SURGICAL TREATMENT OF MALE INFERTILITY

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Training Course in Reproductive Health/ Sexual Health Research

Geneva Foundation for Medical Education and Research

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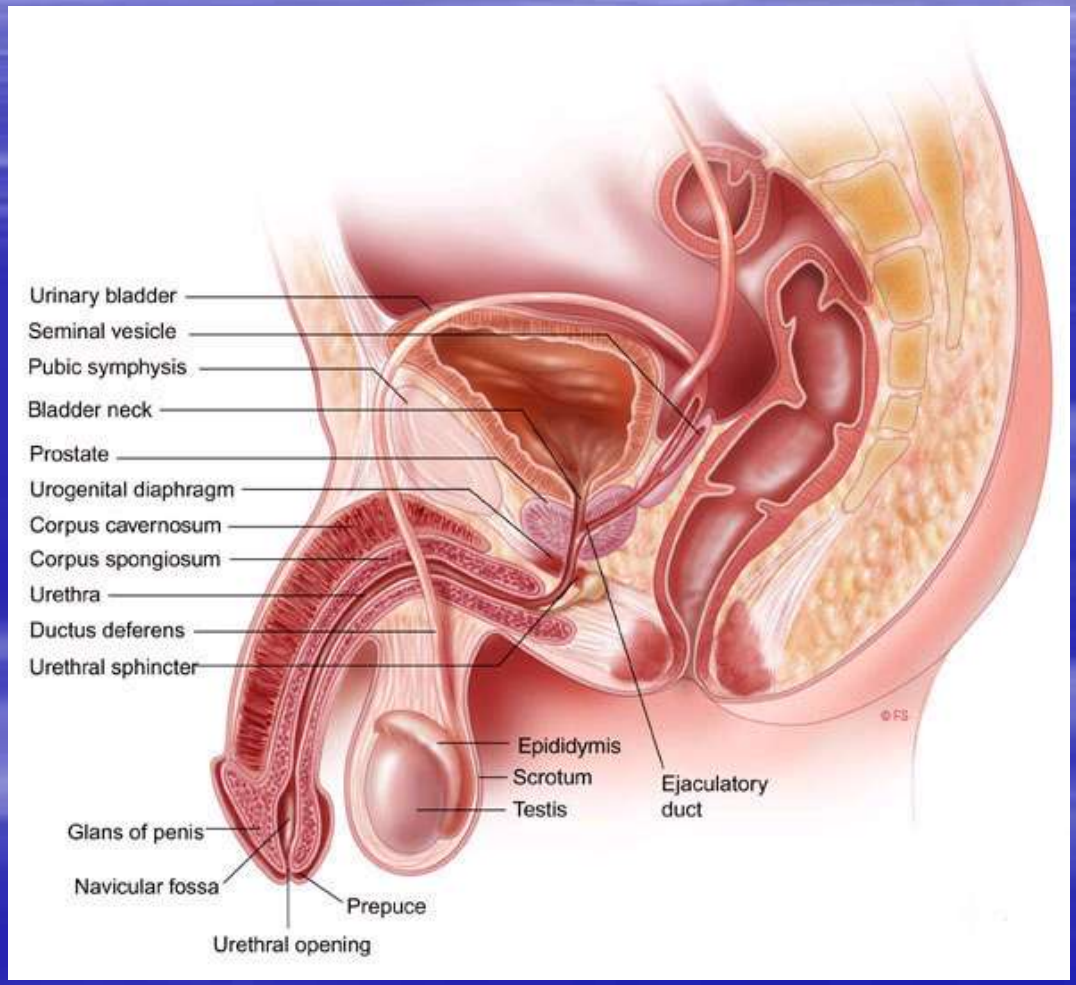
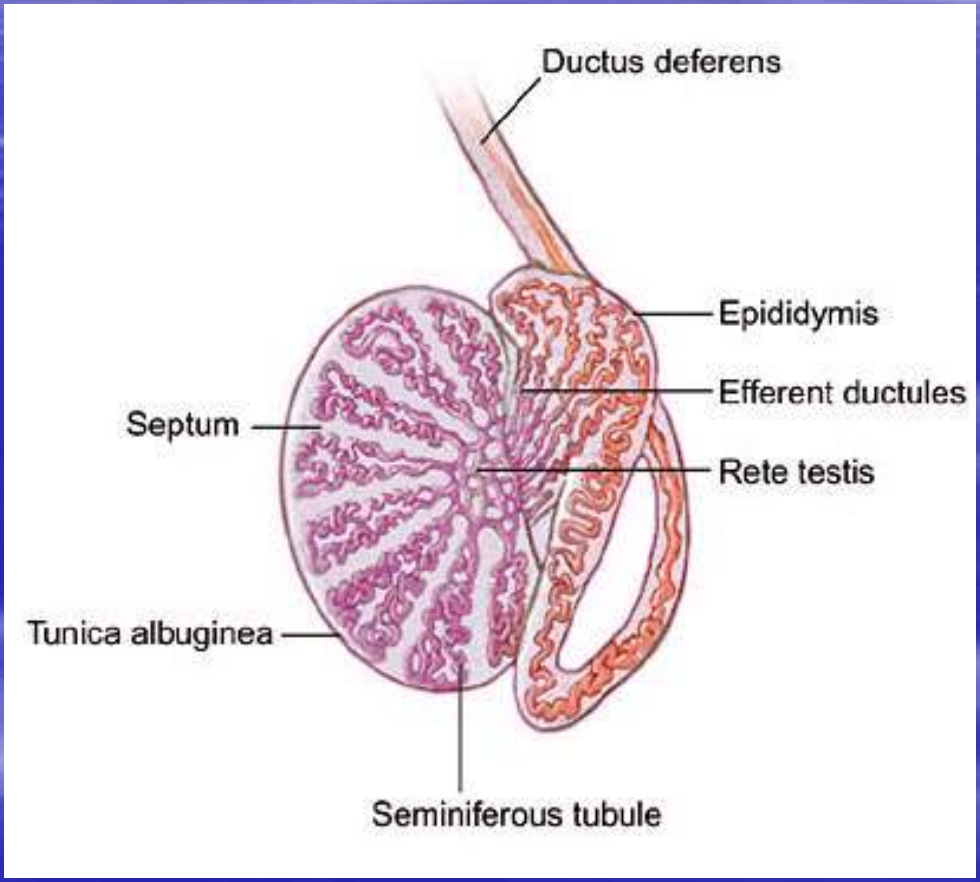
Anatomy



UrologyHealth.org Anatomical Drawings

Anatomy



UrologyHealth.org Anatomical Drawings

Causes of male infertility(1)

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

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 epididymal 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

