Aspects in the Management of Cryptorchidism in Children

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PAEDIATRIC SURGEON

Introduction

- Undescended testis is the result of a congenital defect in the regulatory or anatomic process of testicular descend.
- Classification:
  - Palpable 80%
  - Non-palpable 20%

Incidence

- 3% of all term male infants
- Birth weight < 2.5 kg: 33 – 45%
  - Majority descend in first 3 months after birth
  - Descend after one year unlikely
- Unilateral cryptorchidism twice as common as bilateral
- Right side affected more than left: 70% versus 30%
- 14% family history

Why operate?

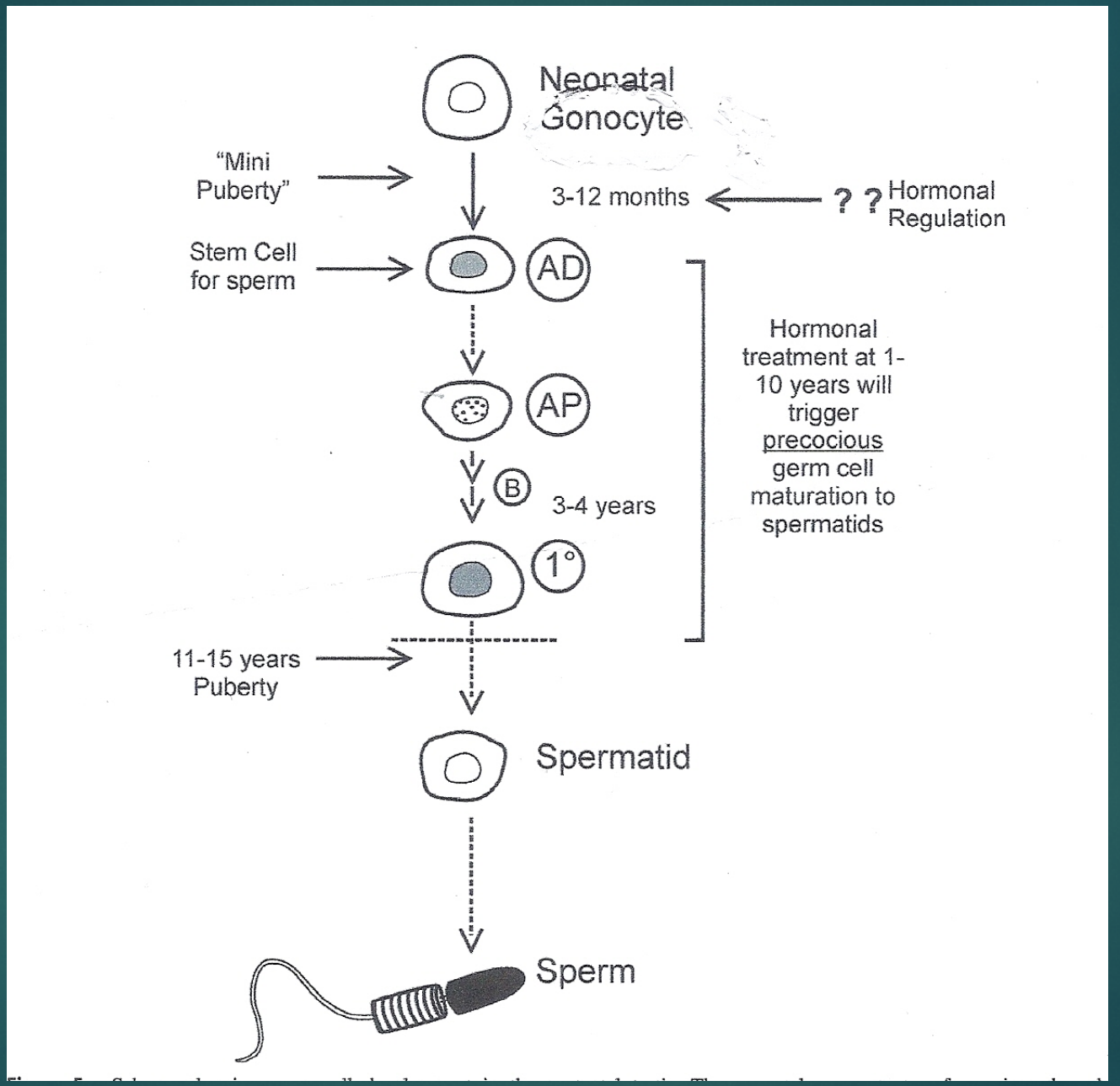
- Fertility
- Malignancy
- Inguinal hernia
- Risk of torsion
- Psychological factors

When to operate

- 6 – 12 months

Fertility

- Beyond 12 months light and electron microscopy – histological changes in germ cell population.
- Failure of gonocyte transformation to A.D. spermatogonia at 6 months. This stage is important to establish a pool of stem cells for spermatogenesis.


Neonatal Gonocyte
"Mini Puberty"
3-12 months
? ? Hormonal Regulation
Stem Cell for sperm
AD
AP
B
3-4 years
1°
Hormonal treatment at 1-10 years will trigger precocious germ cell maturation to spermatids
11-15 years Puberty
Spermatid
Sperm

Malignancy

- 2 to 8 times increased risk in malignancy. Still only 1 in 2 000 men with cryptorchidism history.
- In abdominal testis – seminomas; in orchiopexy – germ cell tumours.
- 15 – 20% of testicular tumours in the normal contralateral testis.
- Orchiopexy facilitate subsequent testicular examination
- Carcinoma in situ: similar enzymatic markers as neonatal gonocytes (neonatal gonocytes fail to transform into spermatogonia and increase in temperature also prevents apoptosis)
- Reason for surgery at 6 months.

