PROCEDURE

Testicular biopsy

A testicular biopsy removes a small tissue sample to examine sperm production or collect sperm for fertility treatment.

PURPOSE
Examine testicular tissue or retrieve sperm for fertility treatment

PROCEDURE TYPE
Diagnostic or both - minimally invasive needle or surgical sampling

WHERE IT IS DONE
Outpatient clinic or operating theatre

ANAESTHESIA
Local, moderate sedation, or general, based on technique

HOW LONG IT TAKES
About 15-30 minutes; sperm retrieval may take longer

PREPARATION
Medication review; fasting if sedation or general anaesthesia

RECOVERY
Same day; no driving after sedation or general anaesthesia

MAIN RISKS
Pain, bleeding, infection, testicular injury

RESULTS
Sperm findings same day; pathology usually takes several days

Overview

A testicular biopsy removes a small sample of tissue from one or both testicles. The sample may be examined under a microscope to assess sperm production. It may also be searched for usable sperm, which can be frozen or used in fertility treatment.

The sample can be taken through a needle placed through the scrotal skin or through a small surgical cut. An open procedure used to collect sperm is often called testicular sperm extraction, or TESE. Microdissection TESE, or micro-TESE, is a longer operation that uses a surgical microscope to look for areas more likely to contain sperm.

A biopsy is no longer routinely needed for every person with a low or absent sperm count. Semen tests, hormone tests, genetic testing and an examination often provide enough information. The exact purpose of the proposed biopsy should therefore be clear before you

consent.

Why the procedure is performed

A testicular biopsy is mainly used when no sperm are found in semen, a condition called azoospermia. It can help assess whether the testicles are producing sperm or whether sperm may be blocked from reaching the semen.

However, professional guidance advises against routinely using biopsy only to tell these two situations apart. Other test results often provide the answer without surgery.

A biopsy or sperm extraction may be offered to:

A biopsy through the scrotum is generally not used to diagnose a testicular mass that may be cancer. This could interfere with normal lymph drainage and later treatment planning.

- Look for sperm that could be used with in vitro fertilisation and intracytoplasmic sperm injection, known as IVF with ICSI
- Examine sperm production when other tests have not provided enough information
- Collect and freeze sperm during surgery to investigate or repair a blockage
- Check for abnormal pre-cancerous cells in selected people at increased risk

Who should and should not have it

You may be offered a biopsy if semen tests repeatedly show no sperm and the result will affect fertility treatment. It may also be considered when sperm need to be collected directly from the testicle.

Before recommending it, the fertility team may review your medical history, examine the testicles and arrange hormone or genetic tests. Certain genetic findings can show that sperm retrieval is extremely unlikely, making surgery less useful.

The procedure may be avoided or delayed when:

A biopsy cannot guarantee that sperm will be found or that fertility treatment will lead to pregnancy. Ask how the result would change your options before deciding.

- Semen, hormone and genetic tests can answer the clinical question without tissue sampling

- A suspicious testicular mass requires assessment through the groin rather than a scrotal biopsy
- There is an active infection of the scrotal skin or nearby tissues
- A bleeding disorder is not controlled or blood-thinning medicine has not been managed safely
- An illness makes the planned anaesthesia unsafe at that time

How to prepare

Follow the treating facility's own instructions, which take priority over general advice here. Preparation differs according to whether you will have local anaesthetic, sedation or general anaesthesia.

Tell the team about all medicines, vitamins and supplements you take. This is especially important for anticoagulants and antiplatelet medicines, which reduce blood clotting. Do not stop prescribed medicine unless the treating team tells you exactly how and when.

You may need to:

Ask whether you should trim any hair. Do not shave the area unless instructed, because small skin cuts can increase the chance of infection.

- Avoid food and drink for a set time if sedation or general anaesthesia is planned
- Arrange for an adult to take you home and stay with you afterward
- Bring supportive underwear to reduce movement and discomfort
- Discuss whether retrieved sperm should be frozen
- Complete recommended hormone or genetic testing before sperm retrieval

What happens during the procedure

The team will confirm your identity, the reason for the biopsy and which testicle will be sampled. The scrotal skin is cleaned. You may receive local anaesthetic to numb the area, sometimes with sedation, or a general anaesthetic that makes you unconscious.

For a needle biopsy, a hollow needle passes through the scrotal skin into the testicle. One or more small tissue samples are removed.

For an open biopsy or TESE, the surgeon makes a small cut in the scrotum and testicle covering. A tiny piece of tissue or several samples are removed. Dissolving stitches are usually

used to close the openings.

If sperm retrieval is the goal, laboratory staff may examine the tissue during the procedure. Suitable sperm may be used fresh or frozen. Micro-TESE involves a larger surgical exposure and microscope-assisted examination of the tissue, so it usually takes longer than a simple biopsy.

Recovery and what to expect afterward

Pain is usually mild to moderate. Tenderness, bruising and limited swelling can last for several days. Use pain relief only as directed. A wrapped cold pack and supportive underwear may help; avoid putting ice directly on the skin.

You can usually eat and drink normally once you are awake, unless the team gives you different instructions. Nausea can occur after sedation or general anaesthesia, so starting with light food may be more comfortable.