Indication for surgery

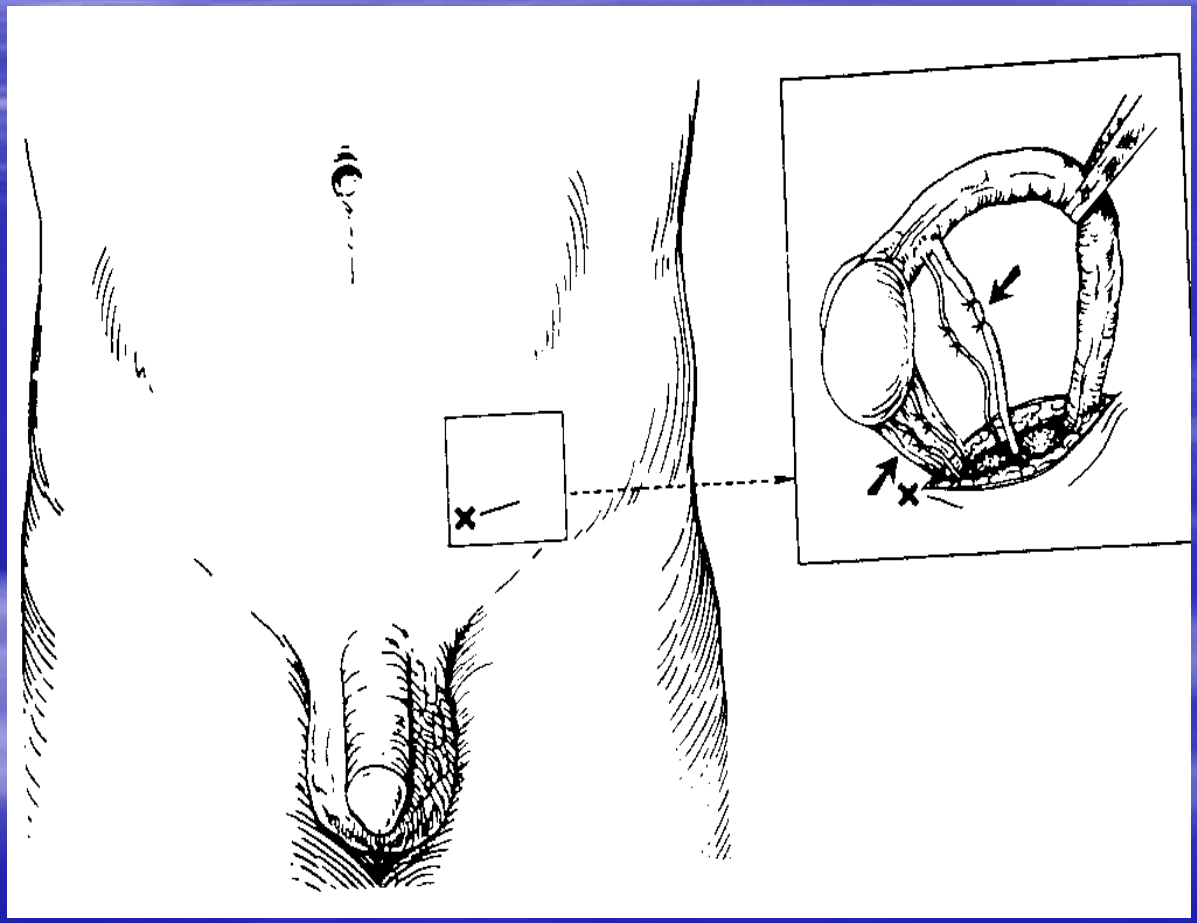
- *Infertility*
  - *Clinical « bag of worms »*
  - *Subclinical*
- *Scrotal pain*