Anomalies associated with Undescended Testis

- Prune belly syndrome
- Gastroschisis
- Bladder extrophy
- Myelomeningocele
- Posterior urethral valves

Retractile Testis

- Diagnosis:
  - Testis can be brought into the scrotum
  - Remains there for a period
  - Normal size
- 25% ascend and become undescended testis:
  - Failure of the spermatic cord elongation
  - Persistent fibrous remnant of processus vaginalis
  - Tethering of ectopic gubernaculum
- Annual follow-up until post puberty: if undescended – orchiopexy at diagnosis

Hormonal Treatment - Human Chorionic Gonadotrophin (hCG) and Luteinizing Hormone-Releasing Hormone (LHRH)

- Effective in only 10 – 20% of patients
- Hormonal treatment triggers precocious germ cell maturation (↓infertility).
- Twenty % of successfully treated testes reascend again. (Follow-up important).
- Contra indicated in newborns, ectopic testis and prune belly syndrome.
- Possible complications include frequent erections, scrotal pigmentation, weight gain, aggressive behaviour and premature closure of epiphyseal plate.

Bilateral Undescended Testis

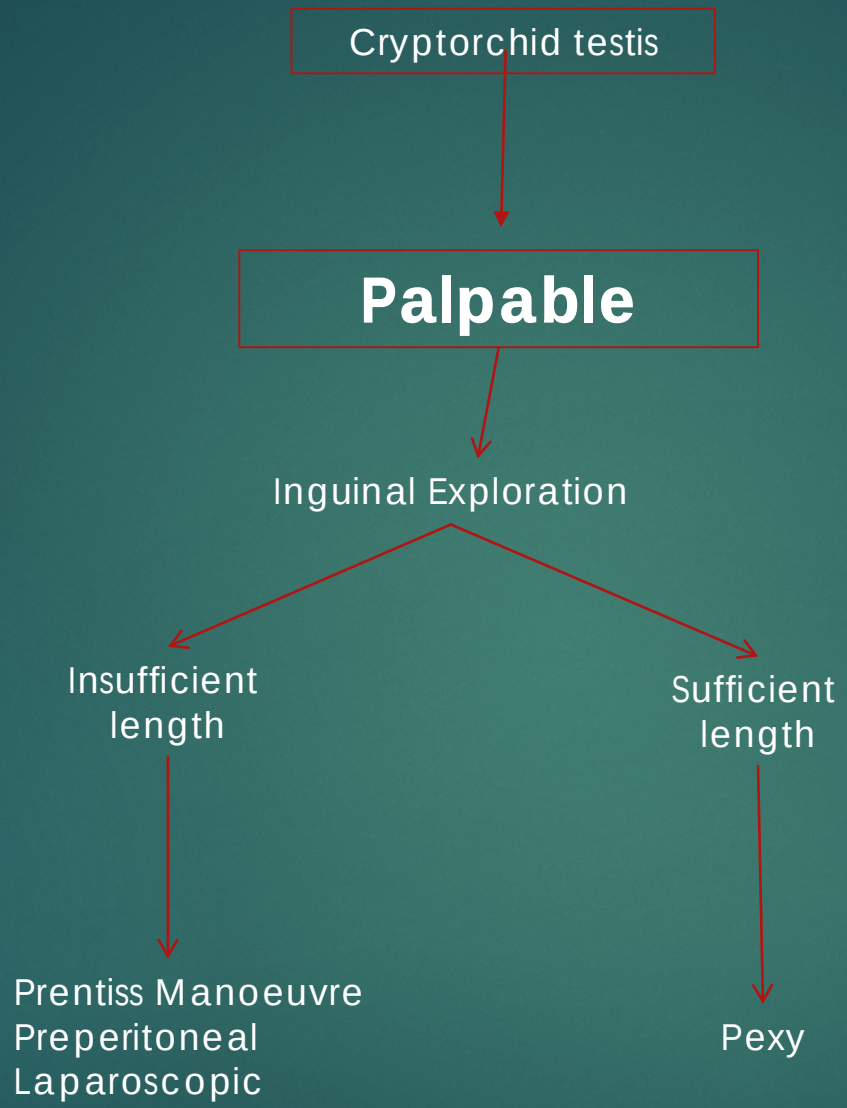
- Exclude disorders of sexual differentiation (30% of patients).
- Hormonal evaluation to establish if testicular tissue is present or not.
- Anorchia:
  - Serum testosterone ↓
  - FSH and LH ↑
  - AMH (anti mullerian hormone) ↓
  - Negative hCG stimulation test


A
B

Special Investigations

- Radiological imaging is seldom helpful
- Bilateral undescended testis: MRI with gadolinium might be useful.

