SURGICAL TREATMENT OF MALE INFERTILITY

Training Course in
Sexual and Reproductive Health Research

Geneva Foundation for Medical Education and Research

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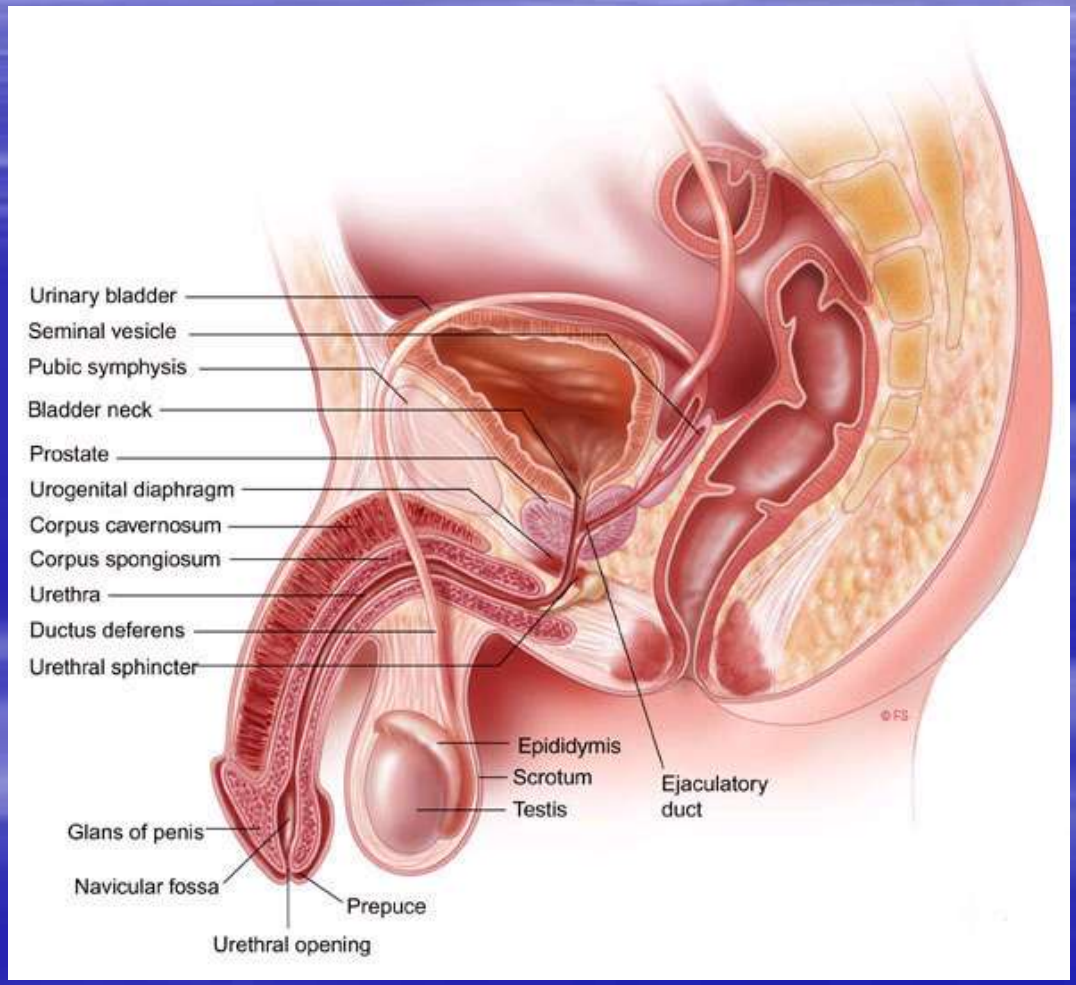
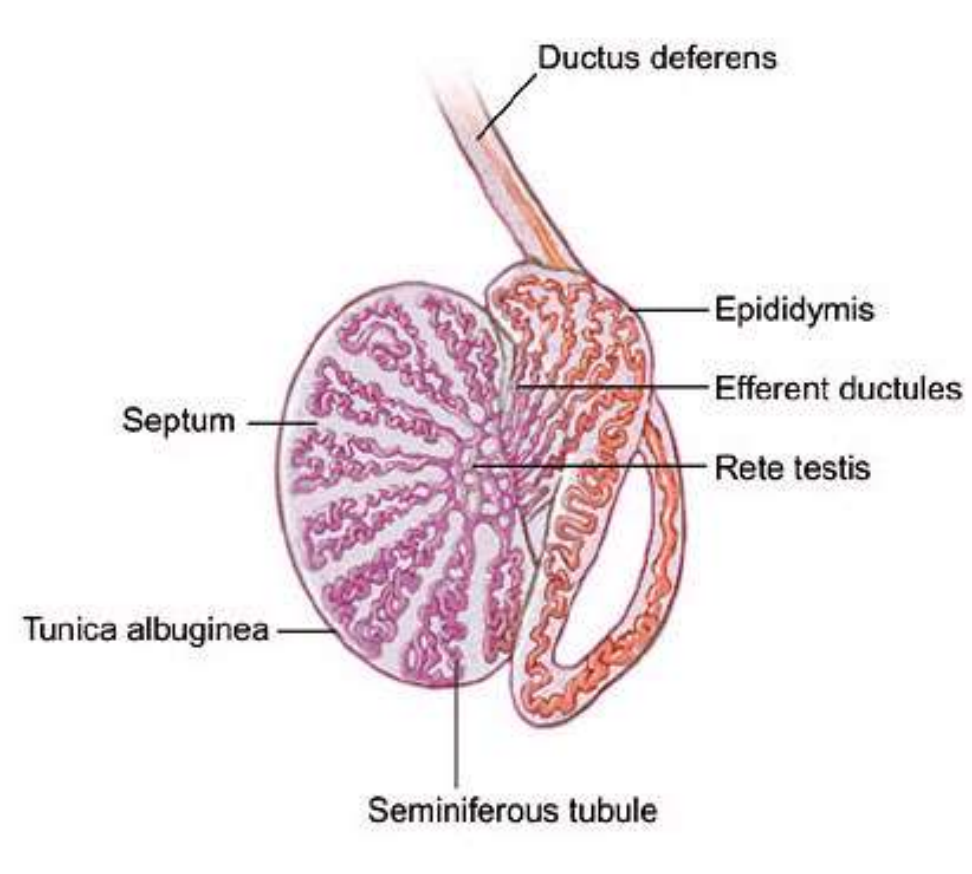
Anatomy



UrologyHealth.org Anatomical Drawings

Anatomy



UrologyHealth.org Anatomical Drawings

Causes of male infertility (1)

- Testicular insufficiency
  - Cryptorchidism
  - Orchitis, torsion
  - Chemo and radiotherapy
  - Genetic (Klinefelter syndrome, Y deletion)
- Endocrine disorders
  - Kallmann syndrome, Leydig tumour, pituitary disorders

Causes of male infertility (2)

- Obstruction of the genital tract
  - Absence of the vas deferens (congenital, CF)
  - Prostatic cyst
  - Epididymal or vasal obstruction (inf. or surg.)
- Varicocele
- Miscellaneous
  - Sexual problem, « idiopathic »

Only a few causes of male infertility can be surgically treated

- *Varicocele*
- *Obstructive causes 7% to 14% of azoospermia*

Obstruction

- Congenital
  - agenesis
    - cystic fibrosis
  - Young ’s syndrome
    - ciliary dyskinesia in epid. head
- Acquired
  - infectious
    - tuberculosis, chlamydia
  - surgical damage
    - vasectomy
    - hernia repair
    - orchidopexy

VARICOCELE

- *15% of normal males*
- *40% of primary infertility*
  - *bilateral*
- *80% in secondary infertility*
  - *Deleterious effect*
  - *Effect of the heat, enzymatic*