VARICOCELE

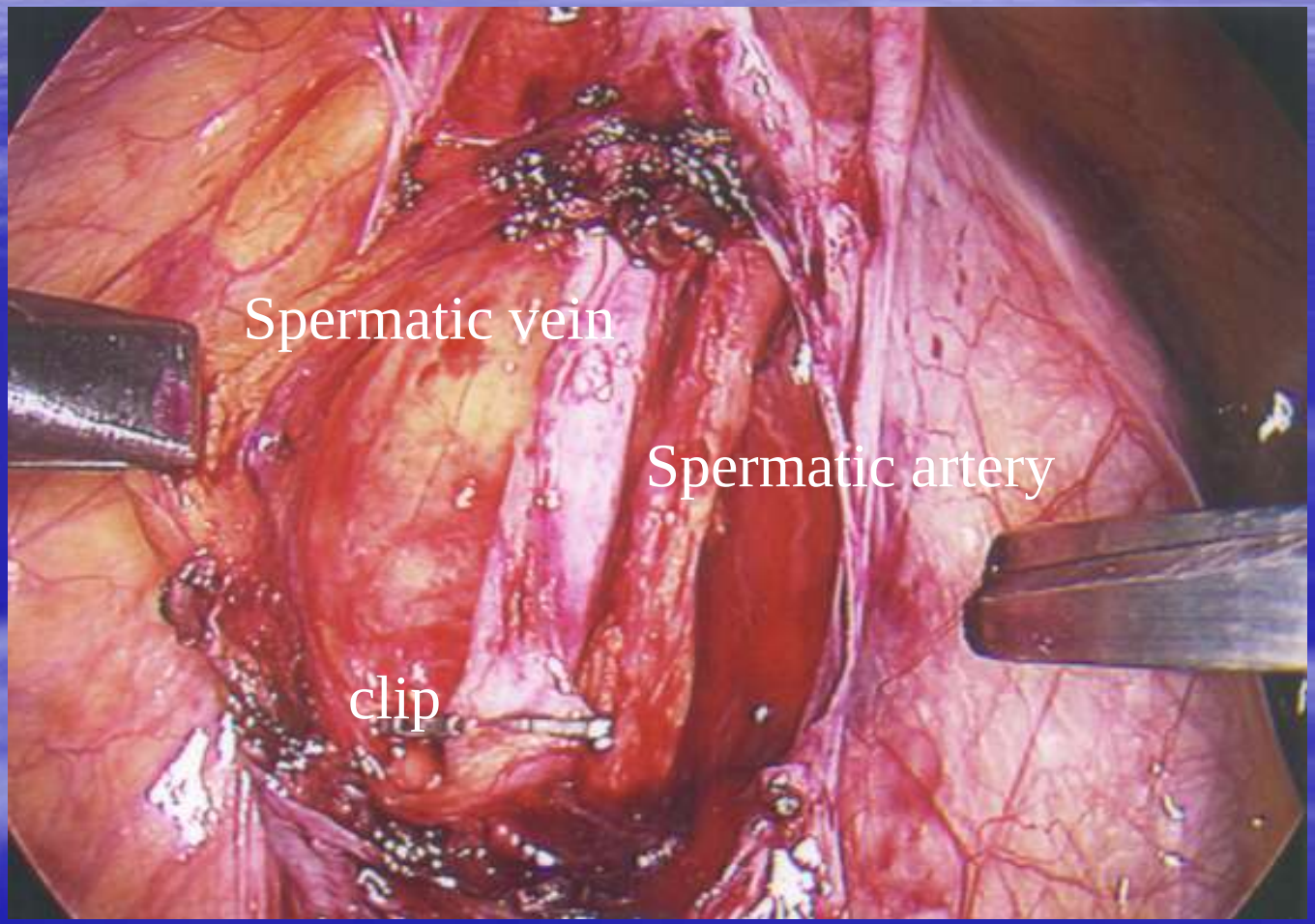
Techniques

- *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

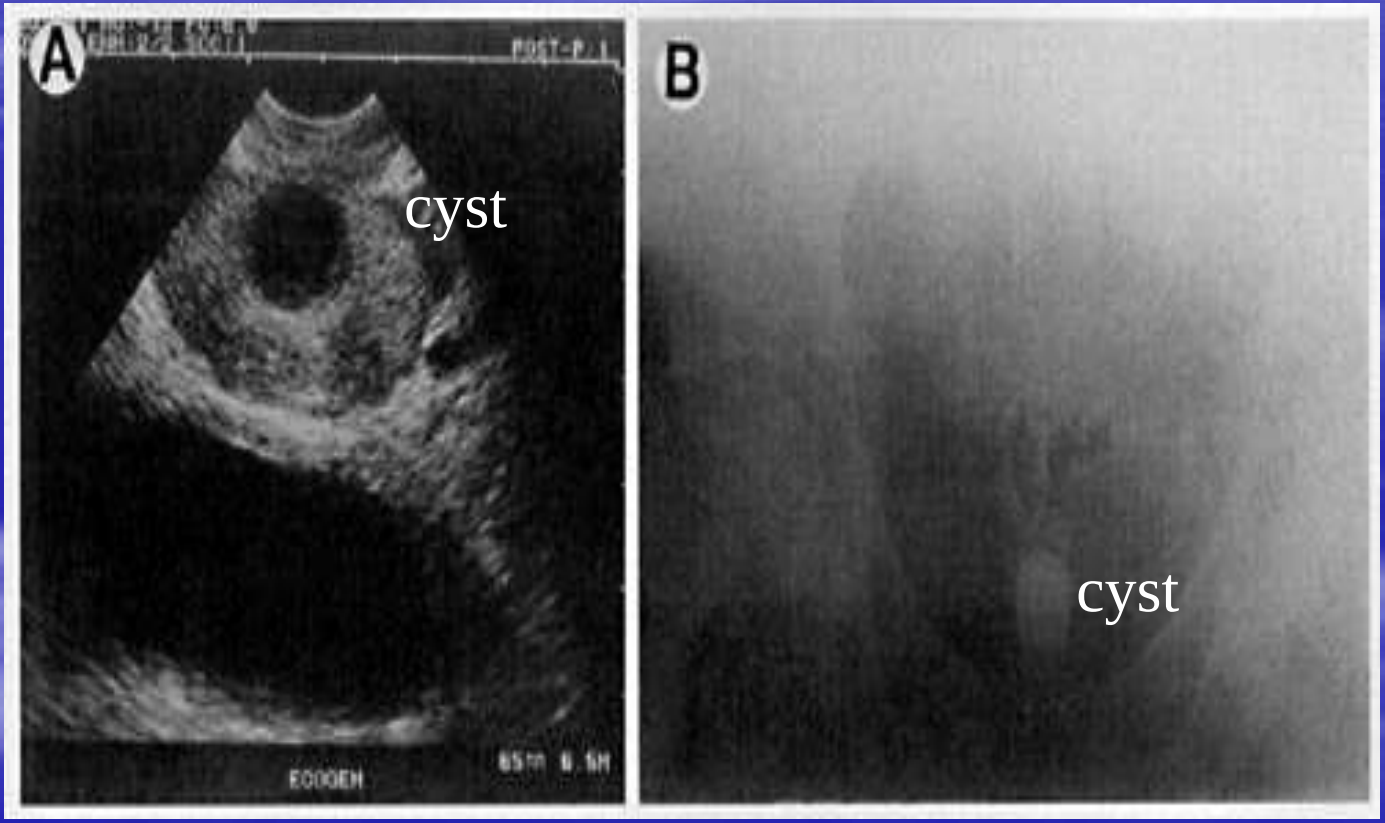
Results

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

Obstruction at the prostatic level

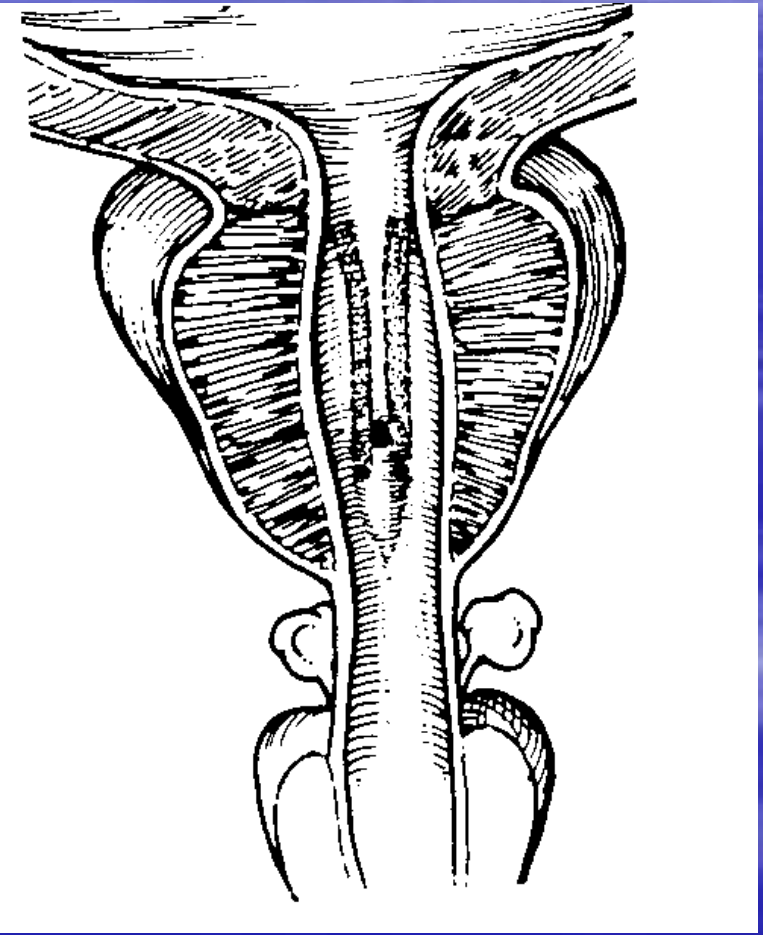
- *Compression or obstruction of the ejaculatory duct*
  - *Infectious, congenital Mullerian cyst, Wolffian malformation*
  - *Suspected by low semen volume*

Congenital Mullerian cyst



EJACULATORY DUCT RESECTION

- *transurethral incision*
  - *resectoscope*
- *25% good result*
  - *importance of diagnosis*
- *Side effects*
  - *seminal vesicle urinary reflux*



Vaso-vasostomy
Indications

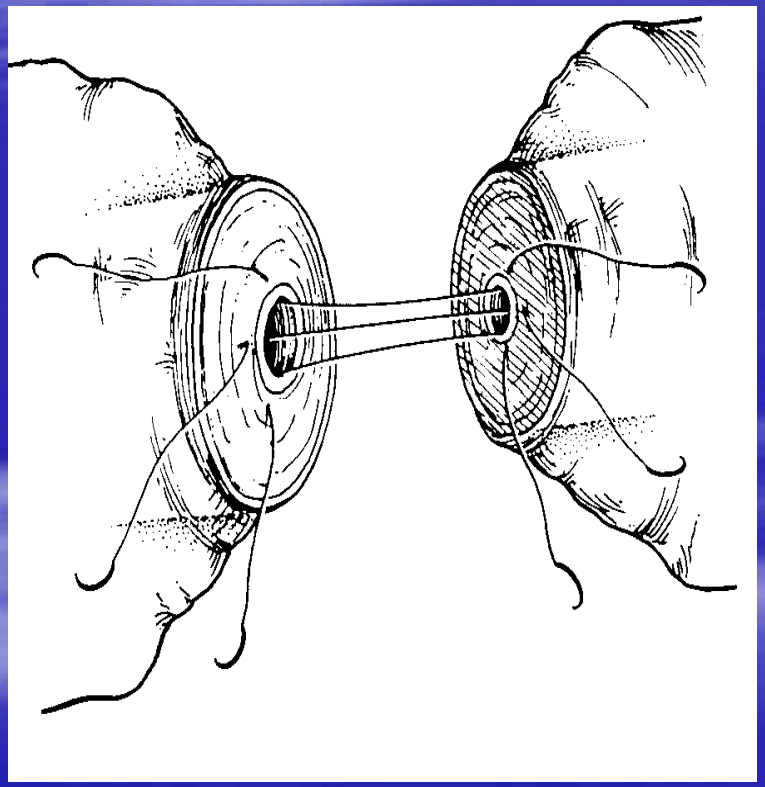
- *Post infectious stenosis*
- *Iatrogenic section*
- *Short segmental agenesis*
- *Vasectomy reversal*
  - *2-6% of vasectomies*

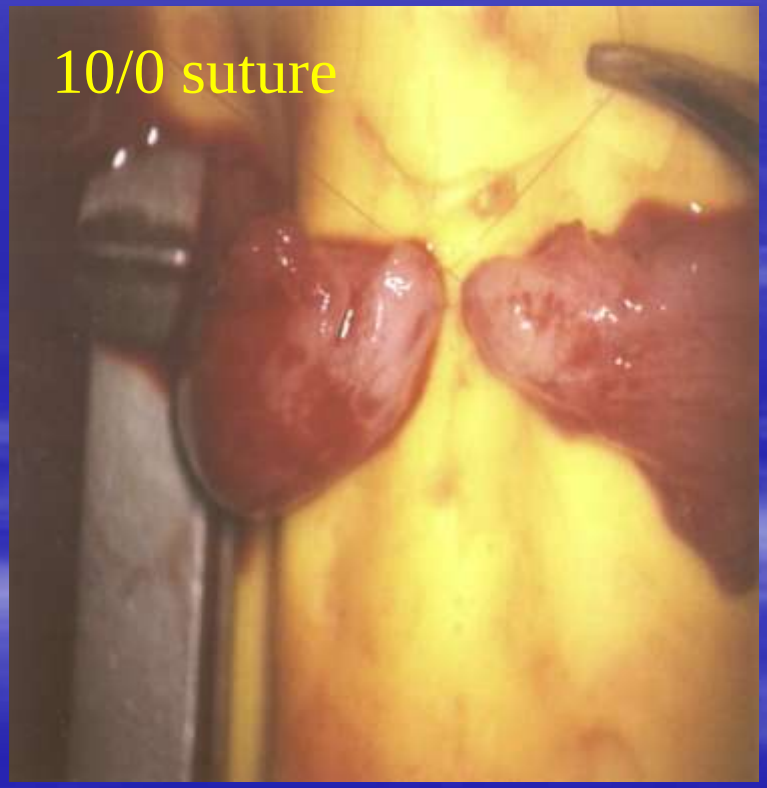
Vaso-vasostomy
Technique

- *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”