Surgical Management

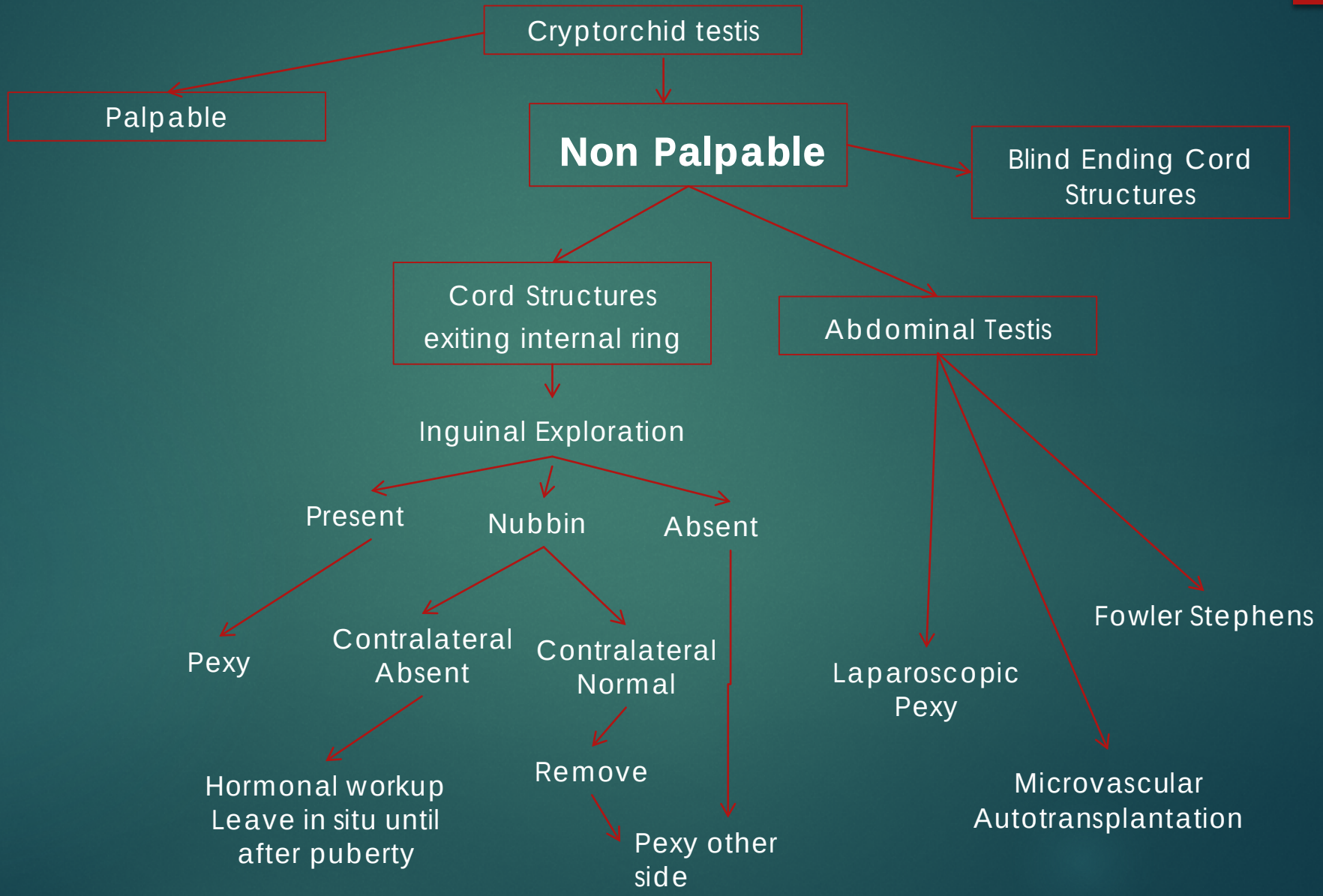

Cryptorchid testis
Palpable
Inguinal Exploration
Insufficient length
Sufficient length
Prentiss Manoeuvre
Preperitoneal
Laparoscopic
Pexy

Palpable Testis

- Inguinal orchiopexy
  - Transvers inguinal incision
  - Dissection to external ring
  - Canal open lateral
  - Gubernaculum transected
  - Cord structures mobilised off sack
  - Hernia sack tied off
  - Upward traction on the sack
  - Cord structures can be mobilised into retroperitoneum
  - Transverse skin incision in scrotum
  - Dissection of subdartos pouch
  - Testis delivered into pouch
  - Pexy: closure of neck of pouch versus pexy of tunica vaginalis to dartos

- Inguinal orchiopexy insufficient length
  - Prentiss manoeuvre
  - Preperitoneal approach
  - Laparoscopy