VARICOCELE

Indications for surgery

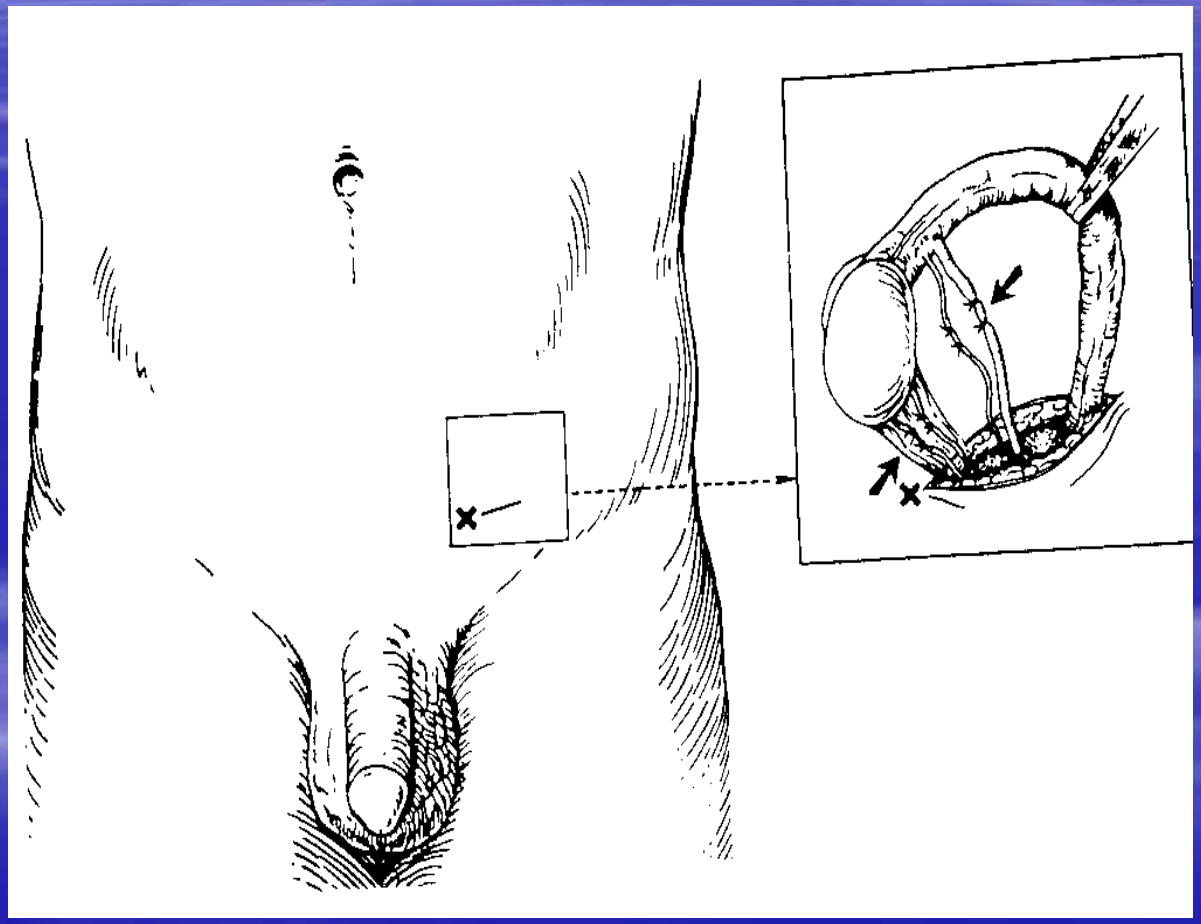
- *Infertility*
  - *Clinical « bag of worms »*
  - *Subclinical*
- *Scrotal pain*

VARICOCELE

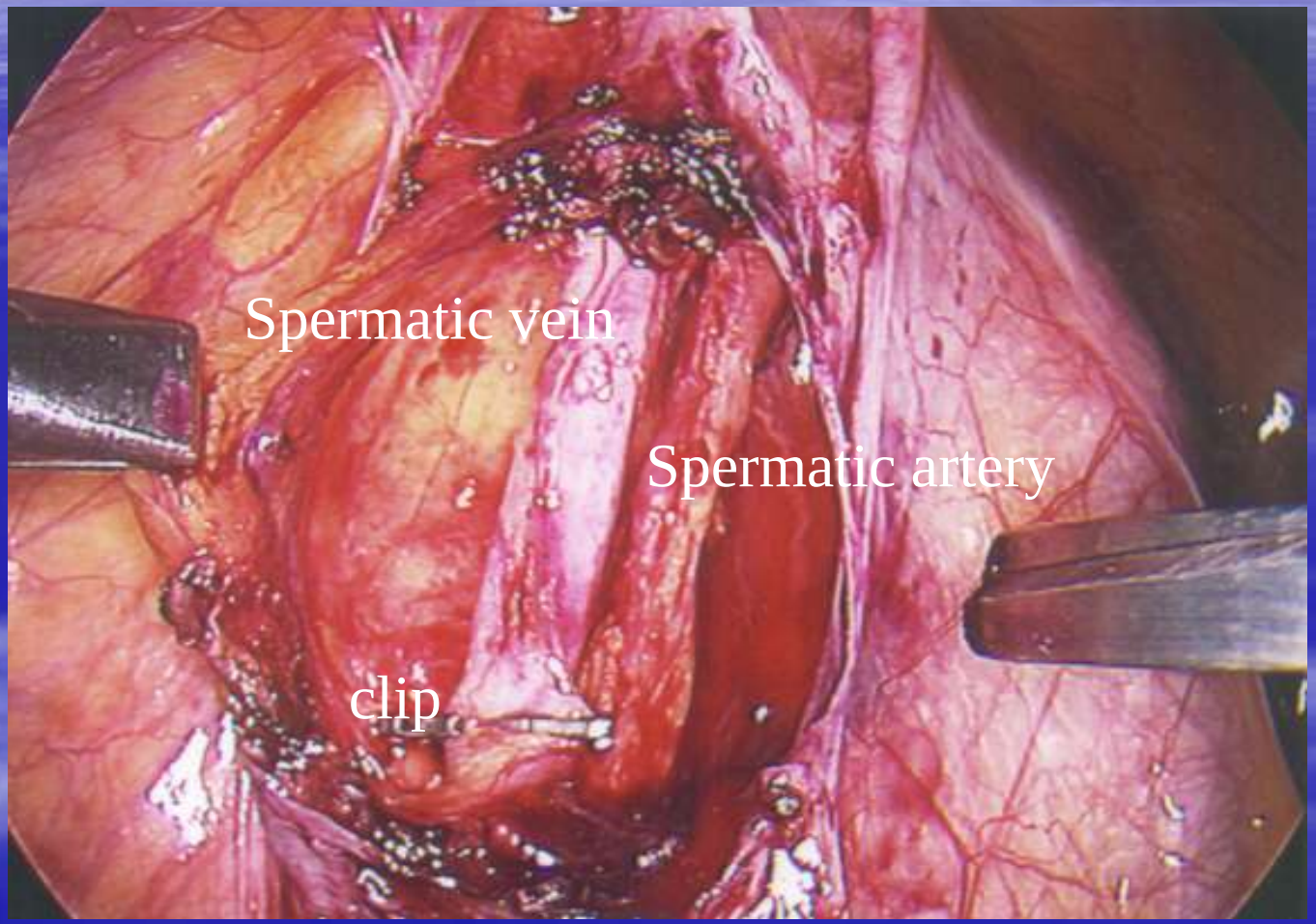
Techniques

- *High ligation*
  - *retroperitoneal, 2% failure*
- *Inguinal ligation*
  - *safe and easy, up to 21% failures*
- *Radiological embolization*
  - *cost and time effective, 12% failure*
- *Laparoscopy*
  - *needs skill. 2% failure (High ligation)*

Inguinal ligation



High Ligation (Laparoscopy)