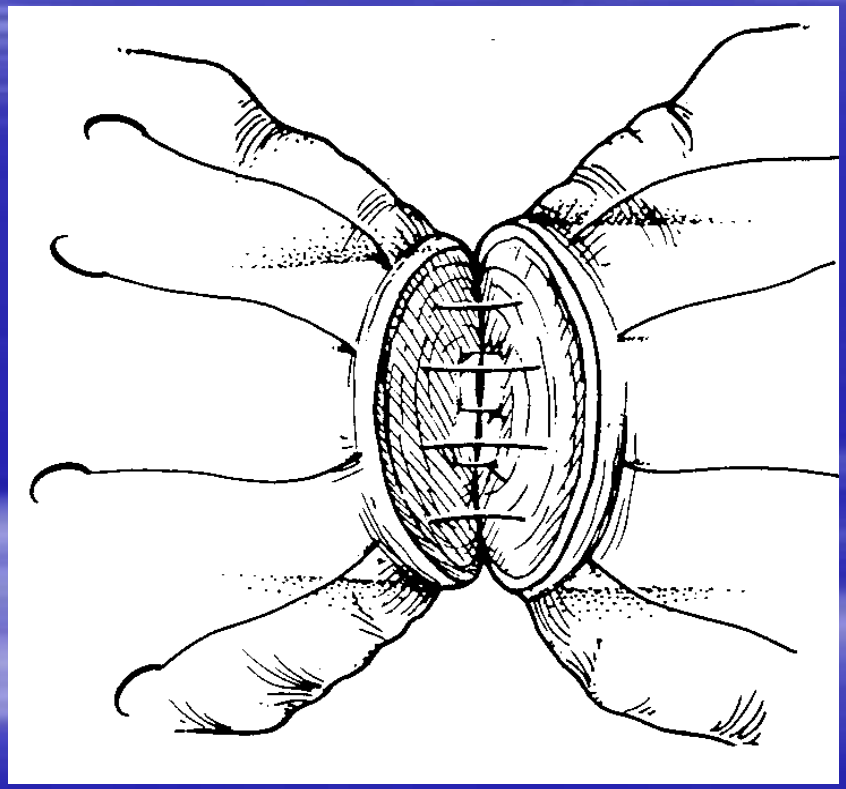
Goldstein's microspike approximator

Two-layer vaso-vasostomy

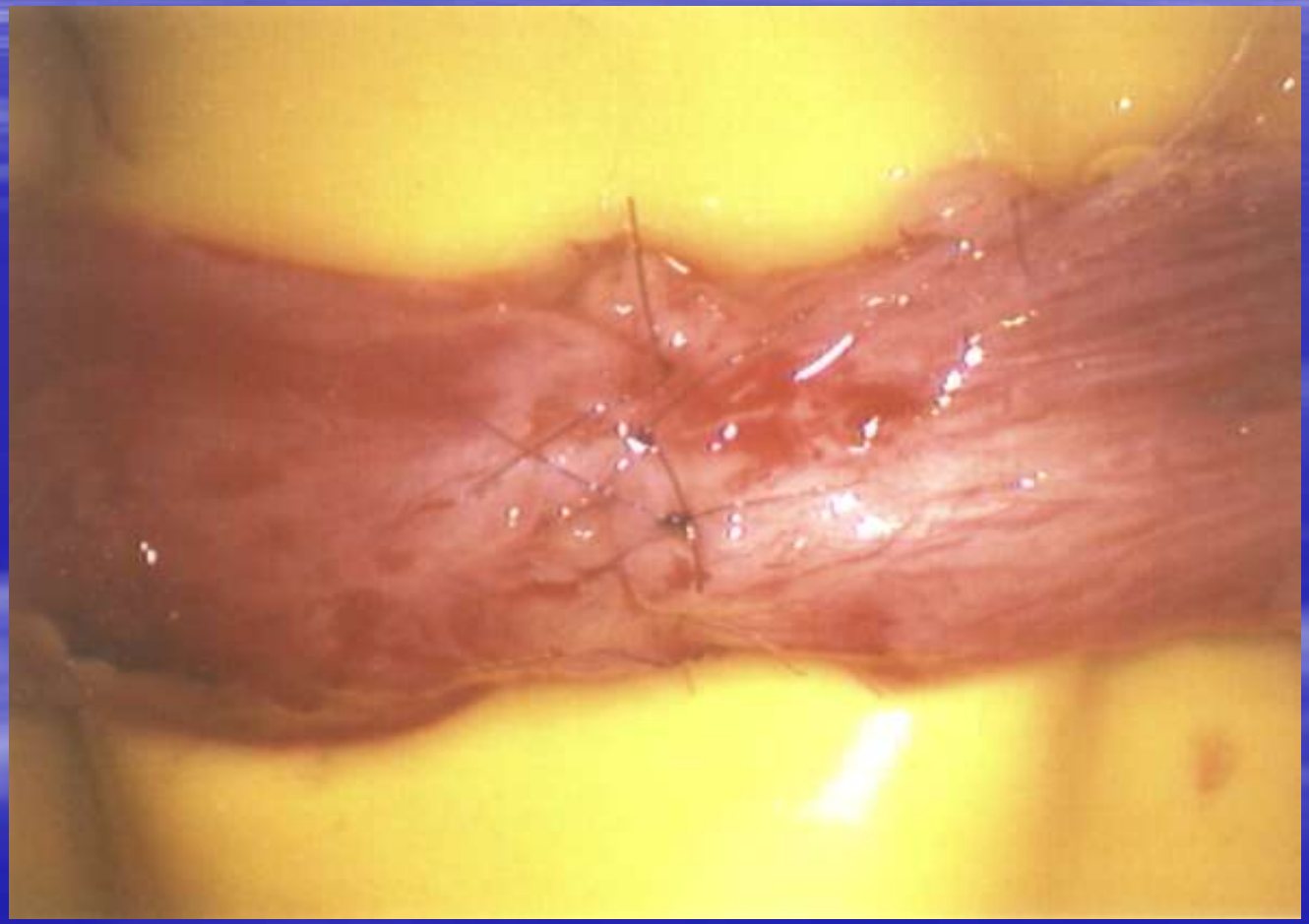




Two-layer vaso-vasostomy



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)