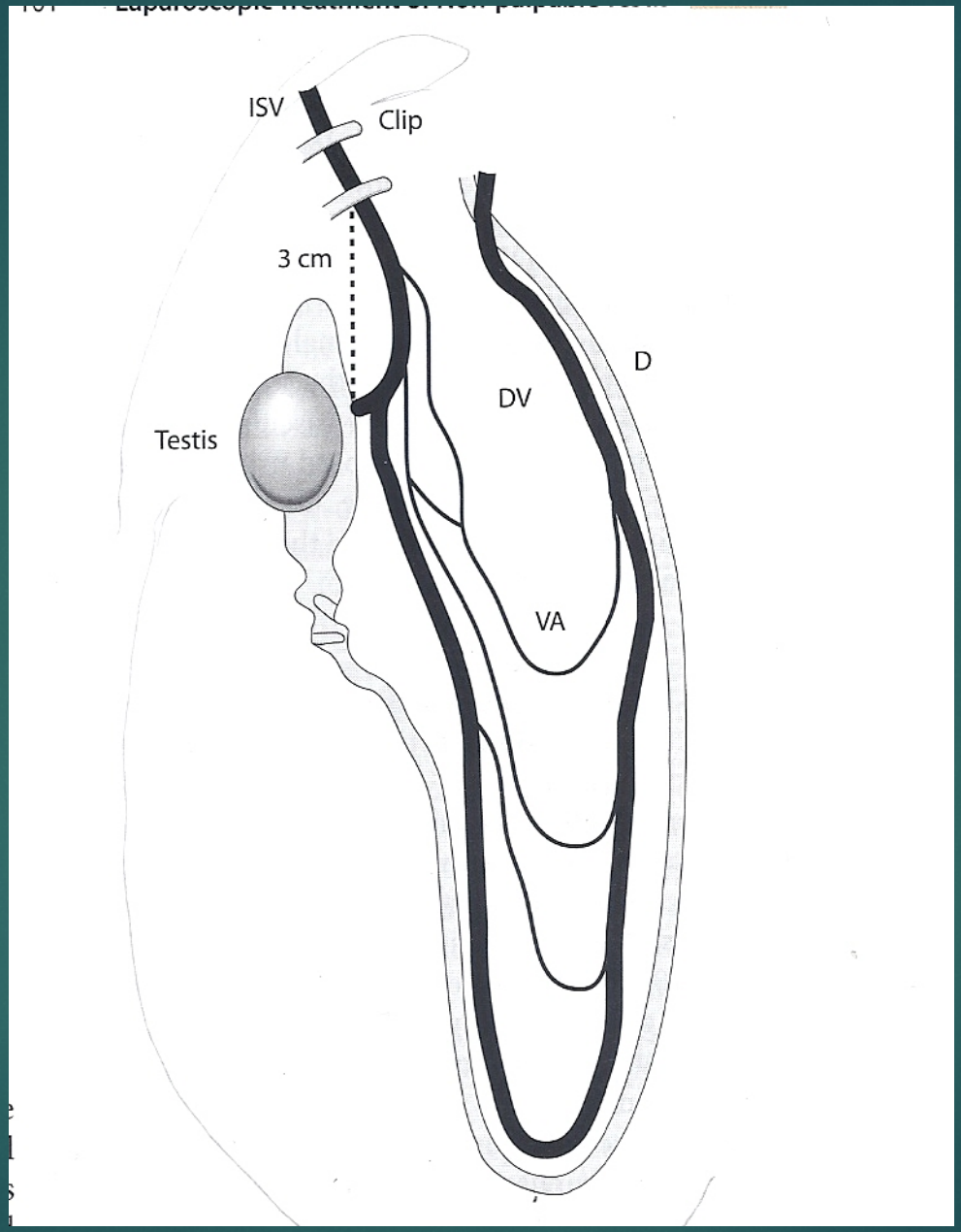
Surgical Planning

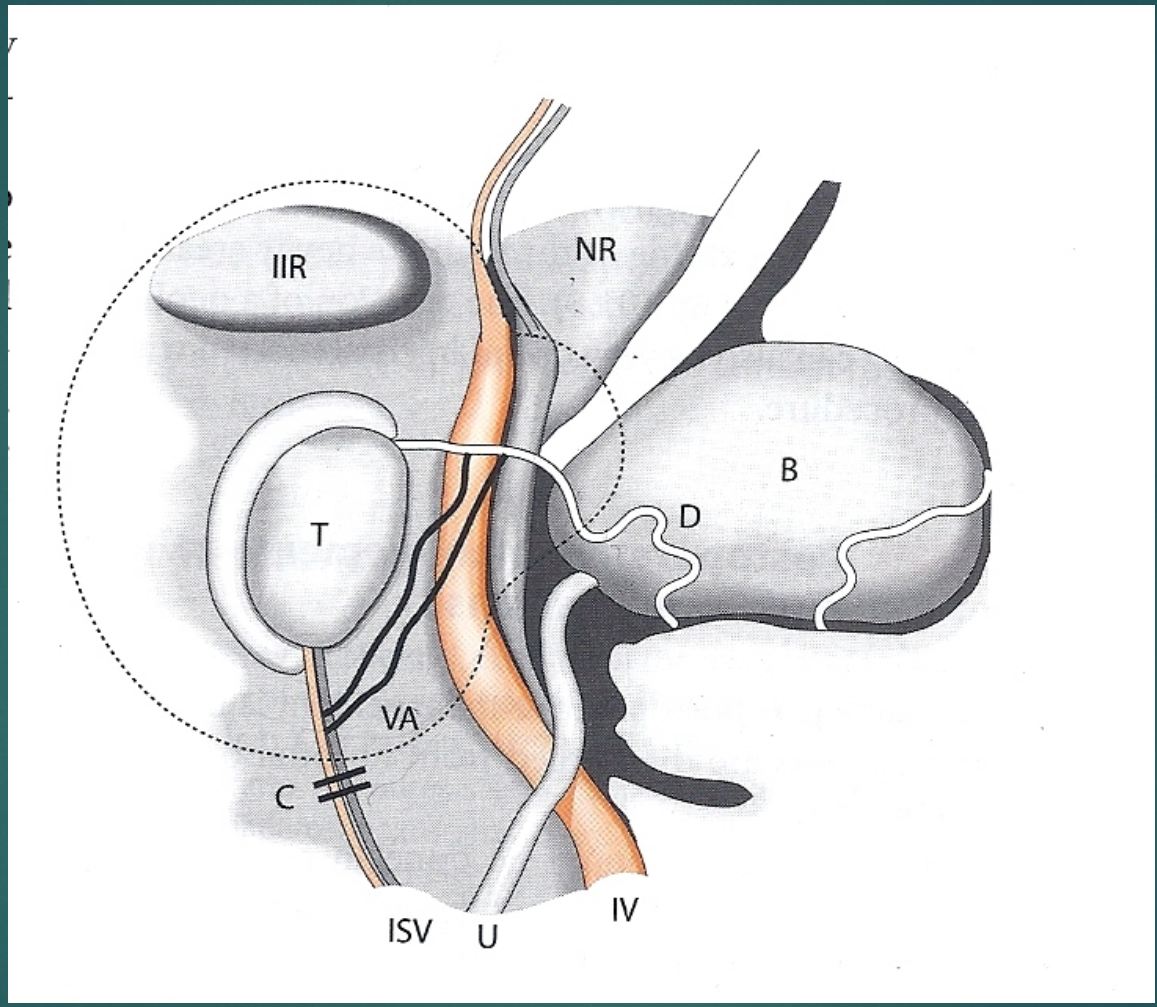


Non Palpable Testis

- Diagnostic laparoscopy:
  - Blood vessels end blindly
  - Blood vessels enter inguinal canal
  - Visible intra abdominal testis is identified

- Laparoscopy
  - Blind ending vessels – no further exploration. ? Pexy opposite side.
  - Vessels transversing through open or closed internal ring – inguinal exploration.
  - Normal testis < 2cm from internal ring – primary laparoscopic orchiopexy without division of blood vessels.
  - Testis >2cm from internal ring – division of spermatic vessels as a single stage or two stage Fowler – Stephens orchiopexy.
  - Very high testis – microvascular outotransplantation.
  - Abnormal testis (nubbin) – remove.


