



# VARICOCELE

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## **Definition:**

**Ectatic and tortuous veins of the pampiniform plexus of the spermatic cord are found in approximately 15% of male adolescents, with a marked left-sided predominance**

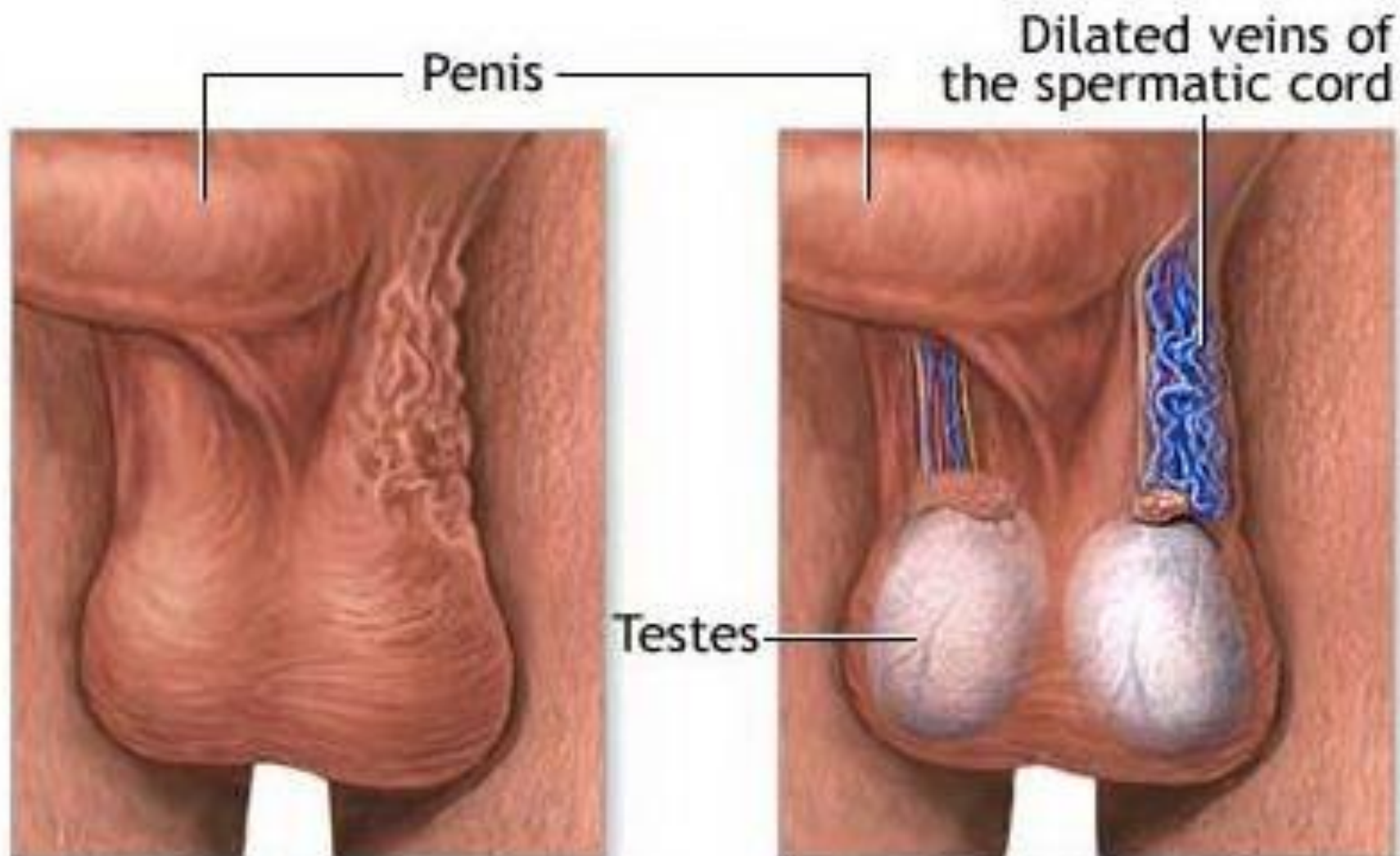


## **Incidence:**

**( Skoog et al, 1997 ) have estimated the incidence between 10 and 17 years of age to be 9% to 25.8%, with an incidence in adulthood of approximately 15%.**

**The prevalence of varicoceles in men presenting with infertility is 20% to 40%**





Penis

Dilated veins of  
the spermatic cord

Testes

A varicocele can be felt and sometimes be seen as a tortuous mass on the surface of the scrotum

A varicocele is made up of veins that contain inadequate valves

## *PATHOPHYSIOLOGY*

- Approximately 90% of varicoceles are left sided.
- Bilateral varicoceles are palpable in less than 2% of males
- There are three primary factors:
  1. increased venous pressure in the left renal vein.
  2. collateral venous anastomoses.
  3. incompetent valves of the internal spermatic vein.