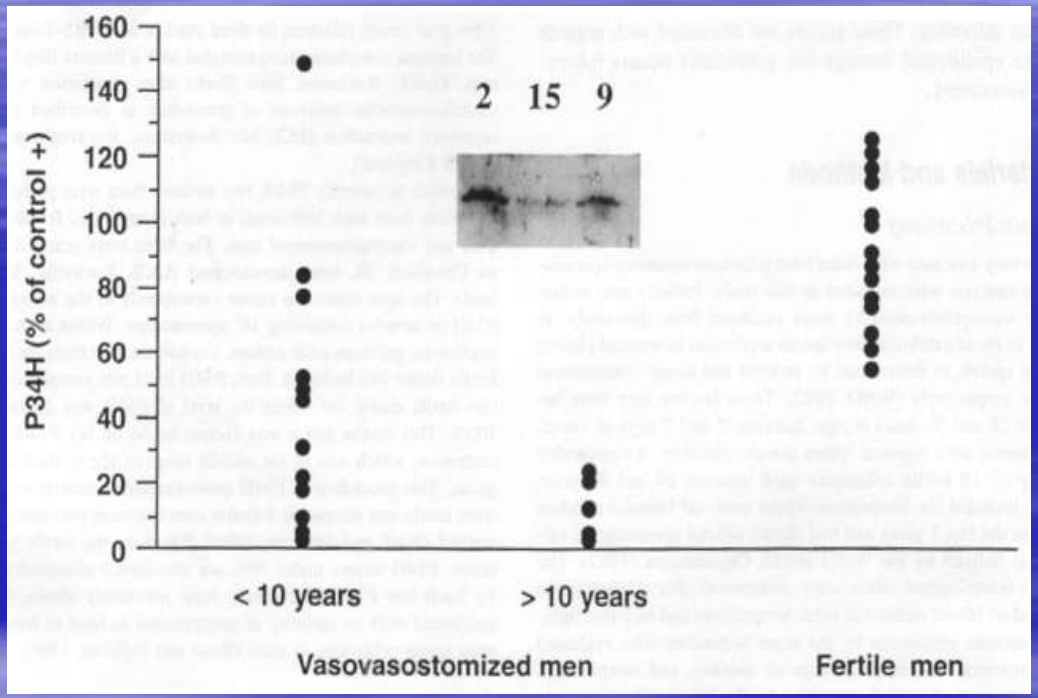
- *Overall* *45% PR*
- *15-19 years* *49% PR*
- *20-24 years* *39% PR*
- *> 25 years* *25% PR*

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*

Vasectomy reversal and epididymal P34H



Protein localized on the head of the spermatozoa

Necessary for the fixation to the pellucide membrane

No effect on motility

P34H is an epididymal marker proving that vasectomy causes alteration of the epididymis

(Guillemette et al., 1999)