Rest on the day of the procedure. Avoid heavy lifting, strenuous exercise and sexual activity for the period specified by your surgeon, often several days or longer after a more extensive extraction. Follow the wound-care instructions and avoid soaking the incision until permitted.

Do not drive yourself home after sedation or general anaesthesia. Wait until the facility's stated restriction has passed and you can make an emergency stop comfortably without sedating pain medicine.

Many people return to desk-based work within a few days. More time may be needed after micro-TESE or if your work involves lifting, climbing or prolonged physical activity.

Risks and possible complications

Expected short-term effects include soreness, bruising and a small amount of spotting from the wound. Possible complications include:

Further treatment may be needed for significant bleeding or infection. Extensive testicular damage or shrinkage is possible but is not an expected outcome of a small, uncomplicated biopsy.

- Bleeding into the scrotum, forming a collection called a haematoma
- Wound or testicular infection
- Persistent pain or swelling

- Scarring or damage to testicular tissue
- Reduced testosterone production, particularly after extensive or repeated sampling
- Failure to find usable sperm
- Reactions related to sedation or general anaesthesia

Results and follow up

If the procedure is being used to find sperm, the laboratory may provide an initial result on the same day. You should be told whether sperm were found, whether they were frozen and what this means for fertility treatment.

A tissue examination by a pathologist usually takes several days, although timing differs between laboratories. The report may describe normal sperm production, reduced production, absence of developing sperm or sperm development that stops at an early stage. It may also identify abnormal cells if that was the reason for testing.

A routine follow-up appointment is used to check healing and explain the results. Your team may discuss fertility treatment, reconstructive surgery for a blockage, hormone assessment or other options. A result showing no sperm in one sample does not always prove that none are present elsewhere, but further surgery may still have limited benefit.

Alternatives

The alternatives depend on why the biopsy has been offered.

Repeat semen analyses, hormone testing, genetic testing, examination and ultrasound avoid surgery. They are easier and carry no biopsy-related wound risks, but they cannot retrieve sperm and may not fully show what is happening inside the testicle.

If a known blockage prevents sperm entering the semen, microsurgical repair may restore sperm to the ejaculate. It is more extensive surgery and does not always work, but successful repair may allow conception without surgical sperm retrieval.

Sperm can sometimes be collected from the epididymis, the coiled tube beside the testicle, using aspiration or microsurgery. This avoids removing testicular tissue but is useful mainly when sperm production is normal and there is a blockage. Retrieved sperm generally need IVF with ICSI.

Donor sperm, adoption or choosing not to pursue treatment avoid testicular surgery. They also mean that pregnancy would not use your own sperm.

For a suspicious testicular mass, the usual alternative is specialist surgical assessment through the groin, often with removal of the affected testicle. Selected small or uncertain abnormalities may be managed with repeat imaging or specialist testicle-sparing surgery, rather than a routine scrotal biopsy.

When to call your healthcare team

Contact the treating team promptly for increasing redness, warmth or swelling; pus or unpleasant-smelling drainage; fever; a wound that opens; or pain that is worsening rather than improving. These need assessment but are not always emergencies.

Seek urgent or emergency care for:

Mild bruising, tenderness and a small amount of wound spotting are usually discussed at routine follow-up unless they worsen or concern you.

- Rapidly enlarging or tense scrotal swelling
- Bleeding that does not stop with gentle pressure
- Severe or sudden testicular pain
- Fainting, marked weakness or difficulty breathing
- A serious reaction after anaesthesia

Common questions

Will I be asleep?

Not always. A needle or small open biopsy can often be done with local anaesthetic while you are awake. Sedation or general anaesthesia may be used for open sperm retrieval, micro-TESE or according to the facility's practice.

How painful is a testicular biopsy?

The anaesthetic should prevent sharp pain during the procedure, although you may feel pressure or pulling. Soreness and bruising afterward are common and usually manageable with the recommended pain relief and scrotal support.

Can I drive home?

Not after sedation or general anaesthesia. Arrange a ride home. Even with local anaesthetic alone, ask the facility whether driving is permitted and consider whether discomfort could affect safe braking.

When will I know the result?

An initial sperm-retrieval result may be available the same day. A full pathology report usually takes several days. Your team should explain when and how you will receive it.

Can the biopsy affect fertility or testosterone?

A small biopsy removes little tissue, but bleeding, scarring or testicular injury can affect function. More extensive or repeated procedures may carry a greater risk of reduced testosterone production. The procedure may retrieve sperm, but it cannot guarantee future fertility.

Will the stitches need removing?

Most open biopsies use dissolving stitches. Ask before leaving because wound closure methods and care instructions differ.

Sources

- American Urological Association and American Society for Reproductive Medicine. Diagnosis and Treatment of Infertility in Men: AUA/ASRM Guideline . Published 2020; amended 2024.
- European Association of Urology. EAU Guidelines on Sexual and Reproductive Health: Male Infertility . 2024 edition.
- European Association of Urology. EAU Guidelines on Testicular Cancer: Diagnostic Evaluation . 2024 edition.
- U.S. National Library of Medicine. MedlinePlus Medical Encyclopedia: Testicular Biopsy .
- Cleveland Clinic. Testicular Biopsy: Purpose, Procedure, Risks & Recovery .