VARICOCELE REPAIR

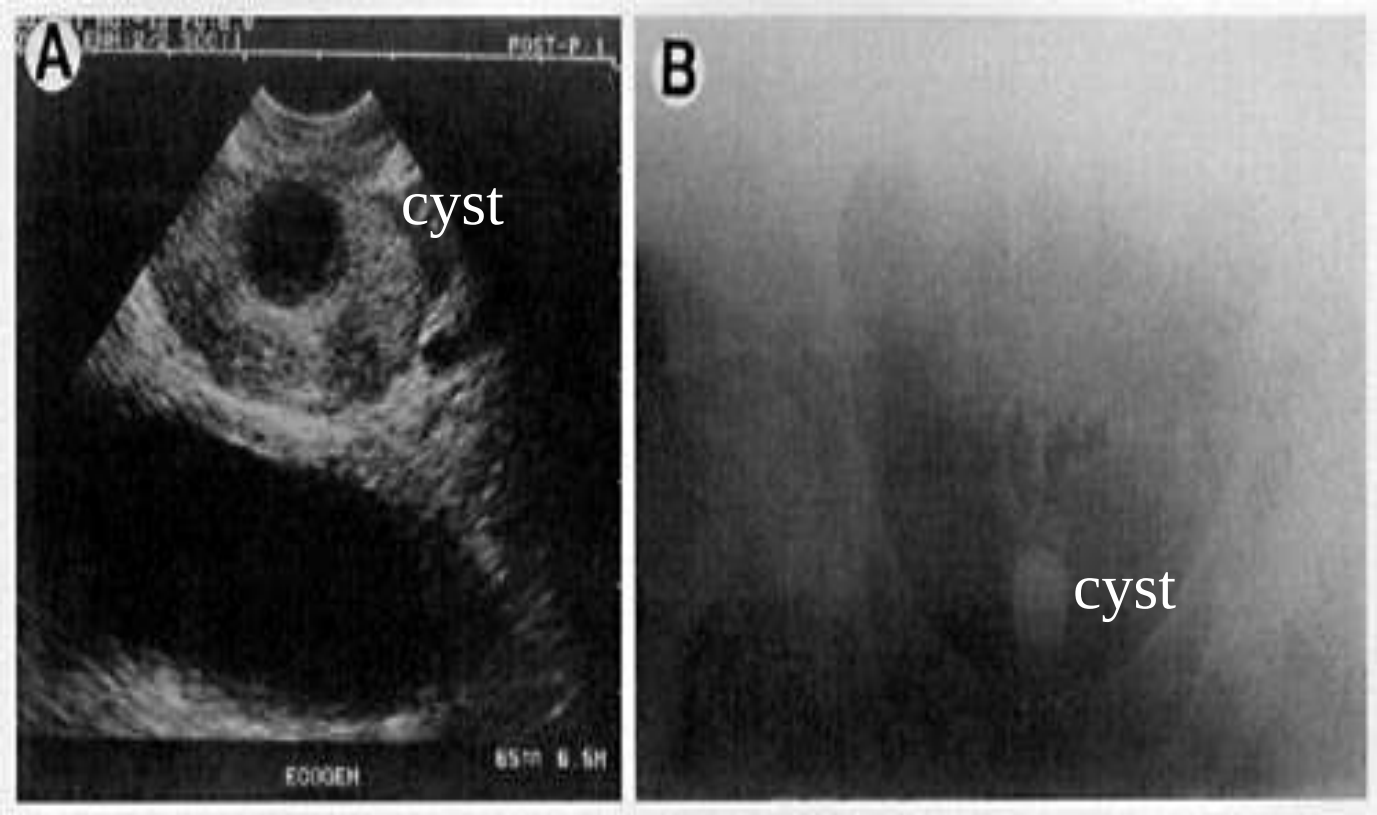
Results

- *50 to 90% improvement in semen quality*
- *30 to 50% pregnancies after 6 to 9 months*

Obstruction at the prostatic level

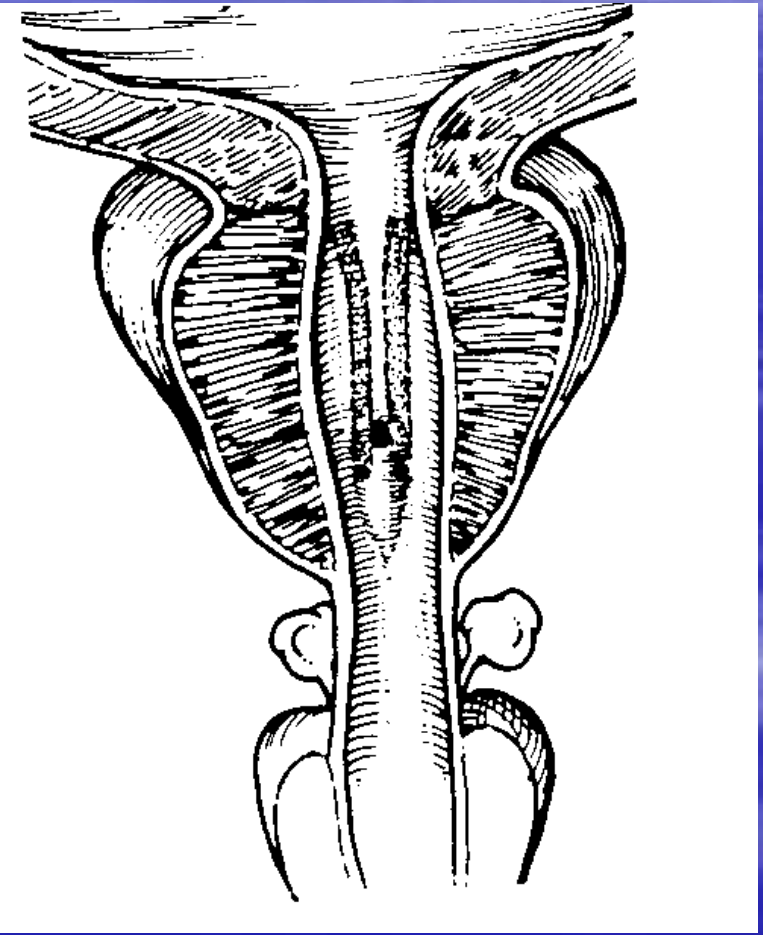
- *Compression or obstruction of the ejaculatory duct*
  - *Infectious, congenital Mullerian cyst, Wolffian malformation*
  - *Suspected by low semen volume*

Congenital Mullerian cyst



EJACULATORY DUCT RESECTION

- *Transurethral incision*
  - *resectoscope*
- *25% good result*
  - *importance of diagnosis*
- *Side effects*
  - *urinary reflux in the seminals*



Vaso-vasostomy
Indications

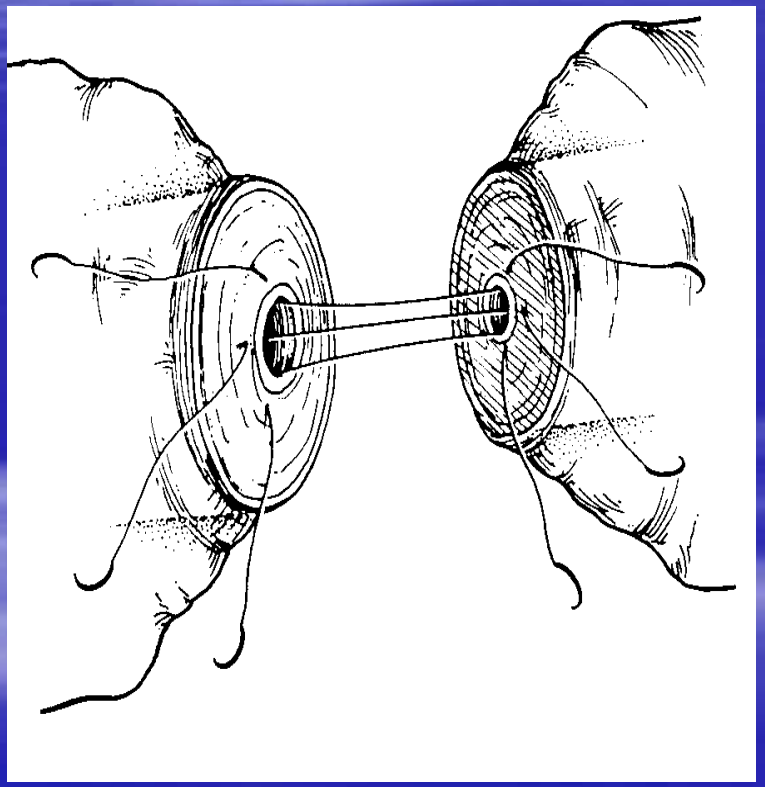
- *Post infectious stenosis*
- *Iatrogenic section*
- *Short segmental agenesis*
- *Vasectomy reversal*
  - *2-6% of vasectomies*