Courtesy Dr H.Lucas

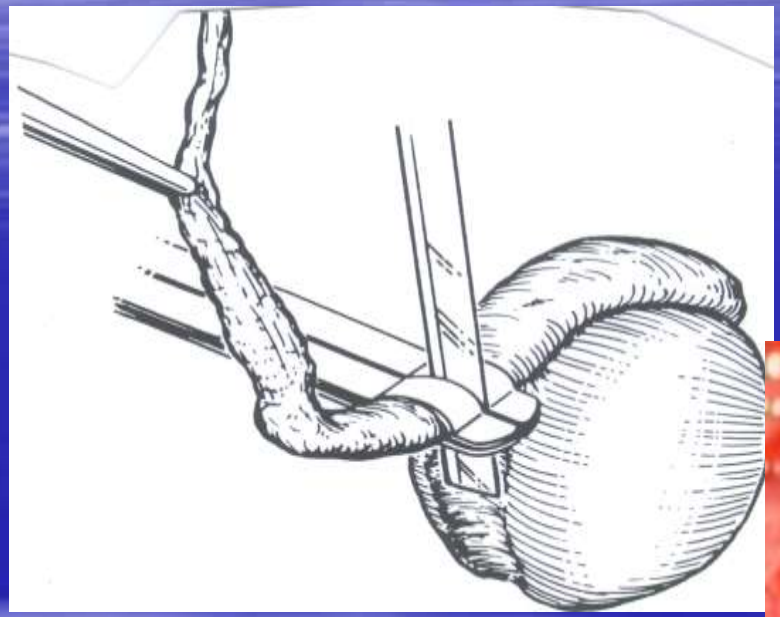
Vaso-epididymostomy
Indications

- *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*

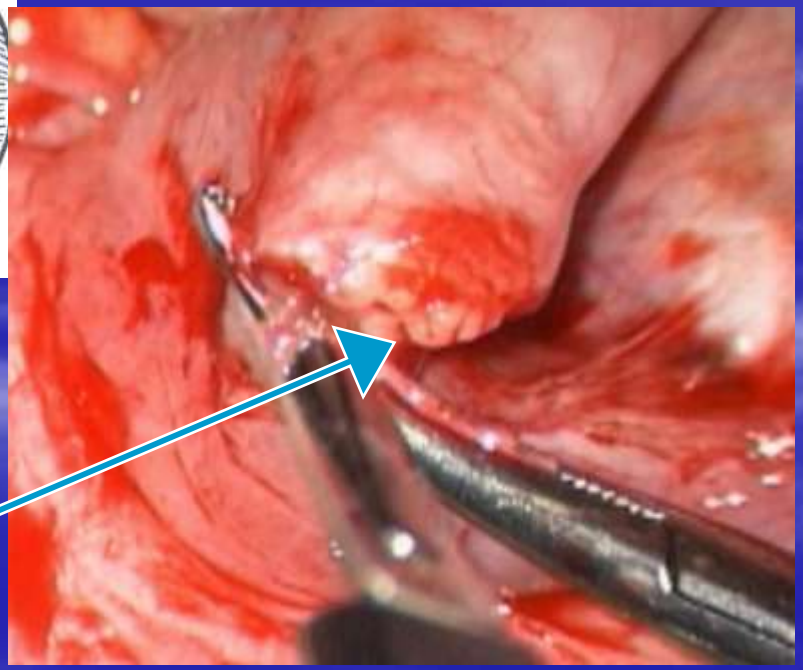
Vaso-epididymostomy
Techniques

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

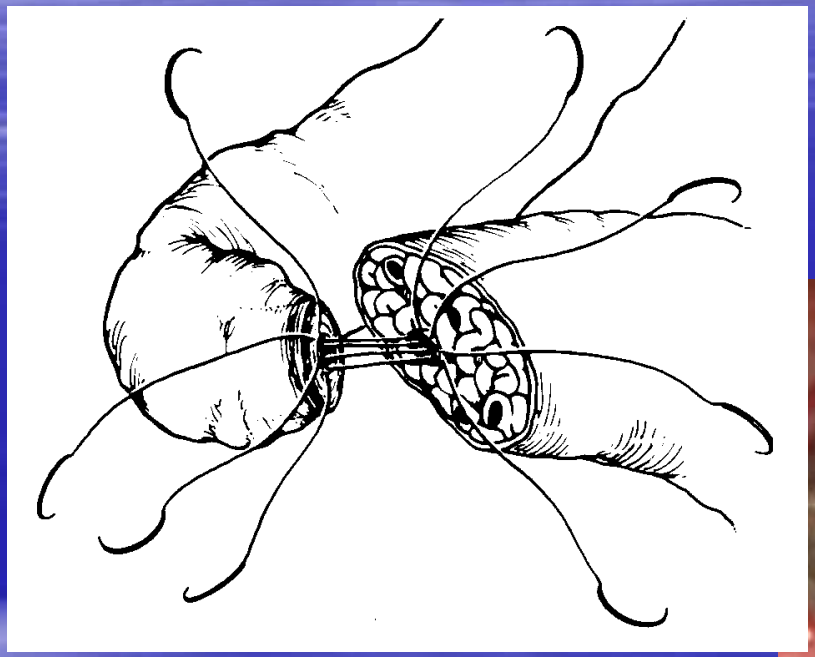
Termino-terminal



Transecting the epididymis

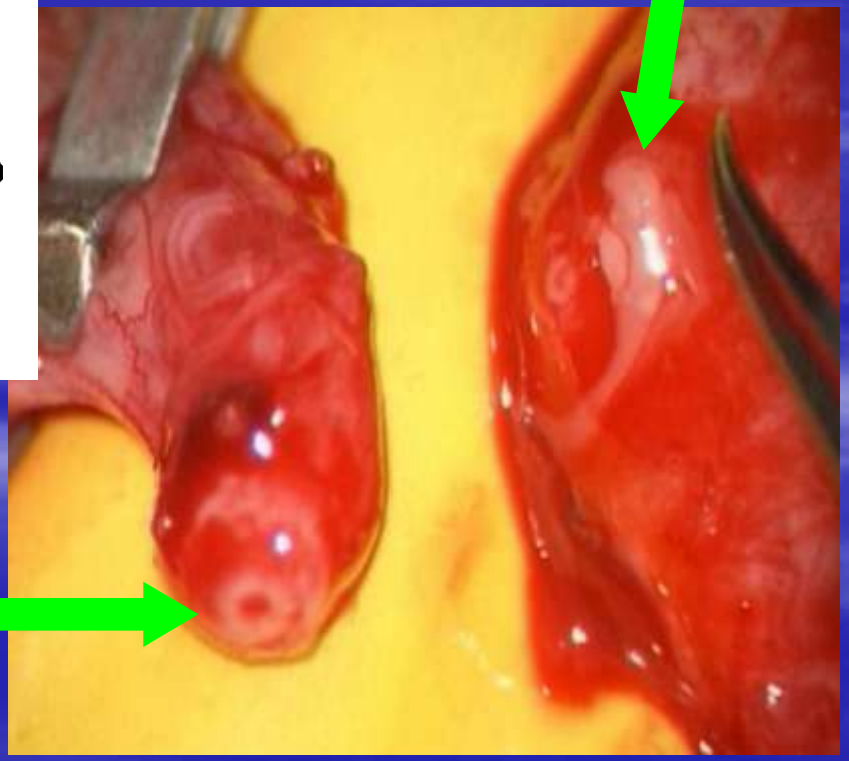


Termino-terminal

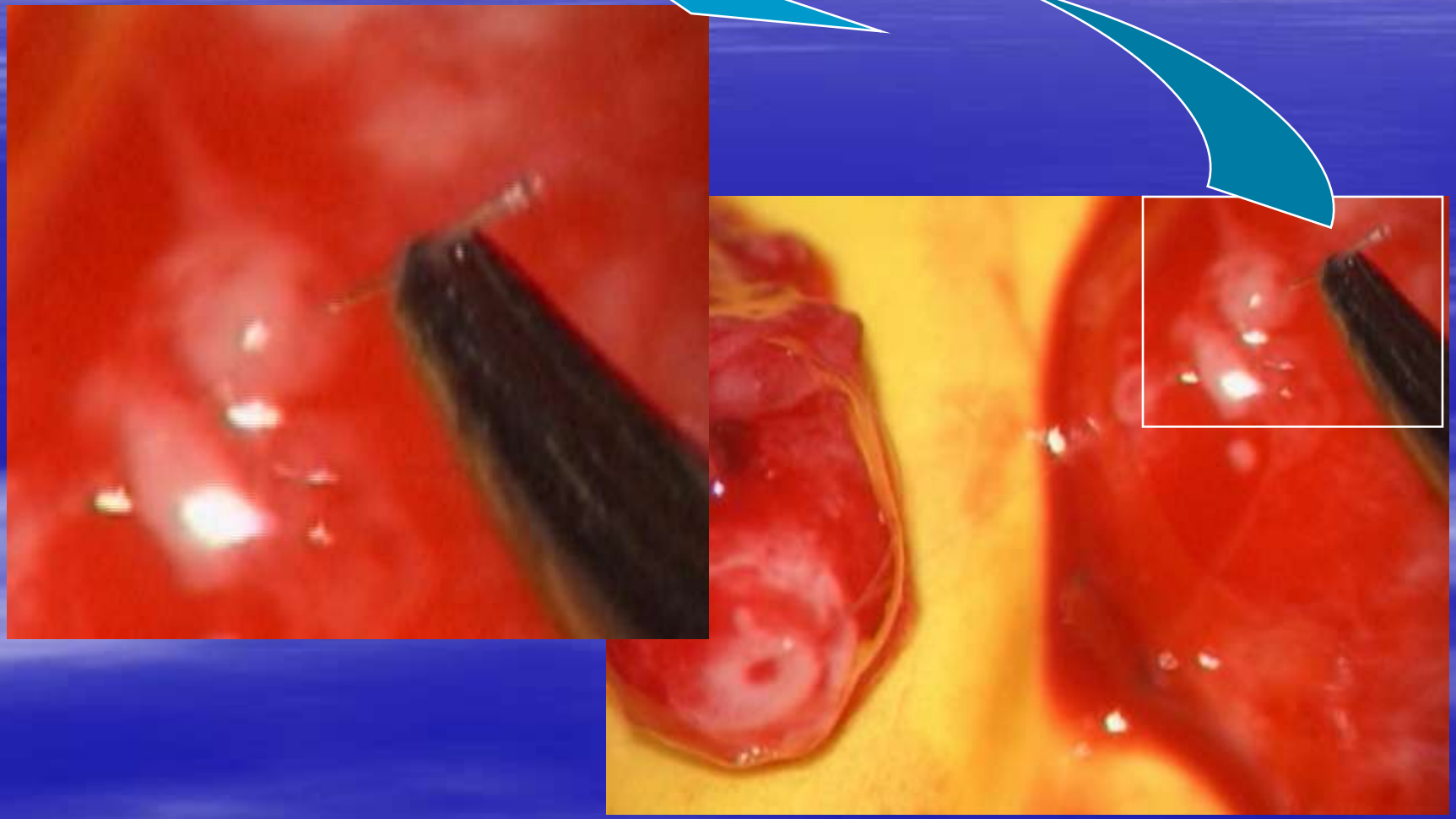


Spermatic fluid

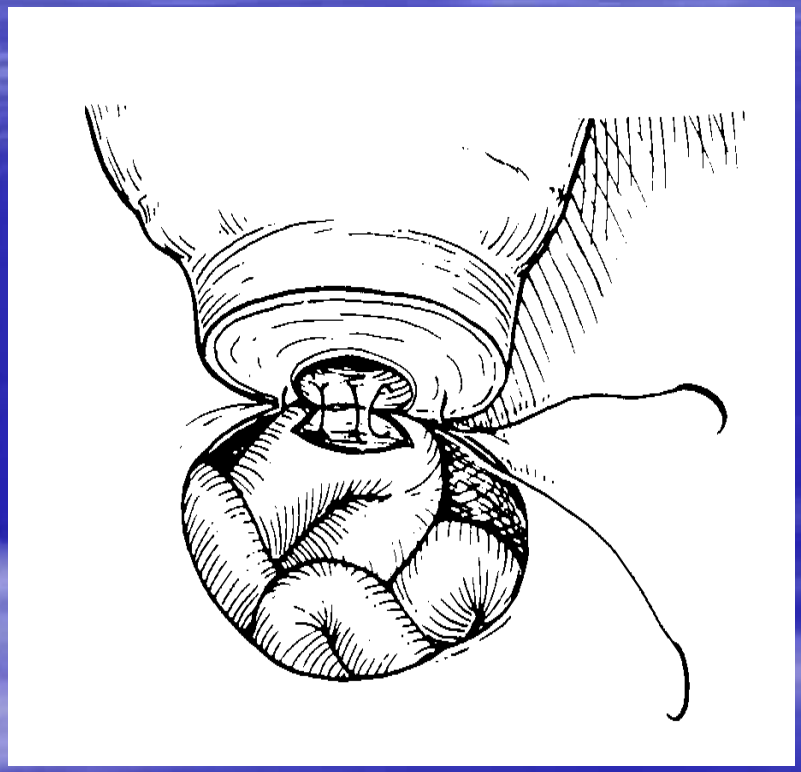
vas

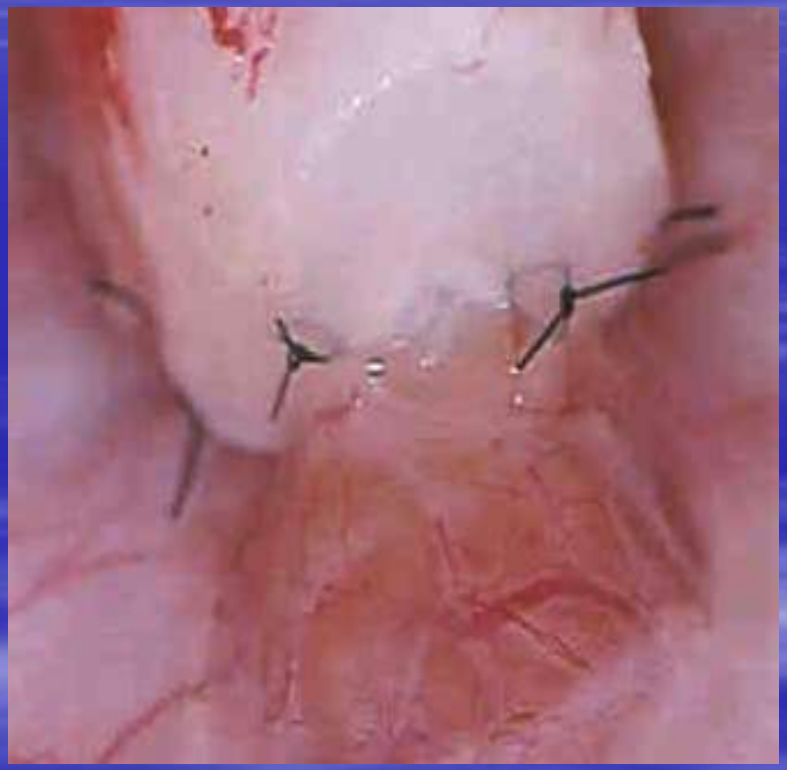


