accumulation can be a marker of physical trauma, infection, tumor or varicocele's surgery, but the cause is usually not clear.

Primary hydroceles

The swelling is soft and non-tender, large in size on examination and the testis cannot usually be felt. These hydroceles can reach a huge size, containing large amount of fluid, as these are painless and are often ignored. However, the long continued presence of large hydroceles causes atrophy of testis due to compression or by obstructing blood supply. In most cases, the hydrocele, when diagnosed early during complete physical examination, are small and the testis can easily be palpated within a lax hydrocele but an ultrasound imaging is necessary to visualize the testis if the hydrocele sac is dense, to reveal the primary abnormality. A common method of diagnosing a hydrocele is by attempting to shine a strong light (transillumination) through the enlarged scrotum. A hydrocele will usually pass light, while a tumor will not (except in the case of a malignancy with reactive hydrocele).

Secondary hydroceles

Secondary hydrocele due to testicular diseases, can be the result of, cancer, trauma (such as a hernia), or orchitis (inflammation of testis), and can also occur in infants undergoing peritoneal dialysis. A hydrocele is not a cancer but it should be excluded clinically if a presence of a testicular tumor is suspected. Secondary hydrocele is most frequently associated with acute or chronic epididymo-orchitis. It is also seen with torsion of the testis and with some testicular tumors. A secondary hydrocele is usually lax and of moderate size: the underlying testis is palpable. A secondary hydrocele subsides when the primary lesion resolves.

Infantile hydroceles

In infants and children, a hydrocele is usually an expression of a patent processus vaginalis (PPV). The tunica and the processus vaginalis are distended to the inguinal ring but there is no connection with the peritoneal
Congenital hydroceles

The processus vaginalis is patent and connects with the general peritoneal cavity. The communication is usually too small to allow herniation of intra-abdominal contents. Digital pressure on the hydrocele does not usually empty it, but the hydrocele fluid may drain into the peritoneal cavity when the child is lying down. Ascites or even ascitic tuberculous peritonitis should be considered if the swellings are bilateral.

Encysted hydrocele of the cord

There is a smooth oval swelling near the spermatic cord which is liable to be mistaken for an inguinal hernia. The swelling moves downwards and becomes less mobile if the testis is pulled gently downwards. Rarely, a hydrocele develops in a remnant of the processus vaginalis somewhere along the course of the spermatic cord. This hydrocele also transilluminates, and is known as an encysted hydrocele of the cord.

The accuracy of the diagnosis must be ascertained. **Great care must be taken to differentiate a hydrocele from a scrotal hernia or tumor of the testicle.** Ultrasound imaging can be very useful in these cases. A hernia usually can be reduced, transmits a cough impulse, and is not translucent. A hydrocele cannot be reduced into the inguinal canal and gives no impulse on coughing unless a hernia is also present. In young children a hydrocele is often associated with a complete congenital type of hernial sac.

Associated disease

- inguinal hernia
- testicular cancer
- atrophy of testes
- epididymo-orchitis
- cryptorchid testis
- hypospadias
- liver disease with ascites
- cystic fibrosis

Complications

- Herniation of the hydrocele sac through the dartos muscle sometimes occurs in long-standing cases.
- Transformation into a haematocele occurs if there is spontaneous bleeding into the sac or as a result of trauma. Acute haemorrhage into the tunica vaginalis sometimes results from testicular trauma and it may be difficult without exploration to decide whether the testis has been ruptured. If the haematocele is not drained, a clotted haematocele usually results.
- The sac may calcify. Clotted hydrocele may result from a slow spontaneous ooz of blood into the tunica vaginalis. It is usually painless and by the time the patient seeks help, it may be difficult to be sure that the swelling is not due to a testicular tumour. Indeed a tumour may present as a haematocele.
- The hydrocele fluid can be aspirated with a needle and syringe. Occasionally, severe infection can be introduced by aspiration. Simple aspiration, however, often may be used as a temporary measure in those cases where surgery is contraindicated or must be postponed.
- Posthernorrhaphy hydrocele is a relatively rare complication of inguinal hernia repair. It is possibly due to interruption to the lymphatics draining the scrotal contents.
- Infection which may lead to pyocele.
- Atrophy of testis in long standing cases.

Risk factors

- prematurely born babies
- scrotal injury
- infection
- torsion

Impact on fertility

Scientists believe that main impact of hydrocele on fertility is when hydrocele oppresses testes, which affects
blood circulation and then affects process of spermatogenesis. The testicular blood supply could be affected by an extremely large hydrocele. The result is testicular ischemia which could leads to testicular atrophy and subsequent impairment of fertility. Also when hydrocele is too large, it leads to enveloping of penile scrotal skin and it does not conducive to the normal sexual intercourse.

**Prevention**

Non-existing.

**Symptoms**

A hydrocele feels like a small fluid-filled balloon inside the scrotum. It is smooth, and is mainly in front of the testis. Hydroceles will vary greatly in size and are normally painless and harmless. However, as the fluid continues to accumulate and the scrotum further enlarges, more discomfort can be expected. Large hydroceles will cause discomfort because of their size. Sometimes pain can be in both testicles as pressure from the enlarged area puts pressure against the unaffected area which can cause discomfort to the normal testicle. It has also been found to decrease a man's sex drive and makes him less active for fear of enlarging the mass. As the fluid of a hydrocele is transparent, light shone through the hydroceleic region will be visible from the other side. This phenomenon is called transillumination.