Vaso-vasostomy
Technique

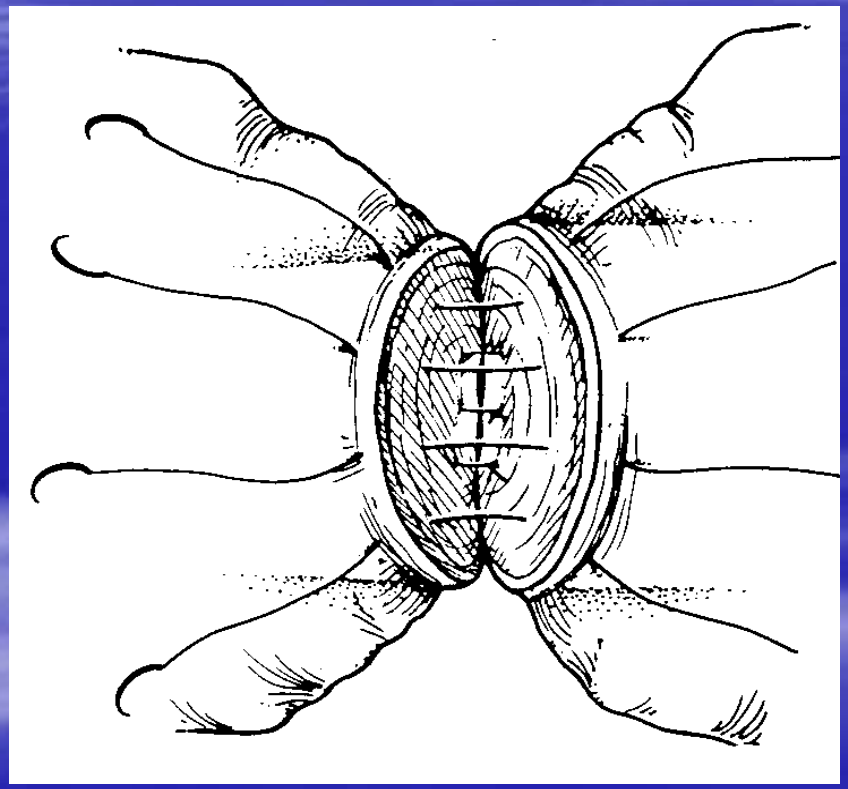
- *Two layer*
  - *microscope*
  - *Approximator*
  - *10-0 and 9-0 polyglycolic sutures*
- *Modified two layer*
  - *magnification*
  - *9-O monofil. polyglycolic*
- *Other techniques*
  - *glue, rod, laser*....
  - Robotic “da Vinci”

Goldstein 's microspike approximator

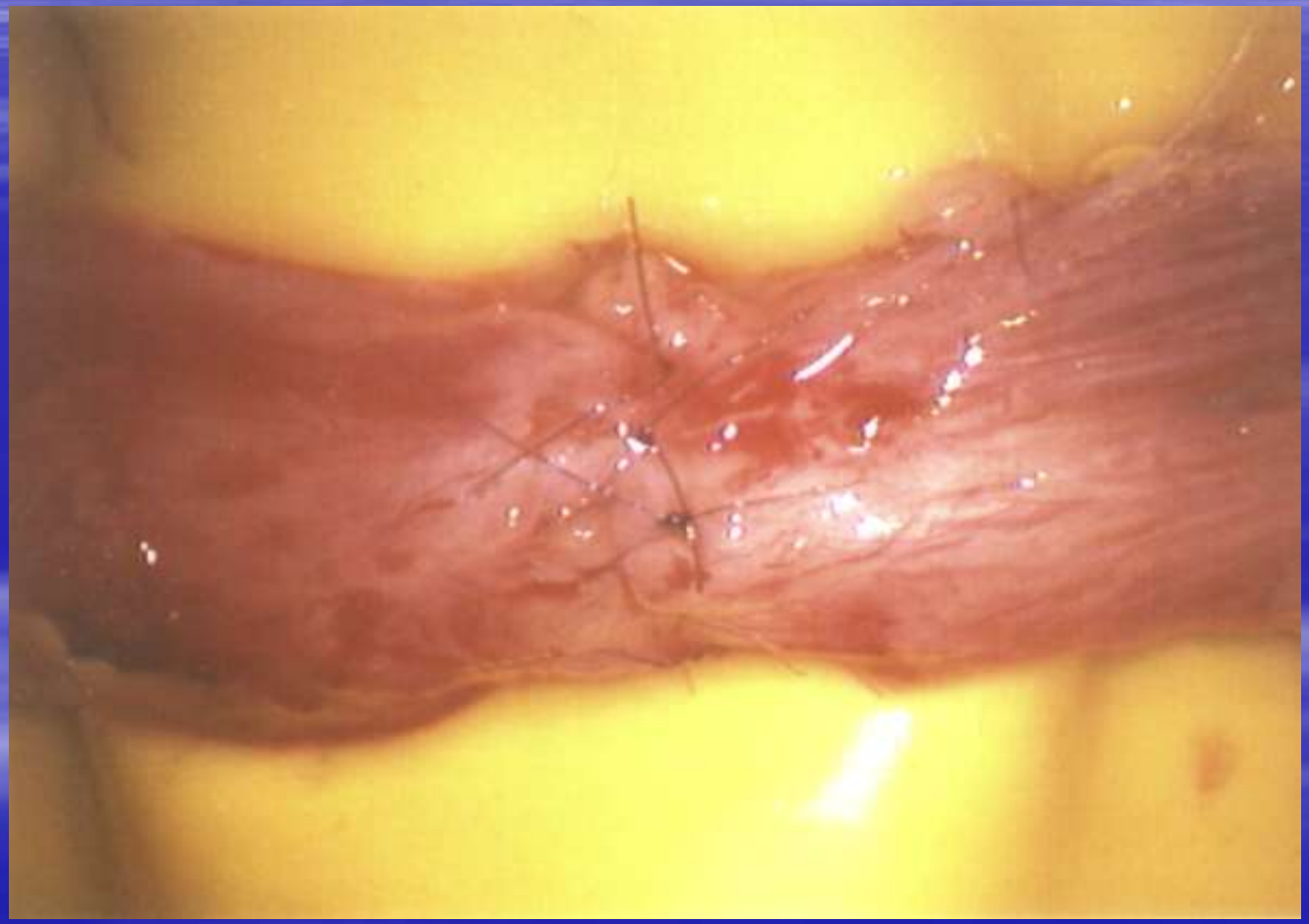
Two-layer vaso-vasostomy



Two-layer vaso-vasostomy



Two-layer vaso-vasostomy



Vaso-vasostomy Results

- *90 % patency rates*
- *60% pregnancy rate*
- *delay after vasectomy to be considered before surgery*

Vasectomy Reversal >15 years & pregnancy rate (PR)

- *Overall* *45% PR*
- *15-19 years* *49% PR*
- *20-24 years* *39% PR*
- *> 25 years* *25% PR*

antisperm antibodies?
epididymal alteration?