Termino-terminal

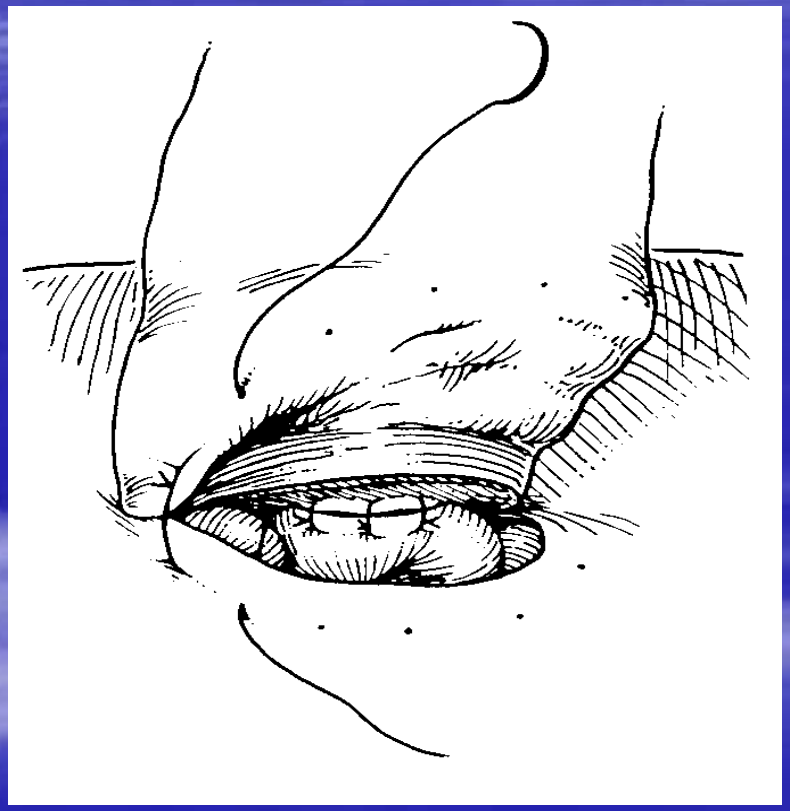


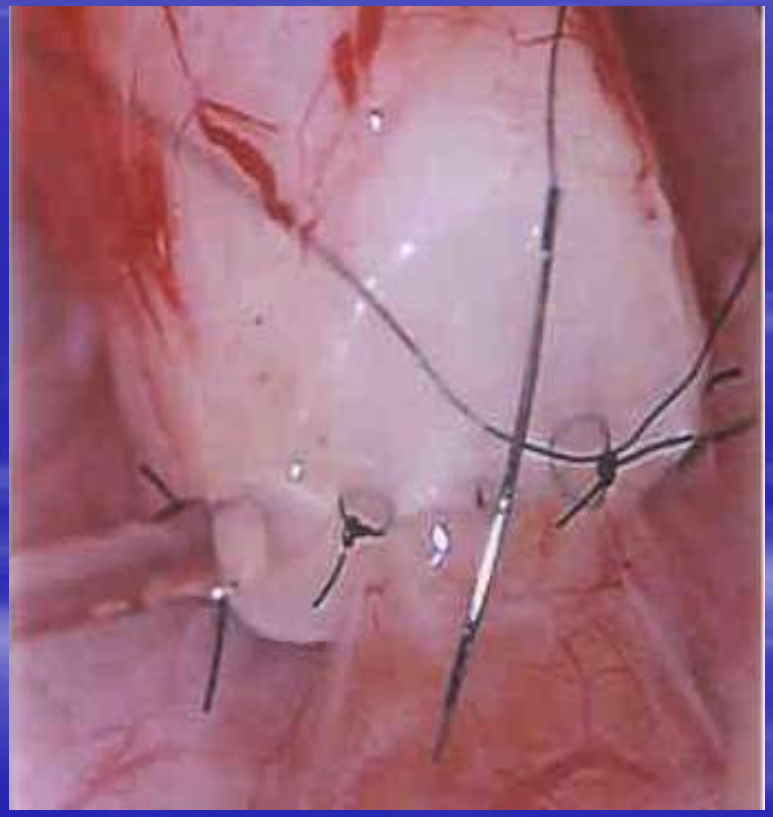
Latero-terminal





Latero-terminal





Vaso-epididymostomy
Results

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

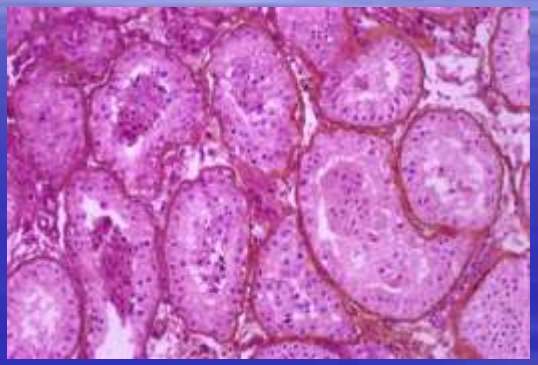
Epididymal sperm aspiration M.E.S.A.

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

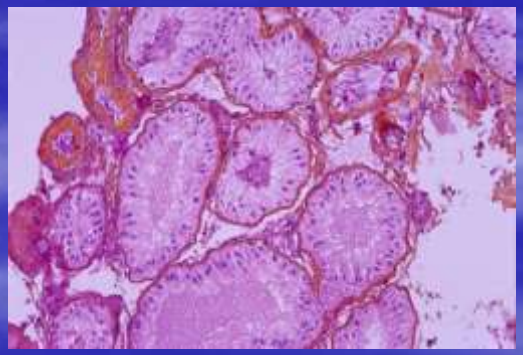
I.C.S.I. with testicular biopsy (TESE)

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

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



normal



s.c.o.