- The pathophysiology of adolescent varicocele may be multifactorial**
- The normal physiologic changes that occur during puberty and result in increased testicular blood flow might expose underlying venous anomalies to overperfusion and cause venous ectasia to become clinically evident.**



# **PATHOLOGY OF TESTICULAR DYSFUNCTION**

## **A. Combination of several mechanisms:**

- 1.Reflux of adrenal metabolites.**
- 2.Hyperthermia, increase of 0.78°C**
- 3.Hypoxia.**
- 4.local testicular hormonal imbalance.**
- 5.Intratesticular hyperperfusion injury.**




## **B. The toxic effect of varicocele:**

- 1. testicular growth failure.**
- 2. semen abnormalities.**
- 3. Leydig cell dysfunction(atrophy to hyperplasia).**
- 4. histologic changes (tubular thickening, interstitial fibrosis, decreased spermatogenesis, maturation arrest).**


**Steen (1991) , who documented diminished ipsilateral volume in 34.4% of boys with a grade 2 varicocele and in 81.2% of boys with a grade 3 varicocele.**





- **Leydig cell dysfunction in patients with varicocele may in part be caused by diminished intratesticular testosterone levels.**
  - **Serum levels of FSH, LH, and testosterone are not predictably abnormal.**
  - **Normal peripheral blood levels of these hormones cannot exclude the possibility that Leydig cell dysfunction exists.**
- 

**Castro-Magana and colleagues (1990) found exaggerated LH and FSH levels in adolescents with unilateral varicocele after stimulation with GnRH and testosterone and concluded that normalization of gonadotropin and testosterone responses to GnRH stimulation occurred after varicocele ablation in boys whose testis biopsies demonstrated no histologic abnormalities.**



# *CLINICAL FINDINGS*

- **Asymptomatic**
- **discovered on routine physical examination E.g. school entry, driver's license examination**
- **scrotal mass**
- **Symptoms: inguinal or scrotal aching discomfort, infertility.**



○ common differential diagnoses for generally painless scrotal masses in adolescents.

