CONDITION

Varicocele

A varicocele is a group of enlarged veins in the scrotum, usually above the left testicle.

WHAT IT IS
Enlarged veins around a testicle

BODY SYSTEM
Male reproductive and circulatory systems

MAIN SYMPTOMS
Dull ache, heaviness, swelling, testicle size difference

WHAT CAUSES IT
Vein valves and anatomy allow blood to pool

HOW IT IS DIAGNOSED
Standing examination, sometimes Doppler ultrasound

MAIN TREATMENT
Monitoring, symptom relief, or vein repair

CAN IT BE CURED?
Sometimes - repair closes veins, but recurrence is possible

IS IT AN EMERGENCY?
Sometimes - sudden severe testicle pain needs emergency assessment

LONG-TERM OUTLOOK
Usually stable, but fertility or testicle growth may be affected

Overview

A varicocele is a group of enlarged veins inside the scrotum, the skin pouch that holds the testicles. It is similar to a varicose vein in the leg. The affected veins are part of a network called the pampiniform plexus, which normally carries blood away from a testicle.

Varicoceles occur more often on the left side because of the way the veins connect in the abdomen. They can affect both sides, while an isolated right-sided varicocele is less common.

Many varicoceles cause no symptoms and need no treatment. Others may produce aching, swelling, or a difference in testicle size. Some are linked with reduced sperm production and difficulty getting a partner pregnant.

A varicocele is not cancer and does not spread to other parts of the body. However, a new scrotal lump or swelling still needs assessment because several conditions can feel similar.

Symptoms

A varicocele may be found during a routine examination or fertility assessment before you notice anything unusual.

When symptoms occur, they may include:

The discomfort is usually mild or aching rather than sudden and severe. Scrotal pain can have many causes, so its pattern alone cannot confirm a varicocele.

In adolescents, a varicocele may affect the growth of one testicle. In adults, it may be discovered during tests for infertility. Having a varicocele does not automatically mean that you are infertile, and many people with one can conceive without treatment.

- A dull ache or dragging feeling in the scrotum
- Heaviness or swelling, often worse on the affected side
- Enlarged, twisted veins that may feel like a "bag of worms"
- One testicle appearing smaller than the other
- Discomfort that increases after standing, exercise, or a long day
- Pain that improves when you lie down

Causes and risk factors

Blood normally travels from the testicles through veins toward the heart. Small valves inside these veins help keep blood moving in the correct direction. If blood flows backward or drains poorly, pressure can build and enlarge the veins.

Anatomy also plays a role. The left testicular vein follows a longer route and joins a larger vein at an angle that can make drainage less efficient. This helps explain why most varicoceles are left-sided.

Varicoceles often develop during puberty, when blood flow to the testicles increases. They are not caused by sexual activity, masturbation, sexually transmitted infections, or something you did.

Rarely, pressure on a vein in the abdomen can interfere with blood drainage. A clinician may consider this possibility if a varicocele develops suddenly, occurs only on the right, remains enlarged while you are lying down, or appears later in life. These findings do not necessarily mean there is a serious cause, but they deserve assessment.

Diagnosis

Diagnosis usually begins with a medical history and physical examination. You may be examined while standing because the veins can be easier to feel in that position. You might be asked to take a breath and gently bear down, known as the Valsalva manoeuvre. This temporarily increases pressure in the abdominal veins.

A physical examination can also help check for other causes of swelling, including a fluid collection, groin hernia, cyst, or testicular lump.

A Doppler ultrasound may be used if the examination is unclear, if the scrotum is difficult to examine, or if there are unusual features. This painless scan uses sound waves to show the veins and the direction of blood flow. It can also measure testicle size and look for another cause of symptoms.

If fertility is a concern, semen analysis may be offered. This checks features such as sperm number, movement, and shape. Because results naturally change between samples, more than one test may be needed.

Blood tests for hormones are sometimes considered when there are signs of low testosterone or impaired testicular function. Not everyone with a varicocele needs fertility tests, hormone tests, or imaging.

Treatment and management

A varicocele that causes no important symptoms and is not affecting testicle growth or fertility may only need observation. Follow-up may include checking symptoms and testicle size. Adolescents may have periodic measurements to make sure both testicles continue to develop.

For mild discomfort, supportive underwear may reduce pulling on the scrotum. Limiting an activity that clearly triggers pain can also help. A non-prescription pain reliever may be reasonable for some people, but it should only be used according to its label and may not be suitable if you have certain medical conditions or take other medicines.

Repair may be considered when there is persistent pain despite simple measures, reduced growth of the affected testicle, or a fertility concern linked to a varicocele. For fertility treatment, the examination and semen results matter. Repair of a varicocele seen only on imaging, but not felt during an examination, is not routinely used to improve fertility.

The main repair options are:

These treatments differ in anaesthesia, recovery, availability, and risks. After a procedure,

temporary soreness and swelling are common. Instructions about work, exercise, wound care, and sexual activity depend on the procedure.

Repair may improve pain, semen measurements, or testicle growth, but improvement is not guaranteed. Changes in semen quality take time because sperm production occurs over several months.