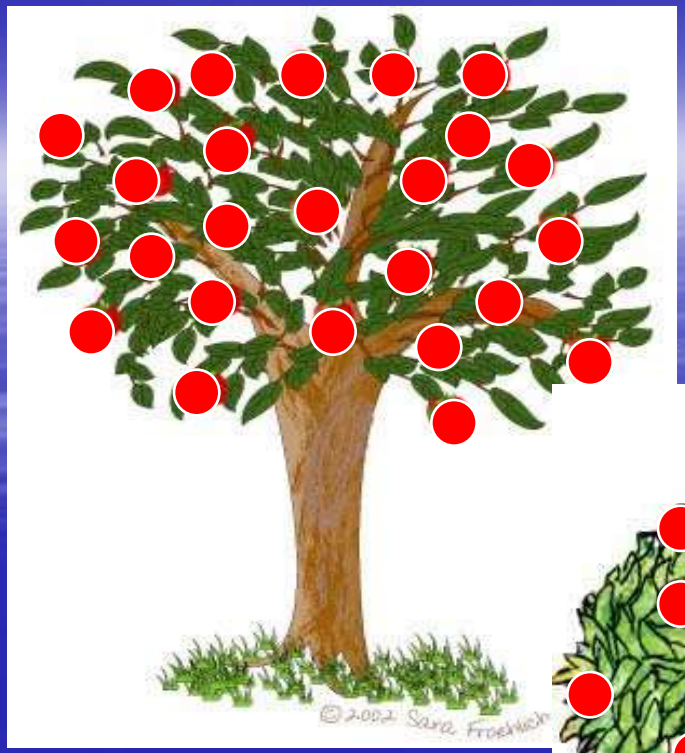
Courtesy Dr H.Lucas

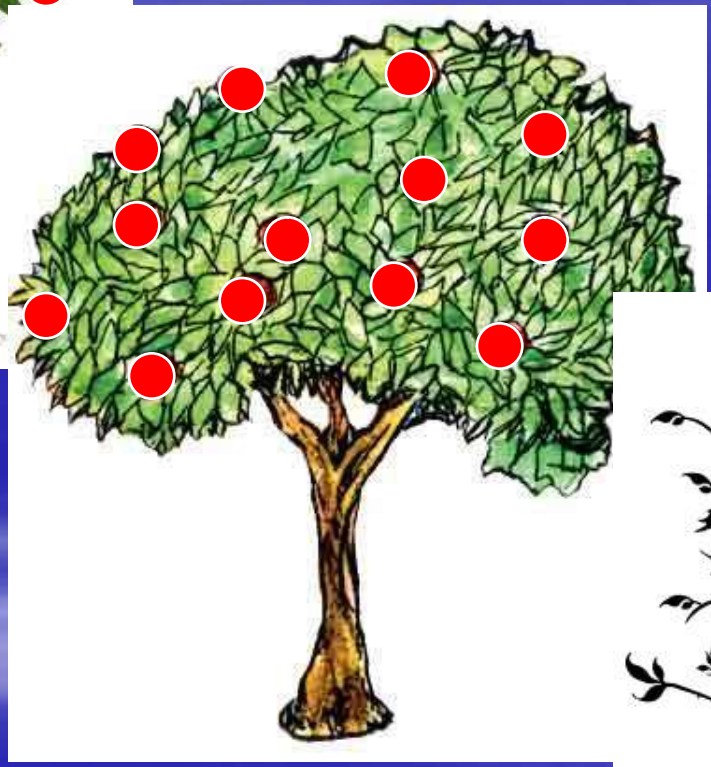
I.C.S.I. with testicular biopsy (TESE)

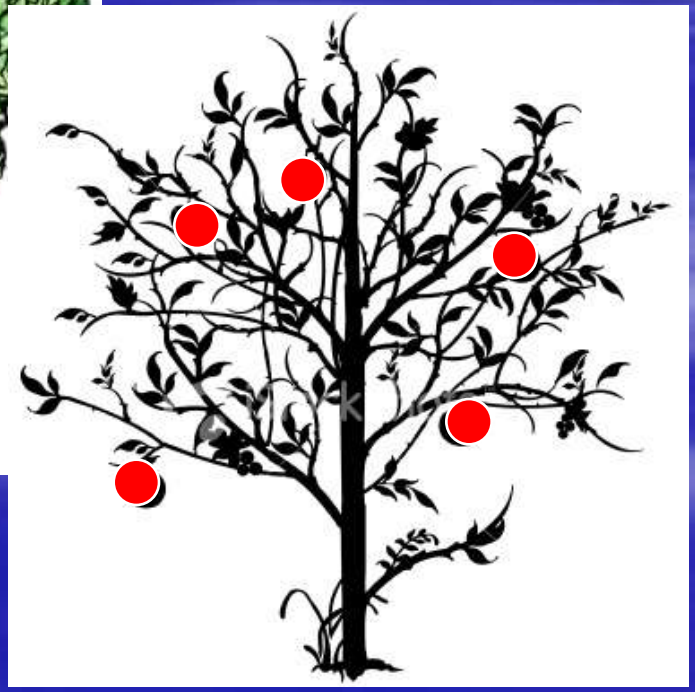
- Picking up of productin zones
- Less testicular tissue needed
- Better results
- Tensionfree running suture (10-0 polyglycolic)
- Local anesthetic at the end of surgery

G.A. de Boccard, 1996

Picking up of production zones like fruits from a tree



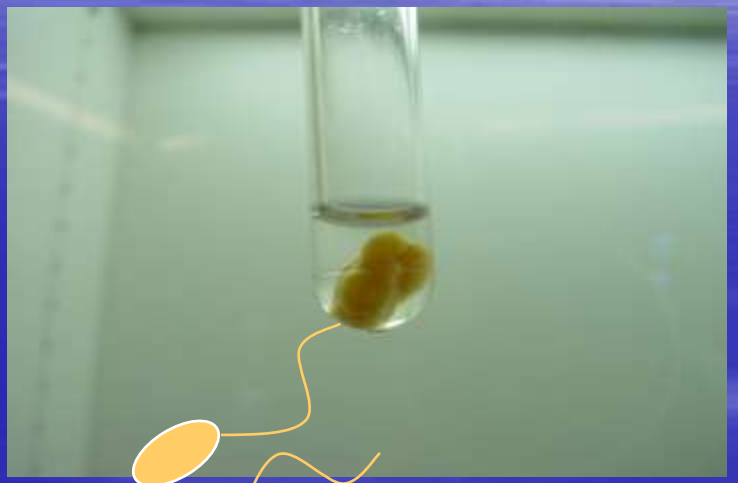




Avoid testicular damage

G.A. de Boccard, 1996

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



frozen

Results of TESE + ICSI

2.2 embryo 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

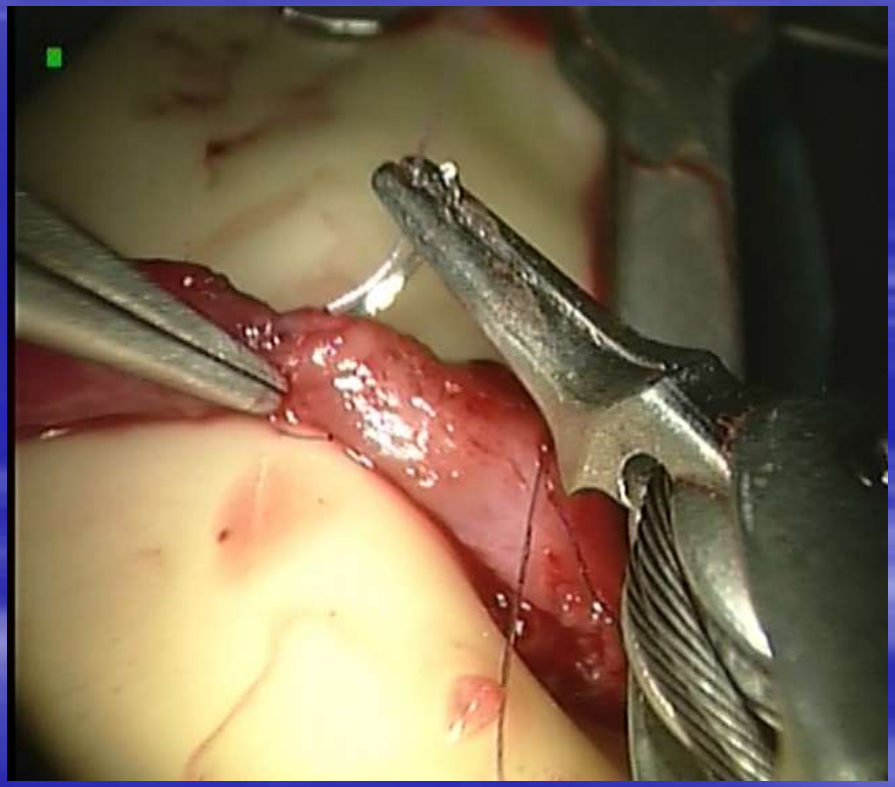
We are improving our ability to treat male causes of infertility in two different ways:

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.)



Thank You