Symptoms of a hydrocele can be easily distinguished from testicular cancer, as a hydrocele is soft and fluidiy, where a testicular cancer feels hard and rough.

Through diagnostic ultrasound the accumulation of fluids can be diagnosed correctly.

**Therapies**

**Self therapy**

For painless swelling in scrotum, Epsom salt bath can be very useful. After 20 minutes in very warm water with a few cups of Epsom salt blockage can be released, because heat stimulate body fluid trapped in scrotum sac to move. Epsom salt consist from magnesium and sulfate. Magnesium is necessary for relaxation of muscles which are part of scrotum, so it leads to reduction of swelling. If the swelling is painfull, hot water can worse your symptoms.

**Conventional medicine**

**Pharmacotherapy**

There is no pharmacotherapy which could heal hydrocele.

**Surgical therapy**

The fluid accumulation should generally be removed surgically. The procedure is called hydrocelectomy and can be performed on an outpatient basis during general or regional anesthesia. There are two surgical techniques available for hydrocelectomy:

**Hydrocelectomy with excision of the hydrocele sac**

Incision of the hydrocele sac after complete mobilization of the hydrocele. Partial resection of the hydrocele sac, leaving a margin of 1-2 cm. Care is taken not to injure testicular vessels, epididymis or ductus deferens. The edge of the hydrocele sac is oversewn for haemostasis (von Bergmann’s
Hydrocele surgery with plication of the hydrocele sac

The hydrocele is opened with a small skin incision without further preparation. The hydrocele sac is reduced (plicated) by suture. Hydrocele surgery: Lord’s technique. The plication technique is suitable for medium-sized and thin-walled hydroceles. The advantage of the plication technique is the minimized dissection with a reduced complication rate.

If the hydrocele is not surgically removed, it may continue to grow. The hydrocele fluid can be aspirated. This procedure is less invasive but, recurrence rates are high. Sclerotherapy, the injection of a solution following aspiration of the hydrocele fluid may increase success rates. In many patients, the procedure of aspiration and sclerotherapy is repeated as the hydrocele recurs.

Assisted reproduction

If conservative medical treatments fail to achieve a full term pregnancy, the physician may suggest the patient undergo in vitro fertilization (IVF). IVF and related techniques are called assisted reproductive technology (ART) techniques that generally start with stimulating the ovaries to increase egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman’s reproductive tract, in a procedure called embryo transfer.

Intracytoplasmic sperm injection (ICSI) is beneficial in the case of male factor infertility where sperm counts are very low or failed fertilization occurred with previous IVF attempt(s). The ICSI procedure involves a single sperm carefully injected into the center of an egg using a microneedle. With ICSI, only one sperm per egg is needed. Without ICSI, you need between 50,000 and 100,000.

Two techniques that enable to some extent the selection of physiologically normal spermatozoa have recently been developed. One of these is termed intracytoplasmic morphology-selected sperm injection (IMSI). Here, spermatozoa are selected for ICSI and analysed digitally prior to the microinjection procedure in order to deselect morphologically abnormal spermatozoa. With this technique, abnormalities not visible in standard ICSI procedures have been observed. IMSI increases the pregnancy rate during ICSI cycles, and some data suggests that the level of pregnancy termination is also decreased. A second technique recently introduced to assisted reproduction is that of sperm selection with hyaluronic acid (HA), e.g. PICSI. In this technique, mature sperm with HA receptors are distinguished from immature and abnormal sperm since these do not express such receptors.

Men who ejaculate no sperm, because of blocked tubes in their testes, or because of a genetic assumption that prevents their sperm being released, need some form of surgical sperm retrieval to enable ICSI to take place. Epididymal sperm obtained by microsurgical aspiration (MESA) or percutaneous sperm aspiration (PESA) and testicular sperm obtained by surgical excision (TESE) are used in ICSI treatment. Alternatively, the retrieved sperm can be cryopreserved for use in future sperm injection attempts. If all efforts to extract vital sperm cells fails, then donated ones may be recommended.

Infertile couples may also resort to egg donation or embryo donation when the female partner cannot have genetic children because her own eggs cannot generate a viable pregnancy. Surrogacy via a gestational carrier is also an option when a patient’s medical condition prevents a safe pregnancy, when a patient has ovaries but no uterus due to congenital absence or previous surgical removal, and where a patient has no ovaries and is also unable to carry a pregnancy to full term.
Diagnoses

Undescended testes
In the case of cryptorchidism one or both testes are absent from the scrotum. It is the most common etiologic factor of azoospermy in the adult.
Learn more at: www.fertilitypedia.org/therapy/diag/undescended-testes

Testicular cancer
Cancer that develops in the testicles.
Learn more at: www.fertilitypedia.org/therapy/diag/testicular-cancer