*1. Inguinal hernia*

*2. communicating hydrocele*

*3. omental hernia*

*4. hydrocele of the cord*

*5. epididymal cyst (spermatocele)*

*6. scrotal hydrocele*



## Varicocele

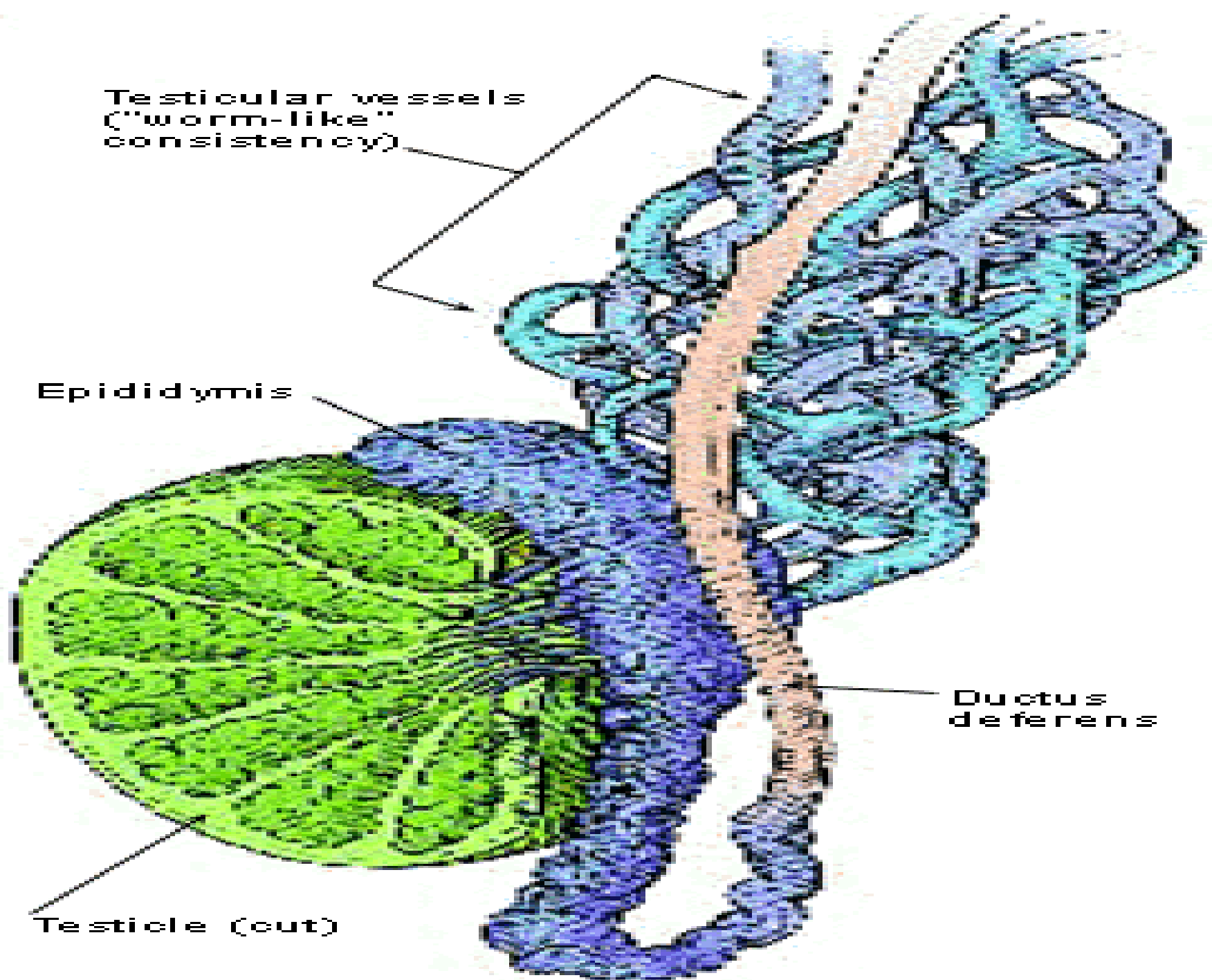


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# PHYSICAL EXAMINATION

- warm room, supine and standing positions and with and without a Valsalva maneuver.
- painless, compressible mass above and in some cases surrounding the testis (bag of worms).
- *There are three grading:*
  1. **Grade 0** – (Subclinical varicocele, Dx by US or venography).
  2. **Grade I** (small, palpable only with a Valsalva maneuver).
  3. **Grade II** (moderately sized, easily palpable without a Valsalva maneuver).
  4. **Grade III** (large, visible through the scrotal skin).

