MICRO TESE

Microdissection Tese, Microsurgical Testicular Sperm Extraction

Microsurgical method used to identify areas of sperm production within the testes with the aid of optical magnification.

About Micro TESE

The concept of micro-TESE is to identify areas of sperm production within the testes with the aid of optical magnification (15-25x) and based on the size and appearance of the seminiferous tubules. Micro-TESE is recommended for the most severe cases of non-obstructive azoospermia (NOA).

MicroTESE yields the highest sperm retrieval rate and causes the least amount of damage to the testis.

Miniinvasive alternative to TESE using microdissection microscope. In microsurgical testicular sperm extraction (microdissection TESE; micro-TESE), the testicular parenchyma is dissected under magnification to search for enlarged seminiferous tubules, which are more likely to contain germ cells and foci of sperm production compared to non-enlarged or collapsed tubules. Such seminiferous tubules are removed rather than proceeding with the large single or multiple biopsies performed in conventional TESE.

For micro-TESE, the scrotal skin is stretched over the anterior surface of the testis, after which a 2.3 cm transverse incision is made. Alternatively, a single midline scrotal incision can be used. The incision extends through the dartos muscle and the tunica vaginalis. The tunica is opened, and identifiable bleeder are cauterized. The testis is delivered extravaginally, and the tunica albuginea is examined. Then, a single, large, mid-portion incision is made in an avascular area of the tunica albuginea under 6-8x magnification, and the testicular parenchyma is widely exposed in its equatorial plane (Pic. 1). The testicular parenchyma is dissected at 16-25x magnification to enable the search and isolation of seminiferous tubules that exhibit larger diameters (which are more likely to contain germ cells and eventually normal sperm production) in comparison to non-enlarged or collapsed counterparts (Pic. 2). If needed, the superficial and deep testicular regions can be examined, and microsurgical-guided testicular biopsies are performed by carefully removing enlarged tubules using microsurgical forceps. If enlarged tubules are not observed, any tubule that differs from the remaining tubules in size is excised. The excised testicular tissue specimens are placed into the inner well of a Petri dish containing sperm media, and are sent to the laboratory for processing and sperm search (Pic. 3). The tunicas albuginea and vaginalis are then closed in a running fashion using non-absorbable and absorbable sutures. The dartos muscle is closed with interrupted absorbable sutures, respectively. Immediately prior to complete closure, 3 cc of 1% xylocaine solution may be injected into the subcuticular layers. The skin is closed using a continuous subcuticular 4-0 vicryl suture. A fluffy-type scrotal dressing and scrotal supporter are placed.

Success or failure factors

Moreover, microsurgical techniques can compensate for negative aspects such as testosterone deficiency, which requires lifelong androgen replacement in conjunction with the multiple sampling.

There is no individual characteristic or variable that can accurately predict the ability to retrieve sperm during a surgical procedure. While preoperative variables still do not provide a perfect model to predict success of micro-TESE, current research suggests that a combination of these variables can be used to counsel patients and help guide clinical decisions.
Prognostic factors have included testis size, follicle stimulating hormone (FSH), inhibin beta, the etiology of infertility (Klinefelter syndrome, varicocele, cryptorchidism, …) and genetic alterations; however, the histological testicular pattern remains the best predictor of sperm retrieval, although with the inconvenience of a second invasive procedure.

**Complications**

No serious adverse effects have been published following microsurgical TESE, qualifying this procedure as safe. Theoretically one should expect fewer complications compared to a classic testicular biopsy since better visualization should lead to better safekeeping of the testicular end-arteries.

Microsurgical TESE can be a reason of testosterone deficiency but other factors, which can gradually compromise the Leydig cell function (e.g. cryptorchidism, testicular torsion, chemotherapy) should always be taken in consideration when the testosterone level declines. Further studies are needed to find the major contributing factor of long-term androgen deficiency after microsurgical TESE.

**Prognosis**

The reported micro-TESE retrieval rates range from 35-77%. Moreover, controlled studies demonstrated that micro-TESE performs better than conventional TESE or TESA. Micro-TESE has been shown to minimize the damage to testicular tissue and maximize sperm recovery because the seminiferous tubules containing active foci of spermatogenesis can be better identified. Micro-TESE was shown to be particularly more effective than conventional TESE in recovering sperm from men with a testicular volume of less than 10 ml. (42% vs. 27%).