Spousal age & PR after vasectomy reversal

- *< 25 years* — *57% PR*
- *26-30 years* — *58% PR*
- *31-35 years* — *49% PR*
- *36-40 years* — *45% PR*
- *41-45 years* — *20% PR*
- *> 45 years* — *0% PR*

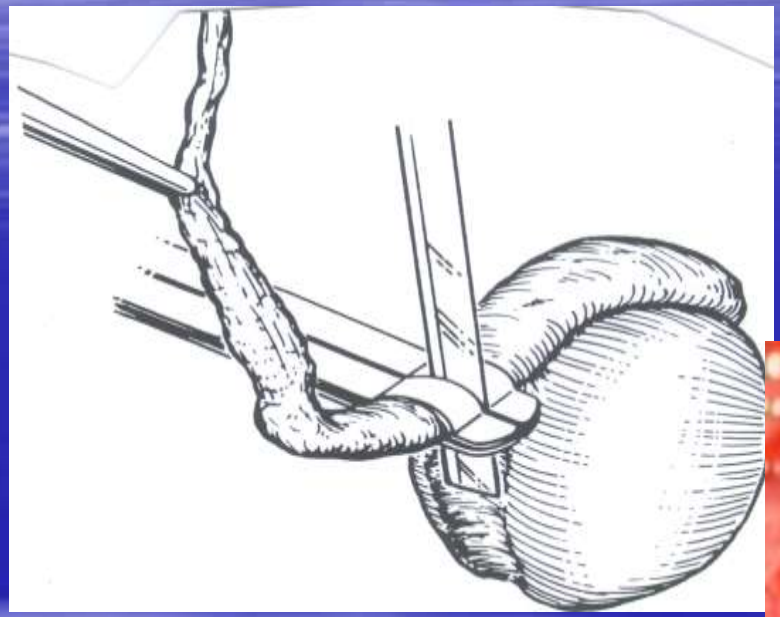
Vaso-epididymostomy
Indications

- *Best in case of obstruction at the level of the body or the tail of the epididymis.*
- *Poor at the level of the rete testis*
- *Some vasectomy reversal failure*

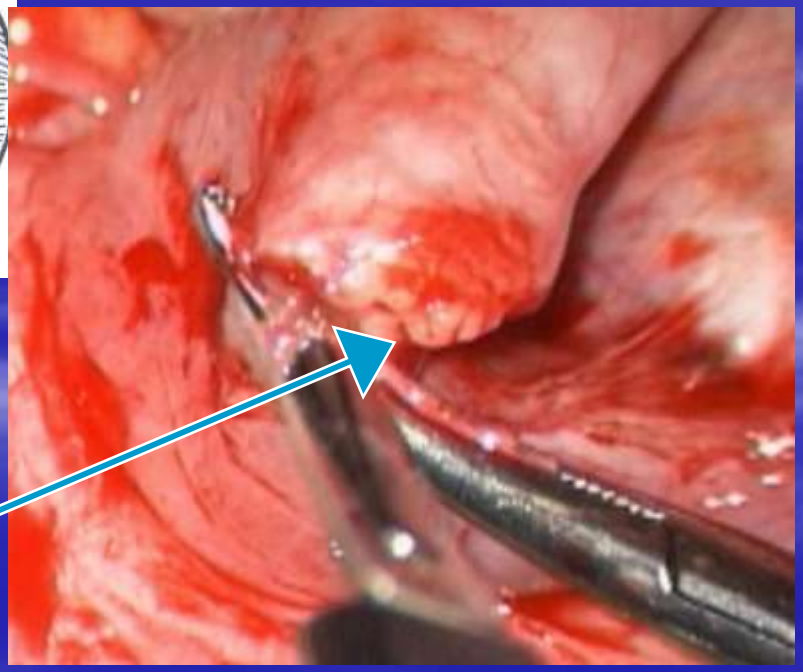
Vaso-epididymostomy
Techniques

- *Termino-terminal*
  - *The epididymis is transected, exposing the efferent tubule*
  - *3 to 4 10-0 sutures approximating the mucosas then 6 to 8 9-0 sutures securing the serosa*
- *Latero-terminal (easier technique)*
  - *The epididymis is incised and a tubule laterally opened*