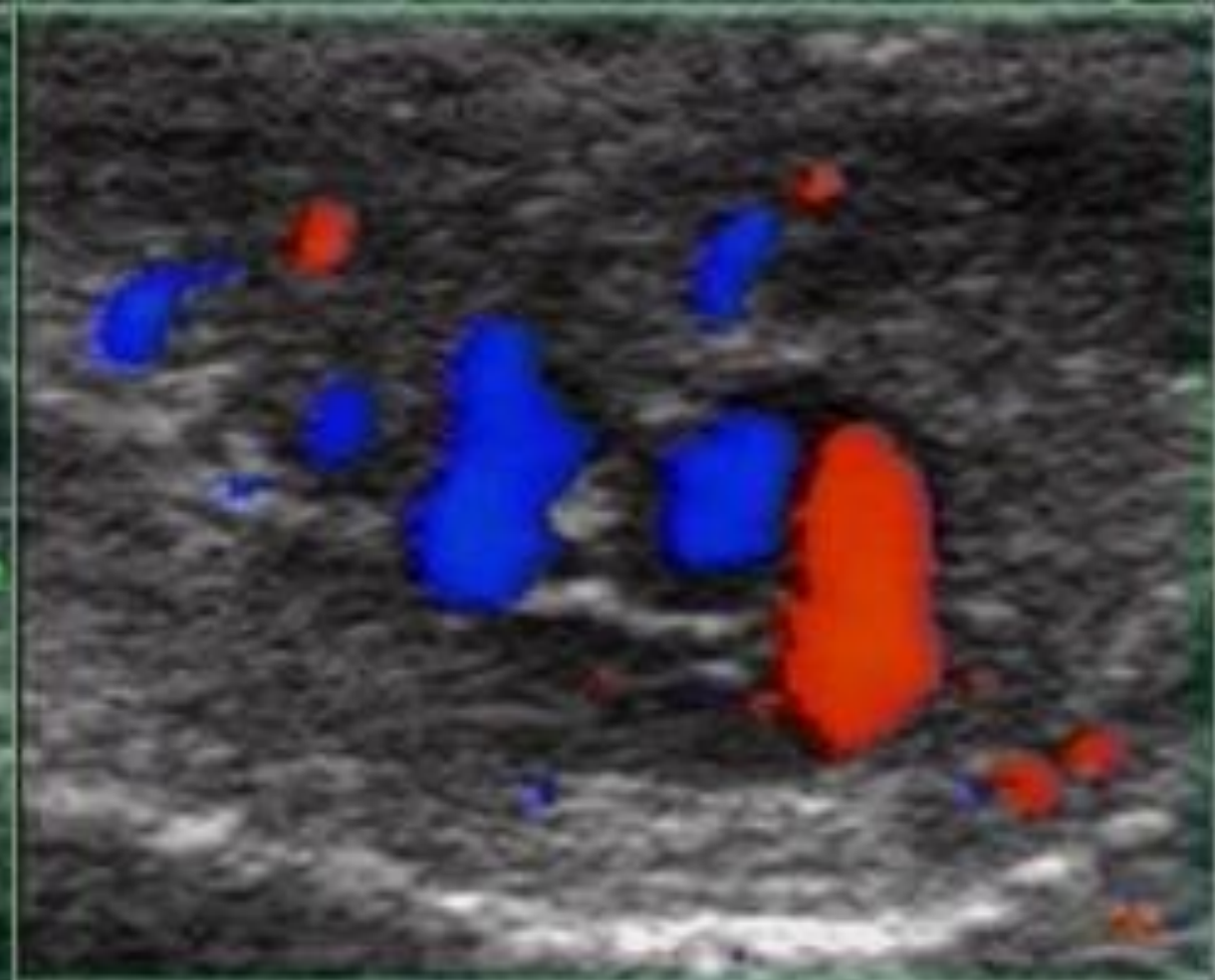


## *ADJUNCTIVE ASSESSMENT*

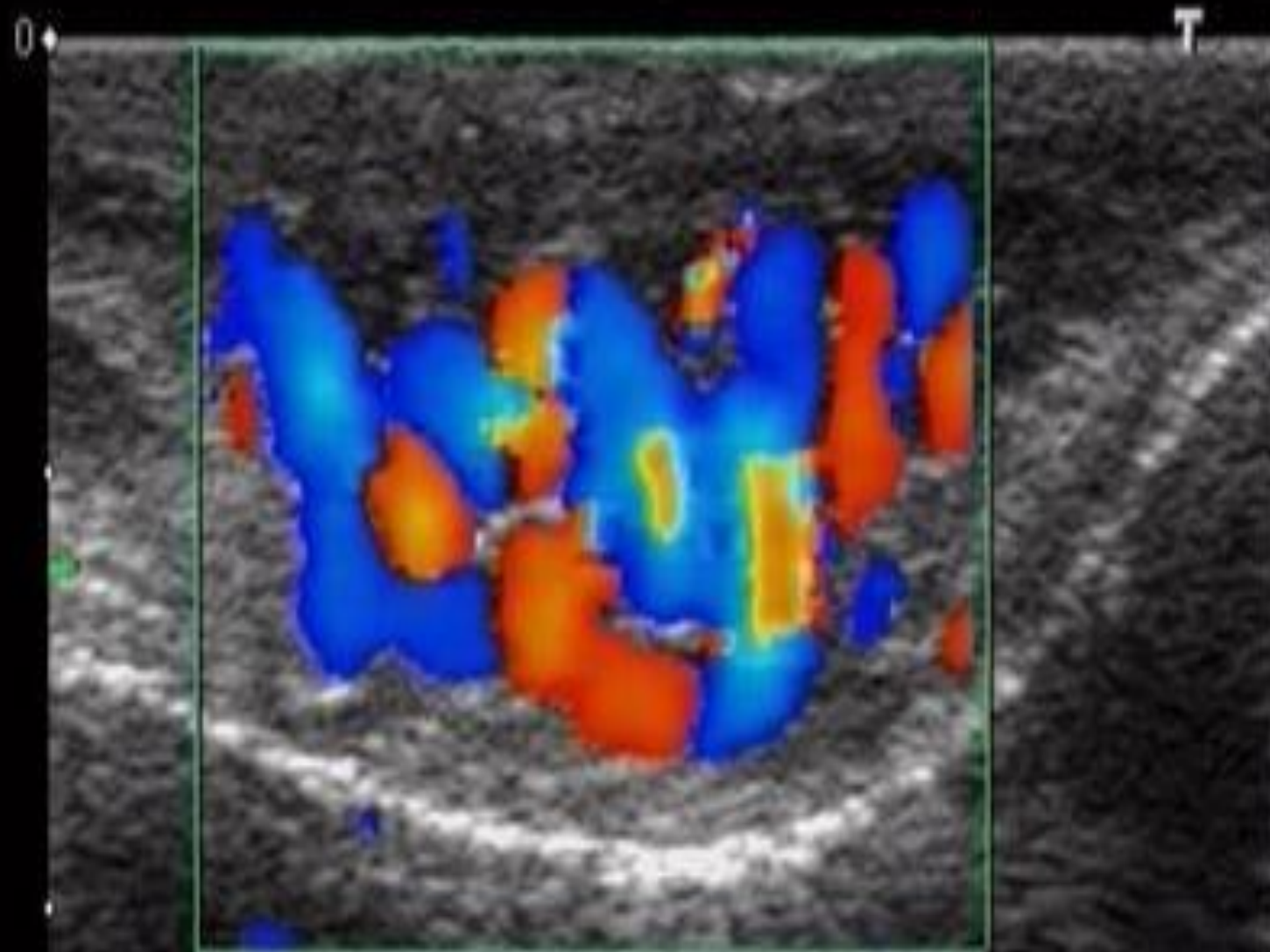
- **Doppler ultrasound**
- **GnRH stimulation**
- **levels of inhibin B**