ISV
Clip
3 cm
Testis
DV
D
VA


IIR
NR
B
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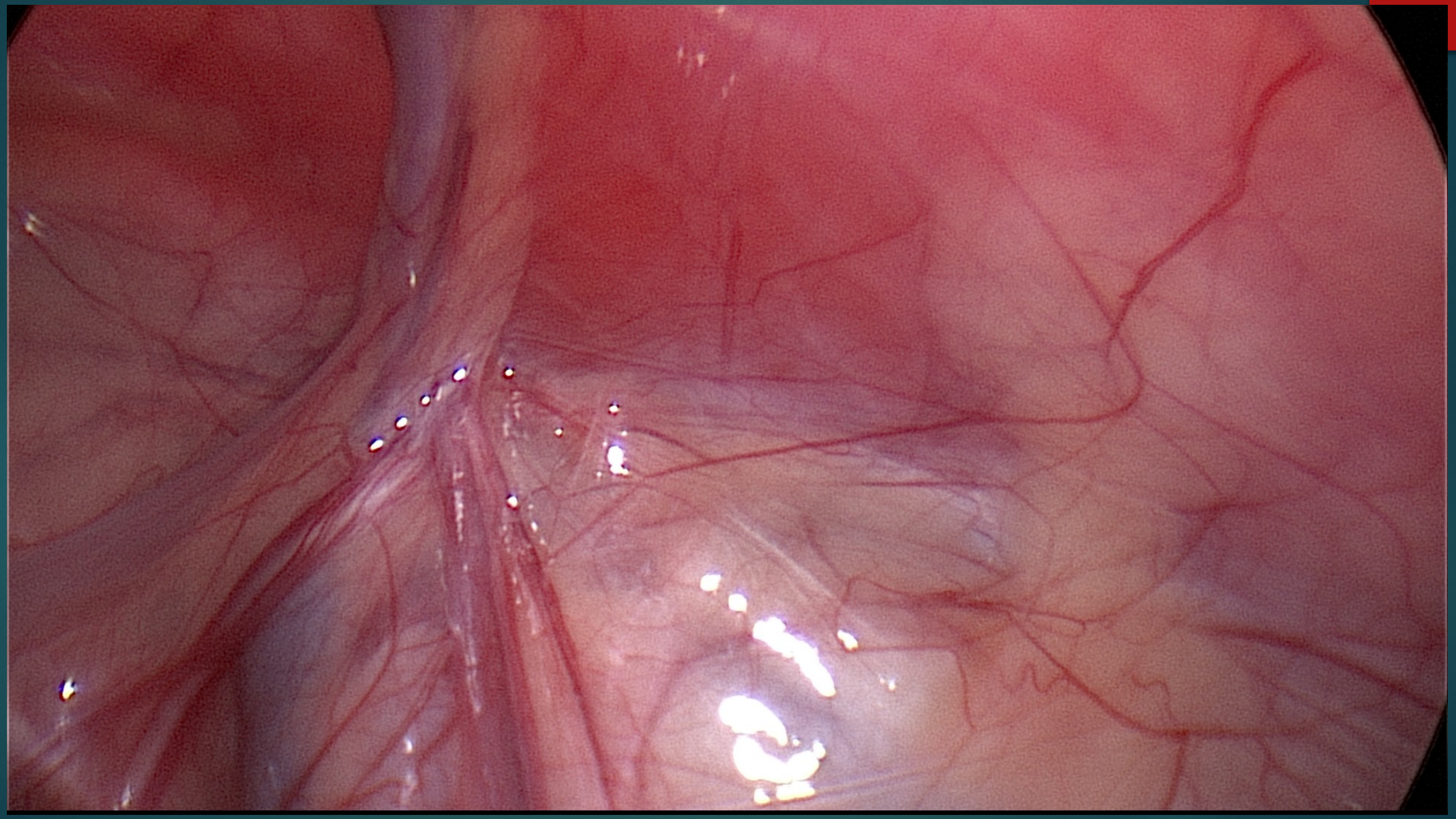
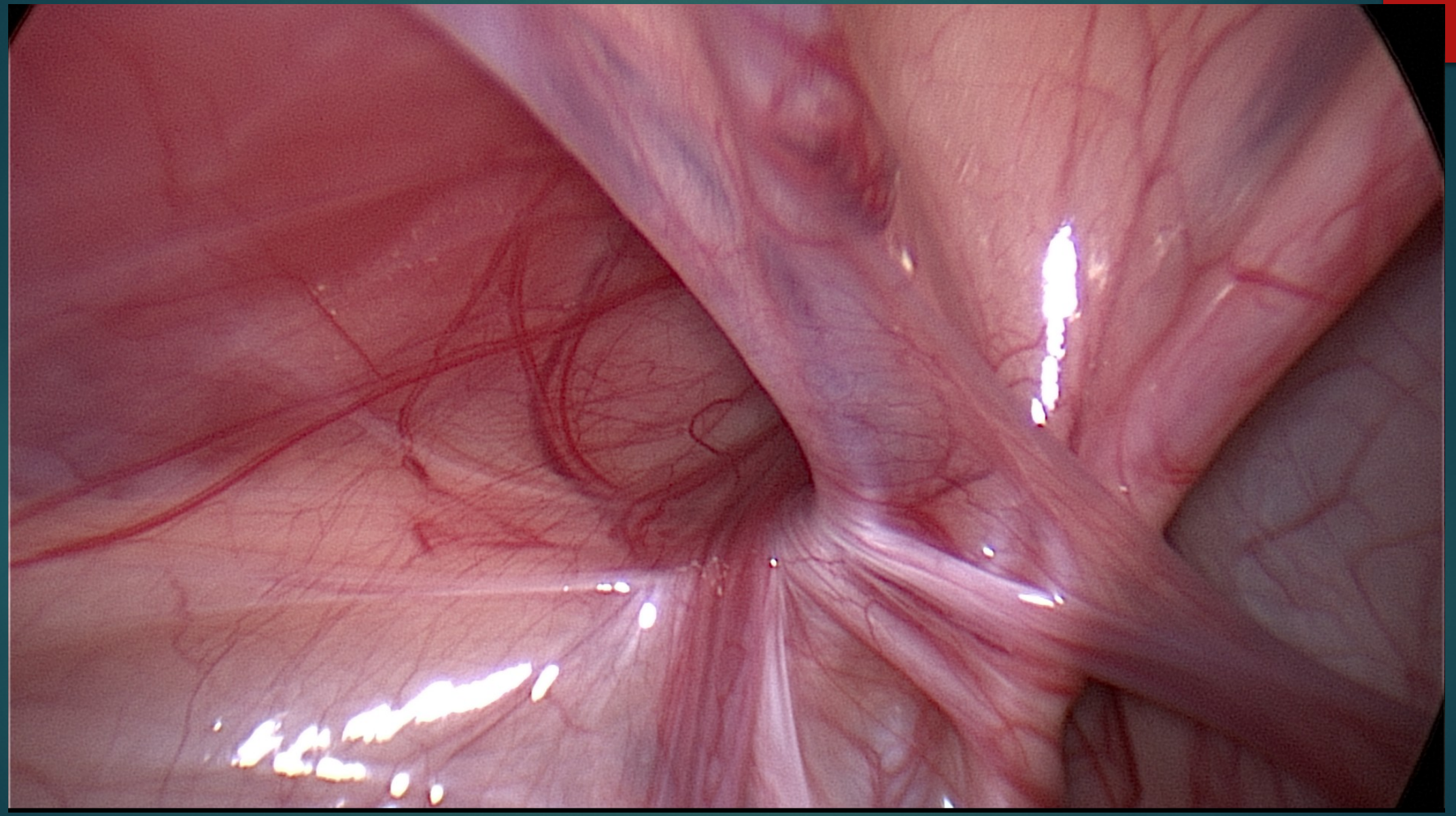
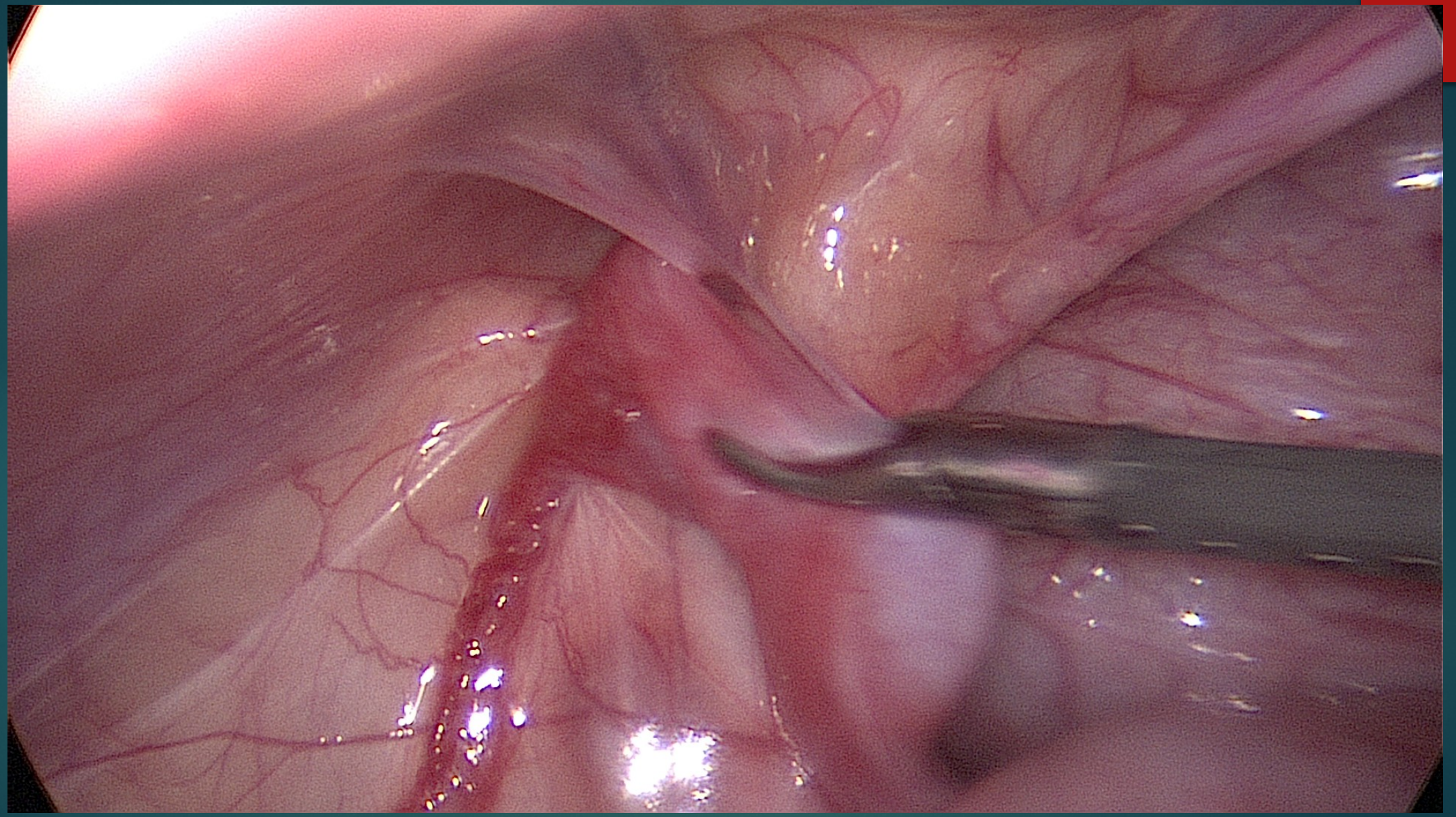