**Find more about related issues**

- **Anejaculation**
  The pathological inability to ejaculate in males, with (orgasmic) or without (anorgasmic) orgasm.
  Learn more at: [www.fertilitypedia.org/therapy/diag/anejaculation](http://www.fertilitypedia.org/therapy/diag/anejaculation)

- **Aspermia**
  Male diagnosis connected with male infertility characterised by the complete absence of semen.
  Learn more at: [www.fertilitypedia.org/therapy/diag/aspermia](http://www.fertilitypedia.org/therapy/diag/aspermia)

- **Azoospermia**
  Complete absence of sperm in the ejaculate of a man.
  Learn more at: [www.fertilitypedia.org/therapy/diag/azoospermia](http://www.fertilitypedia.org/therapy/diag/azoospermia)

- **Cryptozoospermia**
  Male infertility diagnosis characterized by extremely low concentration of sperm in semen.
  Learn more at: [www.fertilitypedia.org/therapy/diag/cryptozoospermia](http://www.fertilitypedia.org/therapy/diag/cryptozoospermia)

- **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](http://www.fertilitypedia.org/therapy/diag/hydrocele-testis)

- **Hypogonadism**
  A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
  Learn more at: [www.fertilitypedia.org/therapy/diag/hypogonadism](http://www.fertilitypedia.org/therapy/diag/hypogonadism)
Kallmann syndrome
A genetic condition where the primary symptom is a failure to start puberty or a failure to fully complete puberty.
Learn more at: www.fertilitypedia.org/therapy/diag/kallmann-syndrome

Klinefelter syndrome
The set of symptoms that result from two or more X chromosome in males.
Learn more at: www.fertilitypedia.org/therapy/diag/klinefelter-syndrome

Non-obstructive azoospermia
Complete absence of sperm in the ejaculate due to testicular failure.
Learn more at: www.fertilitypedia.org/therapy/diag/non-obstructive-azoospermia

Obstructive azoospermia
Absence of sperm in the ejaculate despite normal spermatogenesis, caused by an obstruction of the genital tract.
Learn more at: www.fertilitypedia.org/therapy/diag/obstructive-azoospermia

XX male syndrome
The male sex chromosomal disorder characterized by a spectrum of clinical presentations, ranging from ambiguous to normal male genitalia.
Learn more at: www.fertilitypedia.org/therapy/diag/xx-male-syndrome

Y-chromosome deletions
A family of genetic disorders caused by missing gene(s) in the Y chromosome.
Learn more at: www.fertilitypedia.org/therapy/diag/y-chromosome-deletions

⚠️ Risk factors

Vasectomy
A surgical procedure for male sterilization or permanent contraception.
Learn more at: www.fertilitypedia.org/therapy/rf/vasectomy

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/rf/mumps

Gallery

Microsurgical techniques and instruments (A), including an operating microscope (B), are used throughout the procedure. After testis exteriorization, a single large incision is made in an avascular area of the albuginea (C), and the testicular parenchyma.

The seminiferous tubules with enlarged diameters (black arrow) are likely to contain active spermatogenesis, while the thin tubules usually contain Sertoli cells only (white arrow).
Sources

"An update on sperm retrieval techniques for azoospermic males"—by Esteves et al. licensed under CC BY-NC 4.0

"Microdissection Testicular Sperm Extraction (micro-TESE) as a Sperm Acquisition Method for Men with Nonobstructive Azoospermia Seeking Fertility: Operative and Laboratory Aspects"—by Esteves licensed under CC BY-NC 3.0

"Long term effects of micro-surgical testicular sperm extraction on androgen status in patients with non obstructive azoospermia"—by Everaert et al. licensed under CC BY 2.0

"Cryopreservation of testicular and epididymal sperm: techniques and clinical outcomes of assisted conception"—by Gangrade licensed under CC BY-NC 4.0

"Prognostic factors for sperm retrieval in non-obstructive azoospermia"—by Glima and Vieira licensed under CC BY-NC 4.0

"Predictive factors of successful microdissection testicular sperm extraction"—by Bernie et al. licensed under CC BY 2.0

"Microdissection TESE (MD-TESE) Does not Improve Sperm Retrieval Rate but Contributes to Favorable Pregnancy Rate in Non-Obstructive Azoospermic (NOA) Patients"—by Hibi et al. licensed under CC BY-NC 4.0