- Varicocelectomy: An operation that closes or ties off the enlarged veins so blood uses healthier routes. A microsurgical approach uses magnification to help protect the testicular artery and lymph vessels.
- Laparoscopic repair: Keyhole surgery performed through small cuts in the abdomen. It is used in selected situations.
- Embolization: A radiologist passes a thin tube through a vein and uses coils or another blocking material to close the abnormal veins from inside.

Complications

Most varicoceles do not lead to serious health problems. Possible effects include reduced growth or shrinkage of the affected testicle. This may relate to altered blood flow and a slightly warmer environment around the testicle.

A varicocele can interfere with sperm production in some people. It may affect sperm number, movement, or quality and can contribute to infertility. Other fertility factors may be present at the same time, including factors affecting a partner.

Some people with varicoceles have lower testosterone levels, but the relationship is not simple. A varicocele does not mean you will develop testosterone deficiency, sexual problems, or infertility.

Possible complications of treatment include bleeding, infection, fluid around the testicle called a hydrocele, ongoing pain, or recurrence of the enlarged veins. Injury to the artery supplying the testicle is uncommon but potentially serious. Embolization can also fail to reach or fully close the vein, and the blocking material can rarely move from its intended position.

Prevention

There is no proven way to prevent a varicocele. It usually results from vein anatomy and the way blood drains from the testicles, rather than from lifestyle choices.

Exercise, lifting, sex, and masturbation do not cause a varicocele. These activities may make an

existing varicocele more noticeable or uncomfortable because pressure and blood flow temporarily increase.

Supportive underwear and adjusting activities may reduce symptoms, but they do not prevent or remove the enlarged veins.

Living with it and what to expect

Many varicoceles remain stable for years and never need treatment. Symptoms may come and go. Aching is often more noticeable after standing or physical activity and may settle with rest or lying down.

If observation is recommended, attend routine follow-up as planned. Follow-up is particularly useful during adolescence, when testicle growth can be compared over time. Adults who hope to have children may need reassessment if conception is taking longer than expected.

A visible varicocele can affect confidence or cause worry about sex and fertility. It is not contagious and cannot be passed to a partner. It does not usually prevent sex, exercise, or everyday activities unless discomfort gets in the way.

After repair, swelling and discomfort generally improve gradually rather than immediately. The veins may still look or feel enlarged for a while, even when blood flow through them has been successfully blocked. Pain may persist in some people, especially if it had another cause.

Fertility treatment does not always end with varicocele repair. Semen tests may be repeated after enough time has passed for new sperm to develop. Some couples may still need other fertility care.

When to get medical help

Arrange a routine medical appointment if you notice a new lump, swelling, enlarged veins, ongoing ache, or a change in testicle size. An examination can confirm whether the finding is a varicocele and rule out other causes.

Seek routine follow-up if symptoms are becoming more frequent, pain is interfering with daily life, or you have concerns about puberty, testosterone symptoms, or fertility. A varicocele that appears suddenly, is only on the right, or stays full when you lie down should also be assessed promptly.

Get emergency medical help for sudden, severe testicle pain, especially with swelling, nausea, vomiting, or a testicle sitting higher than usual. These symptoms may be caused by testicular

torsion, in which the testicle twists and loses its blood supply. Torsion requires urgent treatment and should not be assumed to be varicocele pain.

Urgent assessment is also appropriate after a scrotal injury with severe pain or swelling, or if pain is accompanied by fever, redness, and feeling unwell.

Common questions

Can a varicocele go away on its own?

It usually does not disappear without treatment. Its size and symptoms may change during the day, and it may feel smaller when you lie down. A varicocele that causes no problems can often be left in place safely.

Does a varicocele mean I am infertile?

No. Many people with a varicocele have normal fertility. It can affect sperm production in some people, but fertility also depends on other health and reproductive factors. Semen analysis is needed to assess sperm rather than assuming there is a problem.

Can I exercise with a varicocele?

Most people can exercise. If a particular activity causes aching, supportive underwear, rest, or changing the activity may help. Sudden or severe pain during exercise needs medical assessment rather than being treated as a normal varicocele symptom.

Will surgery or embolization improve fertility?

Repair can improve semen measurements and the chance of pregnancy in selected people, particularly when there is a varicocele that can be felt and an abnormal semen analysis. It does not guarantee pregnancy, and benefits may take several months to become apparent.

Does a varicocele cause erectile dysfunction?

A varicocele does not usually cause erectile dysfunction directly. It has been associated with lower testosterone in some people, but many have normal hormone levels and sexual function. New erectile problems should be assessed on their own merits.

Can a varicocele come back after treatment?

Yes. Enlarged veins can persist or return if not all abnormal drainage routes were closed or if new routes develop. Recurrence does not always require another procedure; management is based on symptoms, examination findings, testicle health, and fertility goals.

Sources

- American Urological Association and American Society for Reproductive Medicine. Diagnosis and Treatment of Infertility in Men: AUA/ASRM Guideline.
- European Association of Urology. EAU Guidelines on Sexual and Reproductive Health: Male Infertility.
- Mayo Clinic. Varicocele: Symptoms and causes; diagnosis and treatment.
- Johns Hopkins Medicine. Varicocele.
- Urology Care Foundation. Varicoceles.
- RadiologyInfo.org, American College of Radiology and Radiological Society of North America. Varicocele Embolization.