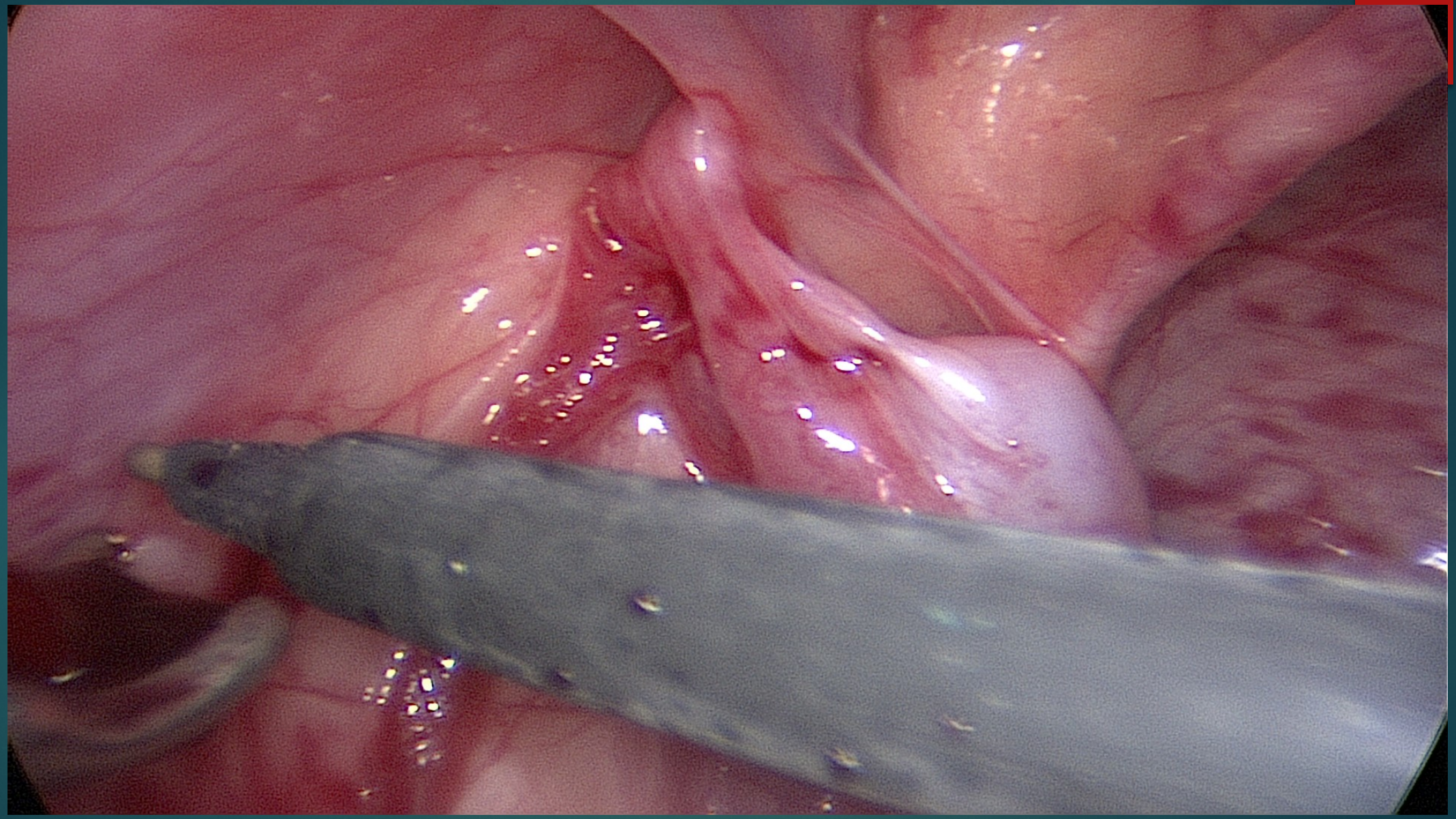
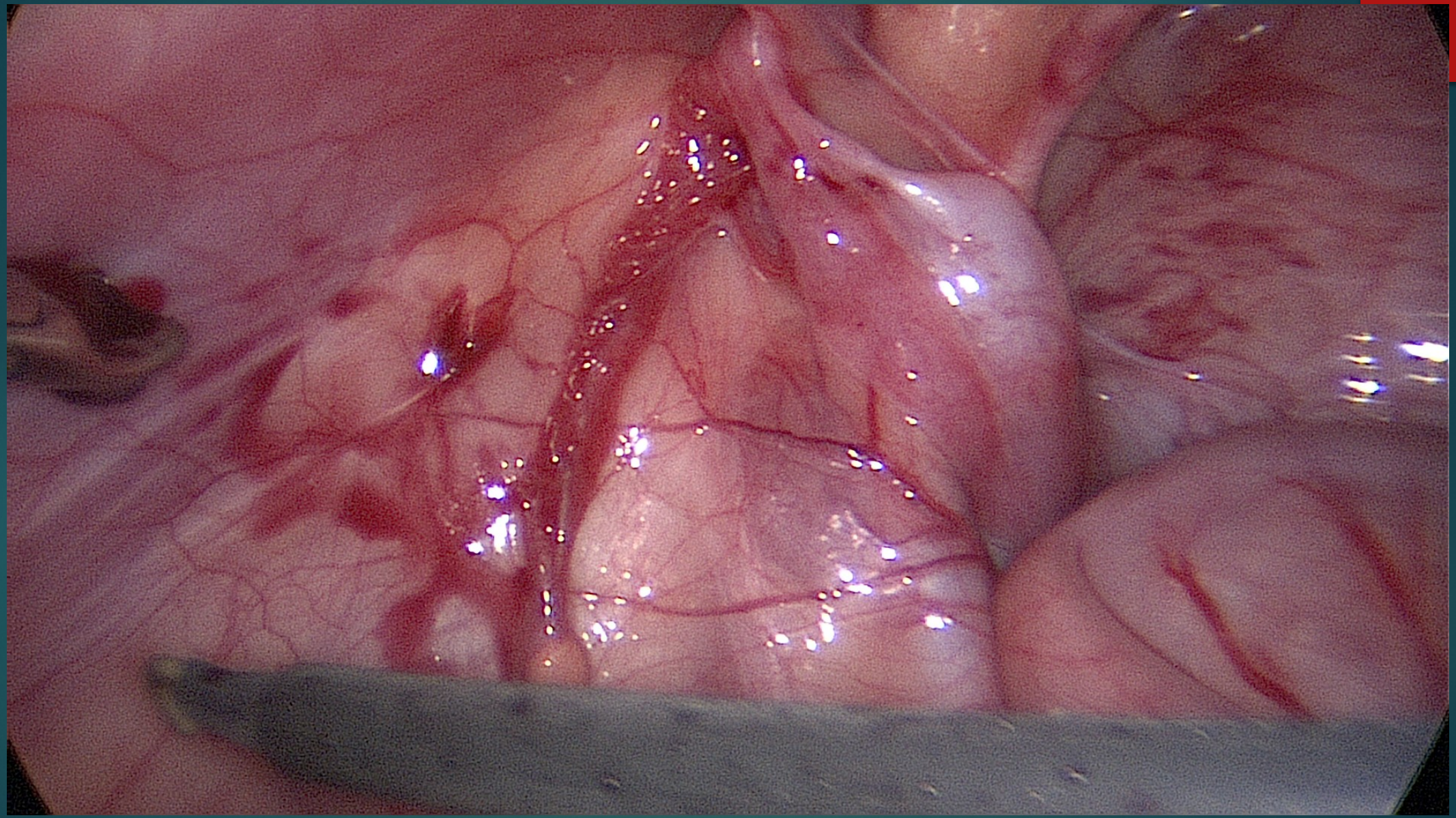
T
VA
C
ISV
U
IV