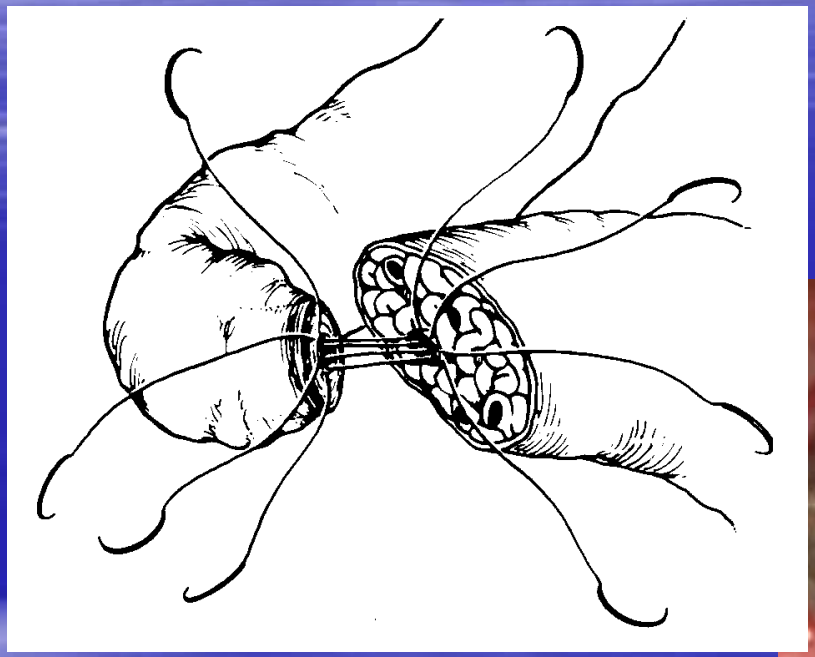
Termino-terminal



Transecting the epididymis

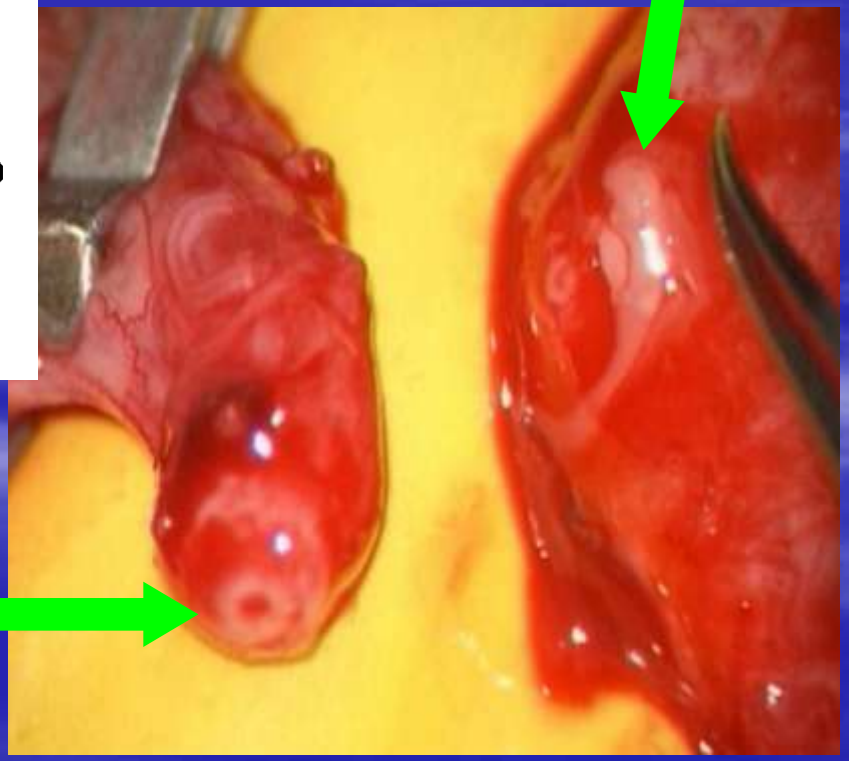


Termino-terminal

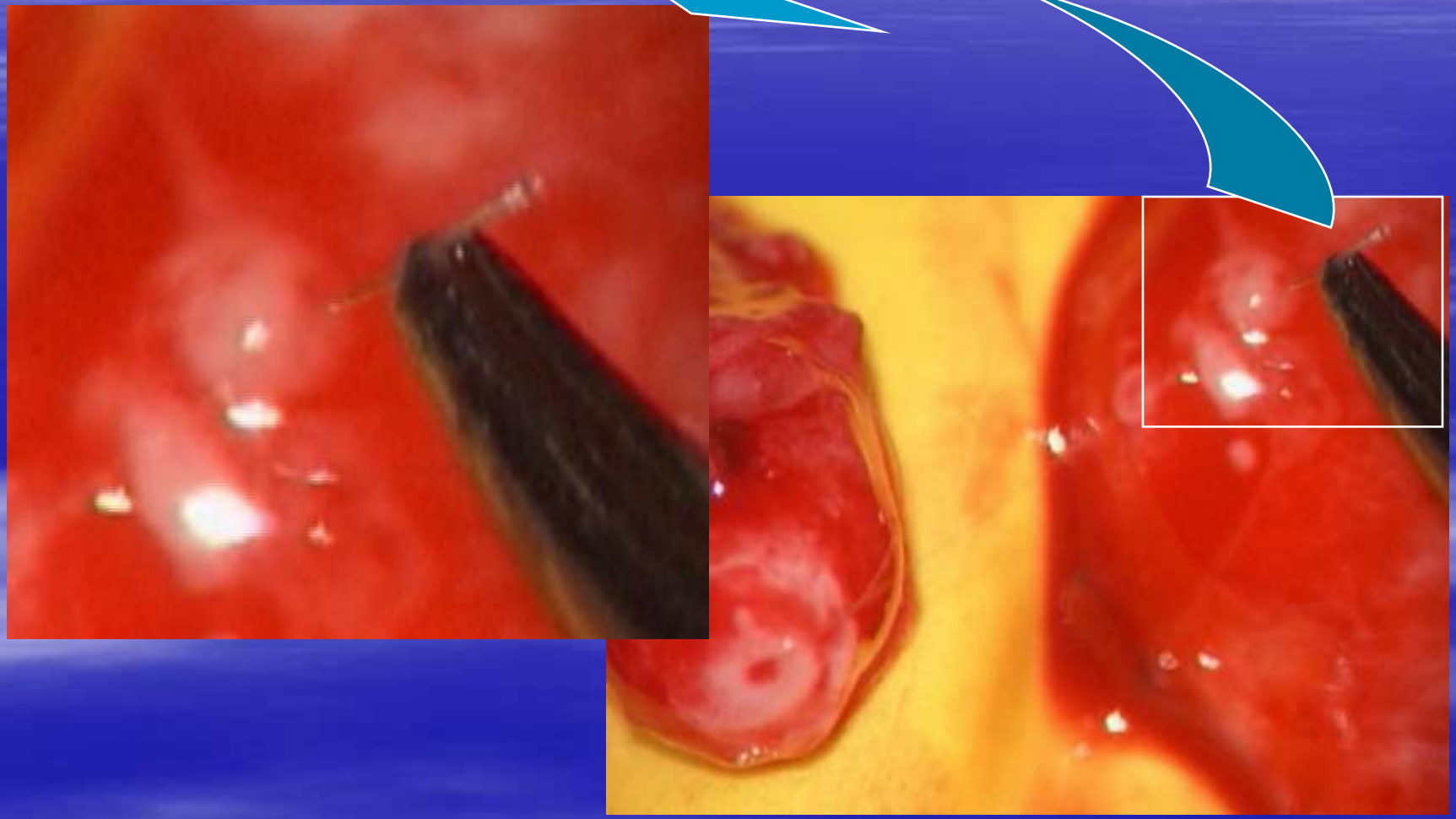


Spermatic fluid

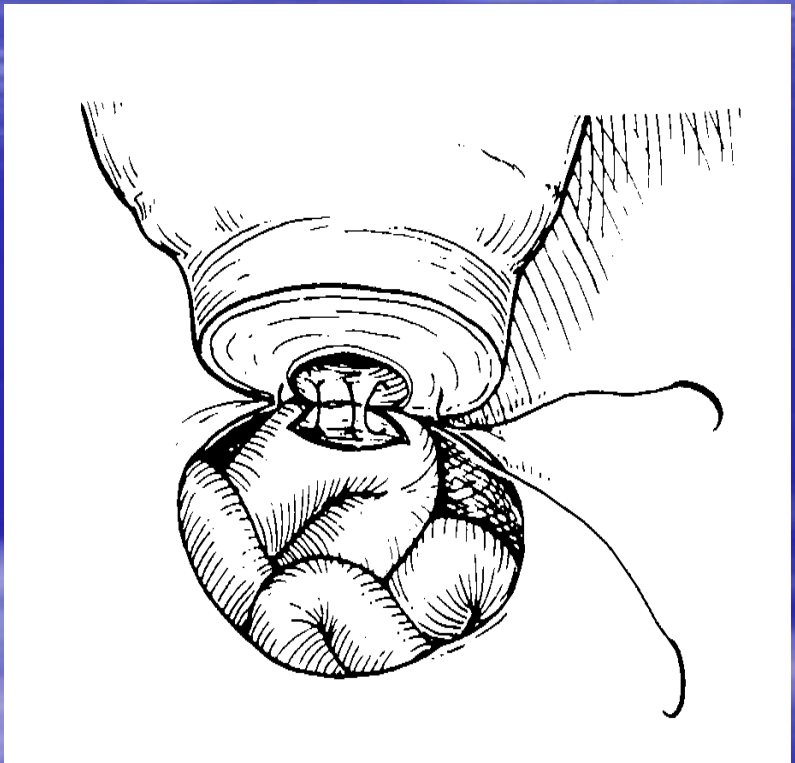
vas

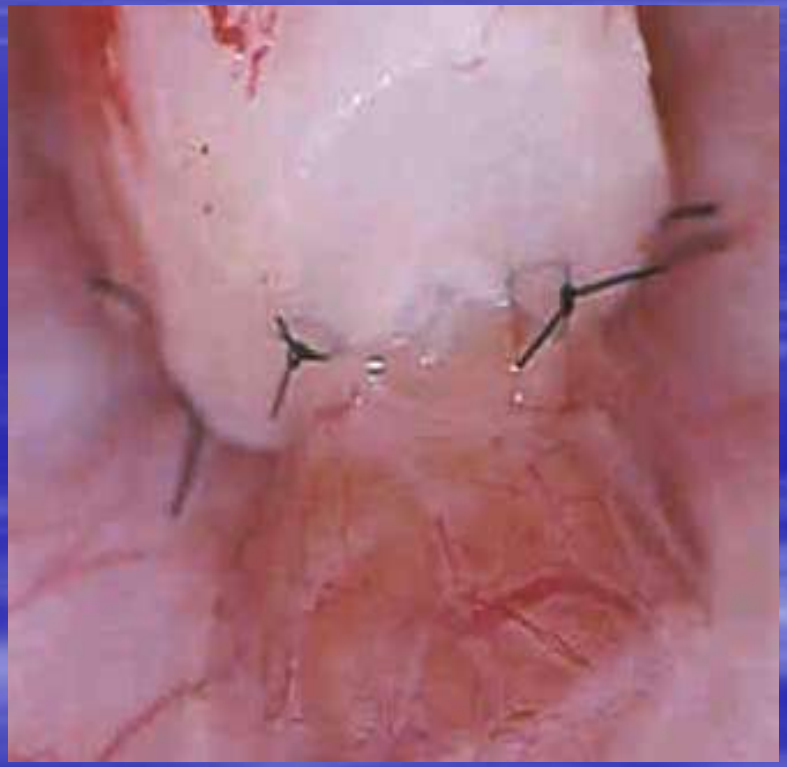


Termino-terminal

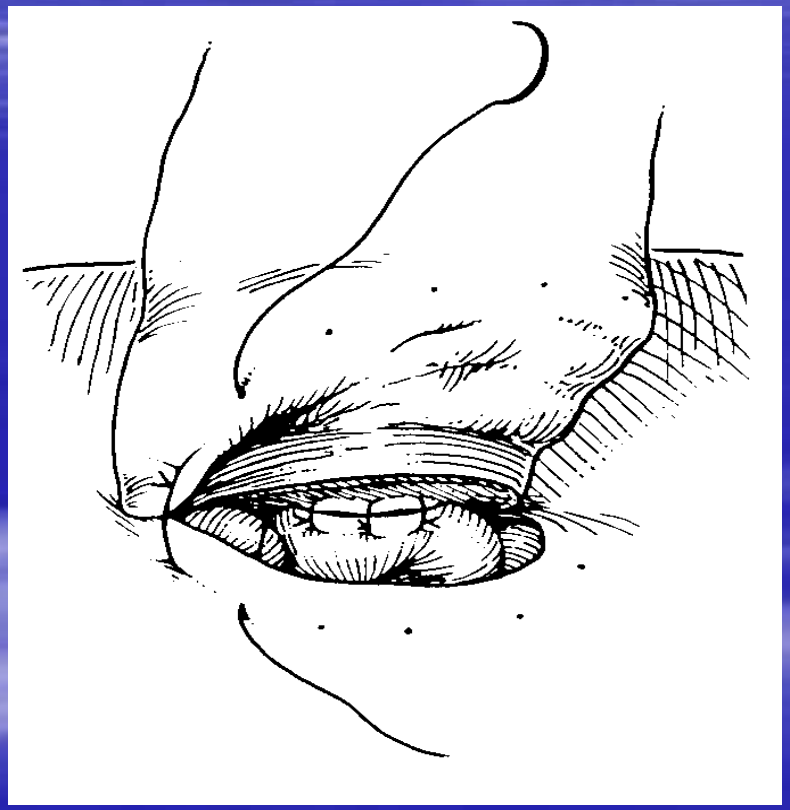


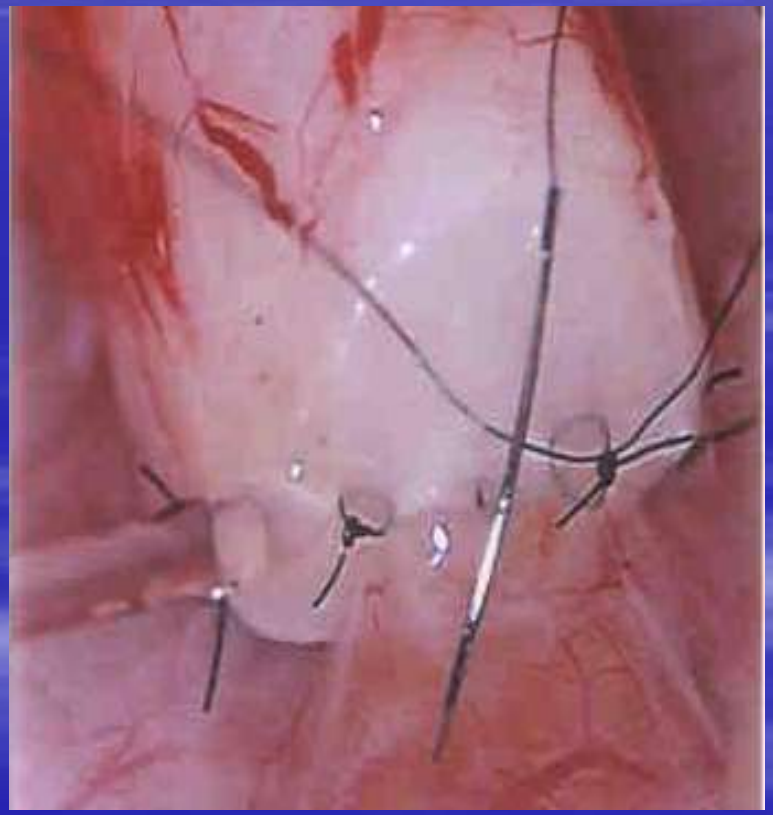
Latero-terminal





Latero-terminal





Vaso-epididymostomy
Results

- *Patency rate approx. 64%*
- *Pregnancy rate 30%*

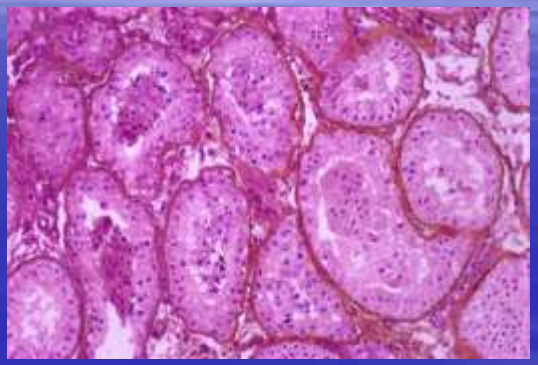
Epididymal sperm aspiration M.E.S.A.

- *Not a treatment*
- *Combined with I.C.S.I.*
- *Depends more on the skill of the biologist then of the surgeon*
- *Microscopic procedure*

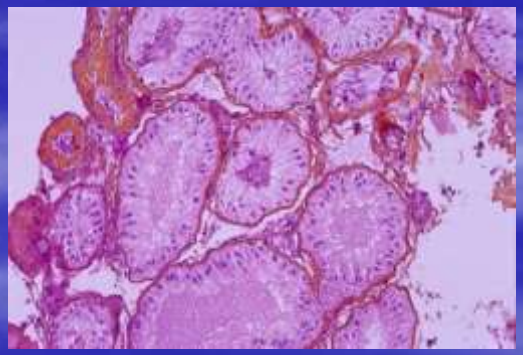
I.C.S.I. with testicular biopsy (TESE)

- Sampling of spermatozoa in testicular fragments
  - 50% after negative former biopsy even with elevated FSH
  - in almost all obstructive cases
  - higher vitality
- Spermatides, germinal cells
- No microscope

I.C.S.I. with testicular biopsy (TESE)



normal



s.c.o.