Orchitis
An inflammation of the testes, involving swelling and heavy pains.
Learn more at: www.fertilitypedia.org/therapy/diag/orchitis

Testicular torsion
Emergency medical condition occurring when the spermatic cord twists and cuts off the testicle's blood supply.
Learn more at: www.fertilitypedia.org/therapy/diag/testicular-torsion

Mumps
Mumps was a common childhood viral disease caused by the mumps virus. Mumps frequently causes orchitis and impairs male fertility.
Learn more at: www.fertilitypedia.org/therapy/diag/mumps

Epididymitis
An inflammation of epididymis.
Learn more at: www.fertilitypedia.org/therapy/diag/epididymitis

Testicular atrophy
A medical condition in which the testes diminish in size and may be accompanied by loss of function (production of sperm and testosterone).
Learn more at: www.fertilitypedia.org/therapy/diag/testicular-atrophy

Organs

Penis
External male sex organ that additionally serves as the urinal duct.
Learn more at: www.fertilitypedia.org/edu/organs/penis

Scrotum
Scrotum is an anatomical male reproductive structure that consists of a suspended sack of skin and smooth dual-chamber muscle located under the penis.
Learn more at: www.fertilitypedia.org/edu/organs/scrotum

Risk factors

Groin surgery
A surgery, which is performed in inguinal part of the body.
Learn more at: www.fertilitypedia.org/therapy/rf/groin-surgery

Inguinal hernia
A protrusion of abdominal-cavity contents through the inguinal canal.
Learn more at: www.fertilitypedia.org/therapy/rf/inguinal-hernia
Mumps
An infection that primarily affects the parotid glands, caused by the mumps virus which can impair male fertility.
Learn more at: www.fertilitypedia.org/therapy/ff/mumps

Preterm birth
Birth of the baby before 37 completed weeks of gestational age.
Learn more at: www.fertilitypedia.org/therapy/ff/preterm-birth

Sexually transmitted diseases
Illnesses that have a significant probability of transmission between humans by means of human sexual behavior and that may impact fertility.
Learn more at: www.fertilitypedia.org/therapy/ff/sexually-transmitted-diseases

Testicular or scrotal injury
Damage of the testicles or scrotum which may be temporary or permanent.
Learn more at: www.fertilitypedia.org/therapy/ff/testicular-or-scrotal-injury

Symptoms

Atrophy of the testicles
A not-temporary condition in which the testes diminish in size and may be accompanied by loss of function.
Learn more at: www.fertilitypedia.org/edu/symptoms/atrophy-of-the-testicles

Lowered libido
The absence of sexual appetite.
Learn more at: www.fertilitypedia.org/edu/symptoms/lowered-libido

Testicular pain
A discomfort felt in the testicles (testes) or scrotum.
Learn more at: www.fertilitypedia.org/edu/symptoms/testicular-pain

Testicular swelling
Excessive accumulation of any fluid in the area of testicles.
Learn more at: www.fertilitypedia.org/edu/symptoms/testicular-swelling

Therapies

Egg donation
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research.
Learn more at: www.fertilitypedia.org/edu/therapies/egg-donation

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.org/edu/therapies/icsi

IMSI
Method where live unstained spermatozoa are observed at 6000 or higher magnification to select sperm with the best morphology.
Learn more at: www.fertilitypedia.org/edu/therapies/imsi-1

MESA
A microsurgical procedure to harvest sperm from the single epididymal tubule (epididymis), used in the case of obstructive azoospermia.
Learn more at: www.fertilitypedia.org/edu/therapies/mesa
Micro TESE
Microsurgical method used to identify areas of sperm production within the testes with the aid of optical magnification.
Learn more at: www.fertilitypedia.org/edu/therapies/micro-tese

PESA
Sperm aspiration procedure in which a needle is inserted into the epididymis in order to retrieve sperm.
Learn more at: www.fertilitypedia.org/edu/therapies/pesa

PICSI
A sperm selection method prior ICSI based on hyaluronic acid binding.
Learn more at: www.fertilitypedia.org/edu/therapies/pcsi

Sperm donation
The procedure in which a man (sperm donor) provides his sperm for fertility treatment.
Learn more at: www.fertilitypedia.org/edu/therapies/sperm-donation

Sperm freezing
A procedure of assisted reproduction used to long term storage of sperm cells in liquid nitrogen for later use in assisted reproduction techniques.
Learn more at: www.fertilitypedia.org/edu/therapies/sperm-freezing

Standard IVF
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used.
Learn more at: www.fertilitypedia.org/edu/therapies/standard-ivf

TESE
Removal of a small portion of testicular tissue in order to extract a few viable sperm.
Learn more at: www.fertilitypedia.org/edu/therapies/tese

Gallery

Pic
Anatomical structures of testis, one of them- tunica vaginalis, where the fluid is collected.

Pic
Communicating hydrocele, caused by the failure of the processus vaginalis closure.

Sources

"Overexpression of Aquaporin 1 in the Tunica Vaginalis May Contribute to Adult-Onset Primary Hydrocele Testis" [http://www.hindawi.com/journals/au/2014/202434/] —by Hattori et al. licensed under CC BY 3.0

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