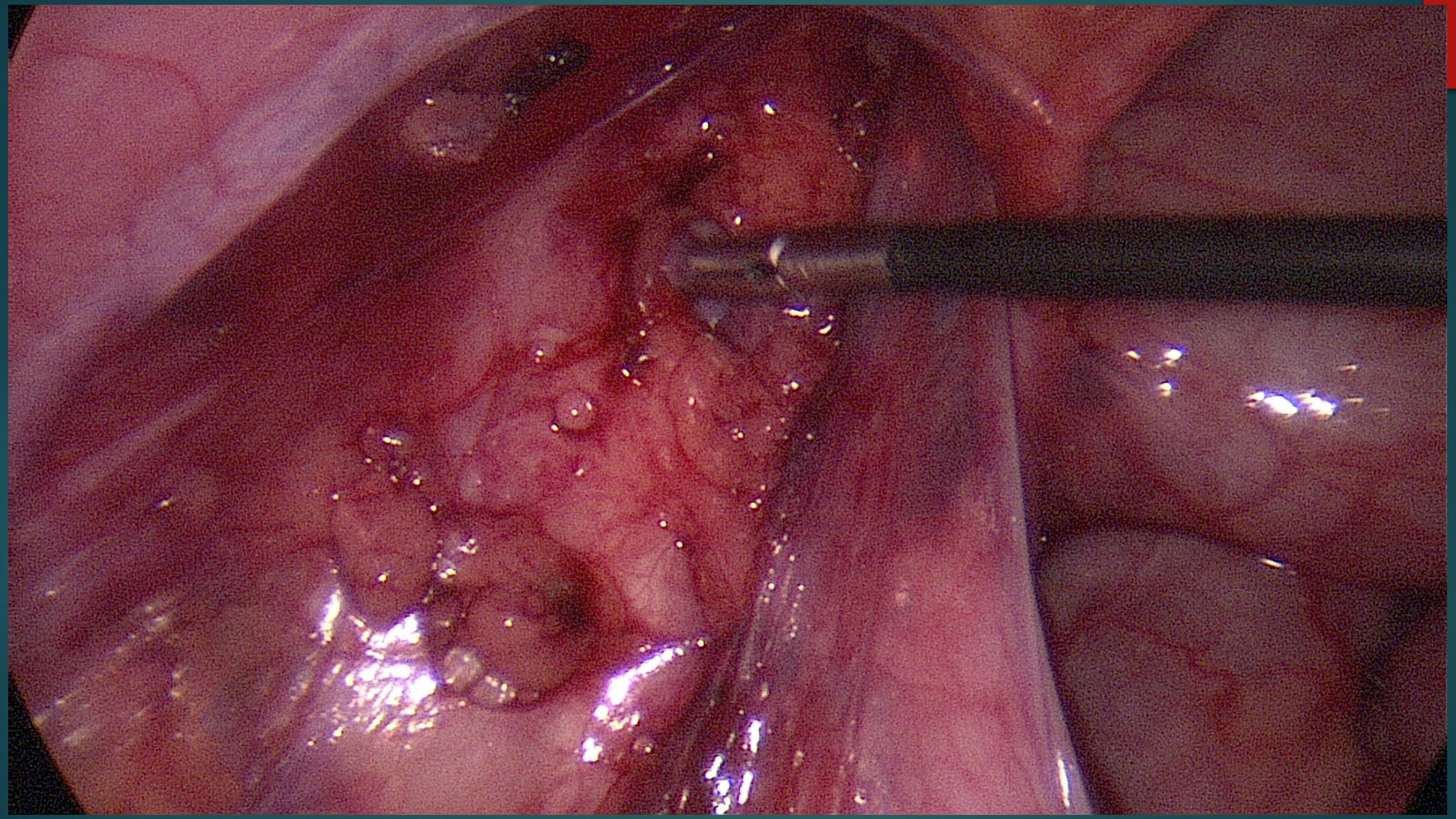












When is Orchidectomy an Option?

- Prepubertal high intra abdominal testis that can not be brought down, with a normal contralateral testis.

Results

Type of surgery	Success rate
Inguinal orchiopexy	88%
Laparoscopic abdominal testis	81%
Two stage Fowler-Stephens	78%
Microvascular anastomosis	80%