TESTICULAR ATROPHY

Shrunken Testicles

A medical condition in which the testes diminish in size and may be accompanied by loss of function (production of sperm and testosterone).

Diagnosis  Male

Related Diagnoses:
Varicocele  Erectile dysfunction  Hydrocele testis

About Testicular atrophy

Testicular atrophy is a medical condition in which the male reproductive organs (the testes, which in humans are located in the scrotum) diminish in size (Pic. 1) and may be accompanied by loss of function. The shrinkage of one or both testicles depends on the severity and duration of atrophy. This does not refer to temporary changes, such as those brought on by cold.

The testes are made up from two types of cells. The germ cells are the site of production of sperm and Leydig cells are site of production of male sex hormones so called androgens, primarily testosterone. Decreased levels of any or both of these cell types may lead to changes in testicular fluid levels, resulting in extremely shrunken testicles.

The most common cause of testicular atrophy is hormonal imbalance. When hormonal imbalances occur, the body produces less androgens causing them to shrink.

The diagnosis is based on the history of any possible external cause, such as steroid or medication use. Lifestyle and possible risk of sexually transmitted diseases (such as mumps and HIV infection) is also taken into account. Following physical exam is focused on palpation of the testicles and looking for any changes in size, texture, and firmness. In order to complete the diagnosis of testicular atrophy, the diagnosis may consist of the ultrasound exam of testicles is needed to assess blood flow and to identify any abnormalities and blood test to determine if the infection or hormone imbalance is presented.

The condition may be reversed with treatment of the disease but it depends on the severity of the atrophy.

Associated diseases

- hydrocele testis (the accumulation of fluids around a testicle)
- orchitis (an inflammation of testes)
- erectile dysfunction
- varicocele (an abnormal enlargement of the network of veins that leaves the testis)
- mumps
- HIV infection
- cryptorchidism (the absence of one or both testes from the scrotum)
- liver cirrhosis (the scarring of the liver caused by continuous long-term liver damage)
- hypothyroidism (thyroid function insufficiency)
- pituitary disorders
- hypothalamus disorders
- kidney diseases

Complications
In most cases, testicular atrophy is reversible (able to return) when caught early and given proper treatment. However, if left untreated for prolonged periods of time further damage may occur and decrease the chances of complete healing and fertility could be permanently affected.

**Risk factors**

- alcohol drinking
- advanced age
- radiation exposure
- chronic steroid use
- hormone replacement therapy
- zika virus
- systemic infections (e.g. chicken box and etc)

**Impact on fertility**

Testicles are formed from germ cells that transform into sperm cells and Leydig cells that produce testosterone. Whereby, the testicular atrophy affects those functions. As a result of the disturbed testicular structure, testicular atrophy may be accompanied with poor sperm morphology, and overall impaired spermatogenesis (sperm production), leading to the presence of oligospermia (low concentration of sperm) and teratospermia (the presence of sperm with abnormal morphology) and can cause a man to be sterile.

**Prevention**

Prevention of testicular atrophy also involves the adoption of a healthy lifestyle where alcohol consumption is occasional and drug use does not exist. Since childhood diseases, especially mumps, increase the risk of testicular atrophy, vaccination is necessary.

**Symptoms**

- pain in the testicles
- infertility
- sexual dysfunction
- decreased libido
- secondary sexual characteristic hypoplasia (breast growth (gynecomastia), puberty growth delays, even appears the male feminization)

**Therapies**

**Self therapy**

Not used.

**Conventional medicine**

The treatment is prescribed depending entirely on its origin. If the testicular atrophy has not changed further from the onset of pathology despite the treatment of the cause of the testicle, it can be treated hormonally or surgically.

**Pharmacotherapy**
Human chorionic gonadotropin (hCG)

Hormonal therapy is used to induce the descent of the testicles and/or to locate impalpable testicles. The use of hCG stimulates the Leydig cells of testicles to produce testosterone. The gonadotropin-releasing hormone (GnRH) stimulates the pituitary gland to secrete luteinizing hormone (LH) which, in its turn, stimulates the Leydig cells to produce testosterone and start the descent of the testicles. Currently, hormonal therapy is also used to stimulate the proliferation and maturation of germ cells, contributing to improve fertility.

Surgical therapy

Surgical intervention could be necessary in the case of testicular torsion that occurs when the spermatic cord twists, cutting off the testicle’s blood supply to prevent testicular atrophy.

Assisted reproduction

If infertility persists after the treatment, assisted reproductive technologies (ART) give an option. Assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such as fertility medication, artificial insemination, in vitro fertilization and surrogacy. It is reproductive technology used primarily for infertility treatments, and is also known as fertility treatment. It mainly belongs to the field of reproductive endocrinology and infertility, and may also include intracytoplasmic sperm injection (ICSI) and cryopreservation (preservation of cells and tissue by freezing).

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 condition that prevents their sperm being released, require 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) or percutaneous aspiration (TESA) 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 sperm donation.

Find more about related issues

Diagnoses

Varicocele
An abnormal enlargement of the pampiniform venous plexus in the scrotum.
Learn more at: www.fertilitypedia.org/therapy/diag/varicocele
Erectile dysfunction
The inability (that lasts more than 6 months) to develop or maintain an erection of the penis during sexual activity.
Learn more at: www.fertilitypedia.org/therapy/diag/erectile-dysfunction

Hydrocele testis
An accumulation of clear fluid in the tunica vaginalis, the most internal of membranes containing a testicle.
Learn more at: www.fertilitypedia.org/therapy/diag/hydrocele-testis

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

**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

**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

Gallery

**Pic**
Testicular atrophy at left (TE) resulting from chronic orchitis. Impaired vascular supply of the left testis has generated a significant volumetric decrease and diffuse hypoechoogenicity.

Sources

"Testes" [https://courses.lumenlearning.com/boundless-ap/chapter/the-male-reproductive-system/] — sourced from Lumen licensed under CC BY 4.0

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