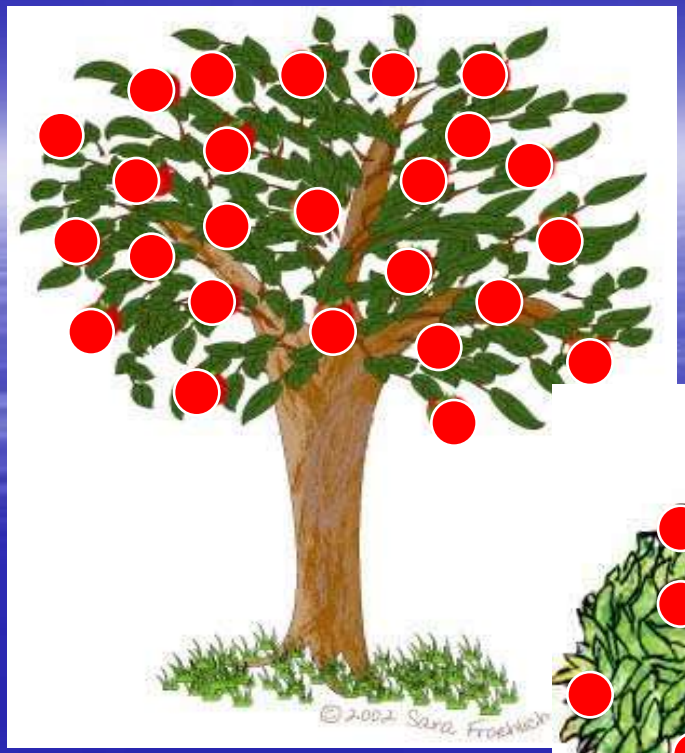
Courtesy Dr H.Lucas

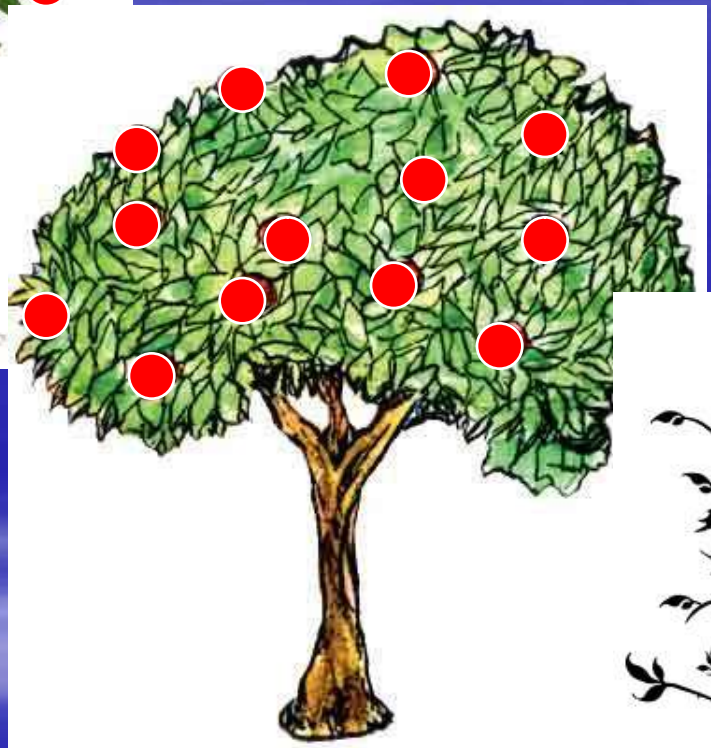
TESE
the « Picking » technique

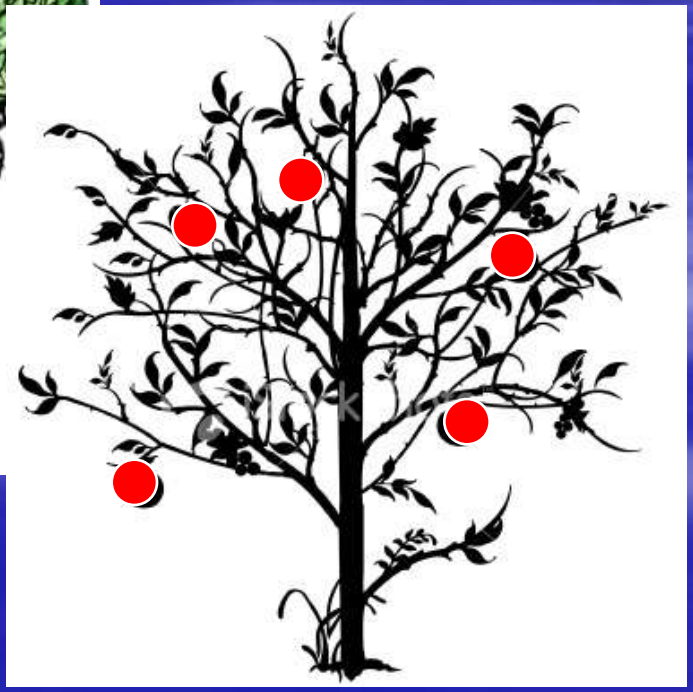
- Picking of production zones
- Less testicular tissue needed
- Better results
- Tensionfree running suture (%/0 polyglycolic)
- Local anesthetic at the end of procedure

G.A. de Boccard, 1996

Picking of production zones like fruits from a tree



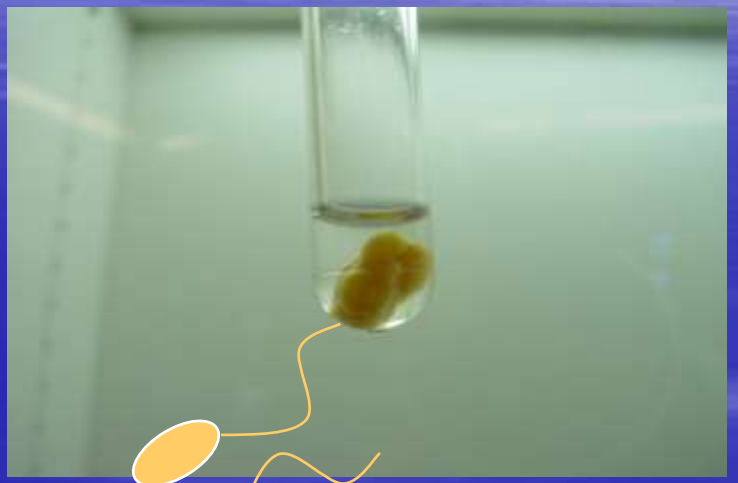




Avoid testicular damage

G.A. de Boccard, 1996

I.C.S.I. with testicular biopsy (TESE)



frozen

Results of TESE + ICSI

2.2 embryos transferred
22% twin pregnancies

- *Fertilization: 60 %/inj.oocyte*
- *pregnancies fresh: 32.8 % /transf.*
- *pregnancies froz.: 20.8 % /transf.*
- *CUMULATED: approx. 50%*

H.Lucas 2002

ICSI and Genetical risk

- *Cystic fibrosis*
- *Microdeletion of Y chromosome*
- *Klinefelter syndrome*

17 % of severe oligozoospermia
34 % of azoospermia

Never do a biopsy for diagnostic purpose alone

FREEZE !!!

CONCLUSION

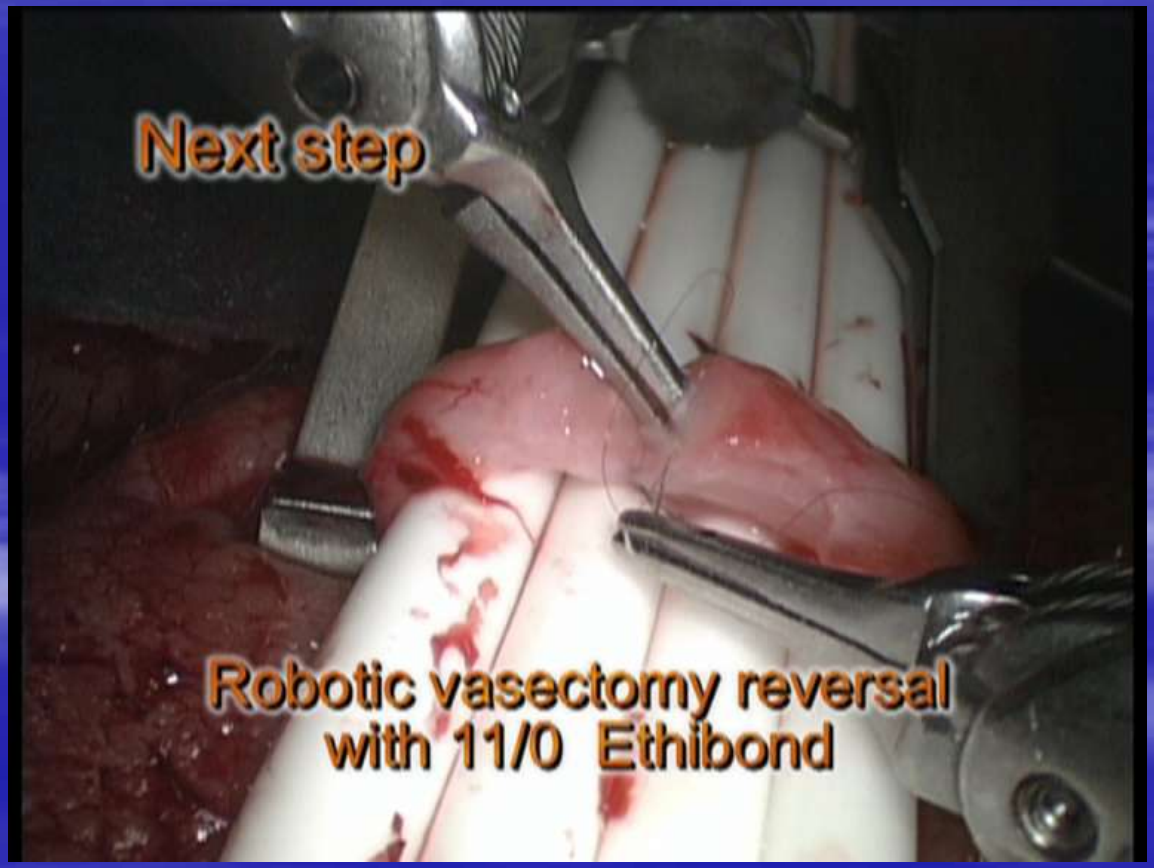
We are improving our ability to treat male causes of infertility in two different ways:

Microsurgery and the development of endoscopic tools will allow us to cure an increasing number of patients.

I.C.S.I. coupled with TESE gives a chance to those who cannot be treated.

What future for microsurgery?

- Robotic microsurgical procedures
  - da Vinci
    (Intuitive surgical inc.)



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Thank you

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