VARICOCELE LEFT  
AT REST



P100

12L6

9.0

8fps

DR65

2DG

92

CF

4.2

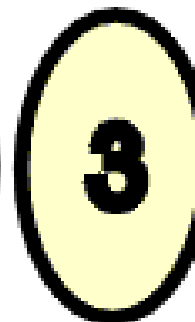
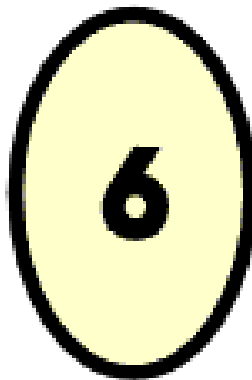
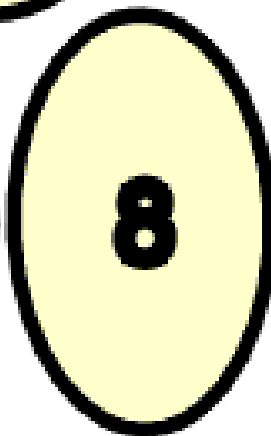
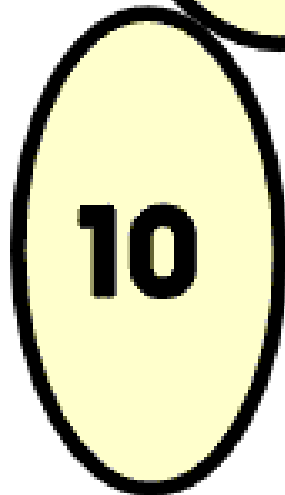
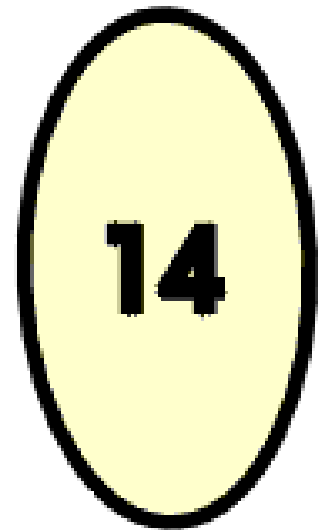
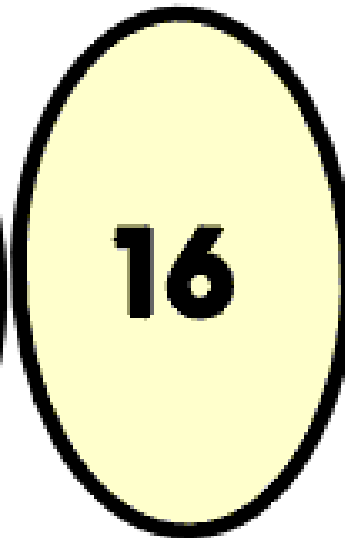
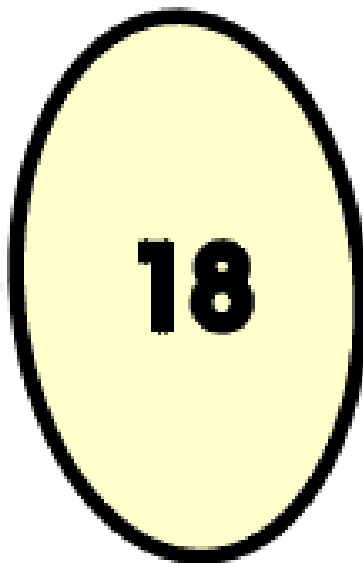
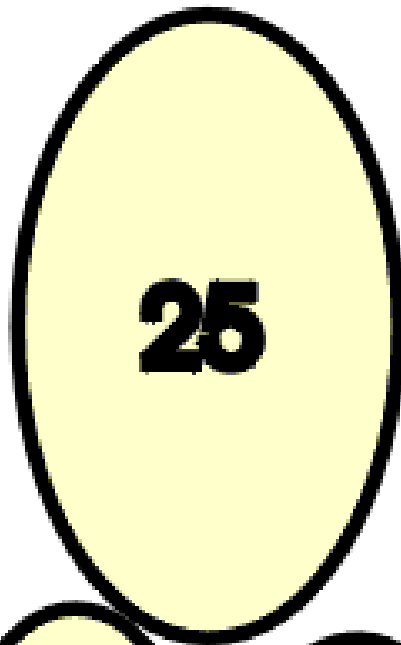
C PRF

5.8k

C III

45

- A crucial part of the physical examination of all boys with varicocele is an accurate assessment of testicular volume and consistency.
- assessment of testicular consistency (firmness) is extremely subjective
- measurement of testis volume can be accurately and reproducibly performed with the use of either a Prader or disk orchidometer
- measurement of testis volume by ultrasound offers little practical advantage and significant expense when compared with orchidometer measurement.



1 Inch

Orchidometer

# *VARICOCELE ABLATION: TREATMENT*

## *CONSIDERATIONS*

- Noxious effect on semen parameters , decreased sperm motility 90% and viability and total sperm counts less than 20 million sperm/mL.
- Testis volume measurements, II or III varicocele and ipsilateral testicular volume loss averaging 70%.



# *TREATMENT*

- Most of the available techniques for varicocele ablation have proved to have very nearly the same efficacy
- it appears that multiple different techniques are applied clinically, with the choice of technique guided by the experience of the surgeon and by taking into account the age, body habitus, and peculiarities of the patient and varicocele in question.



# *SURGICAL APPROACHES*

- **1. Scrotal approach**
- The scrotal approach has now become virtually *obsolete* because of the increased risk of injury to the testicular artery and the high rate of failure related to the complexity of the scrotal pampiniform plexus.





## 2. RETROPERITONEAL APPROACH

- The retroperitoneal approach involves ligation of the internal spermatic vein as it exits the inguinal canal and preservation of the internal spermatic artery.
- A common complication of the retroperitoneal approach is varicocele recurrence or persistence, estimated to be between 11% and 15%





### 3.LAPAROSCOPIC APPROACH

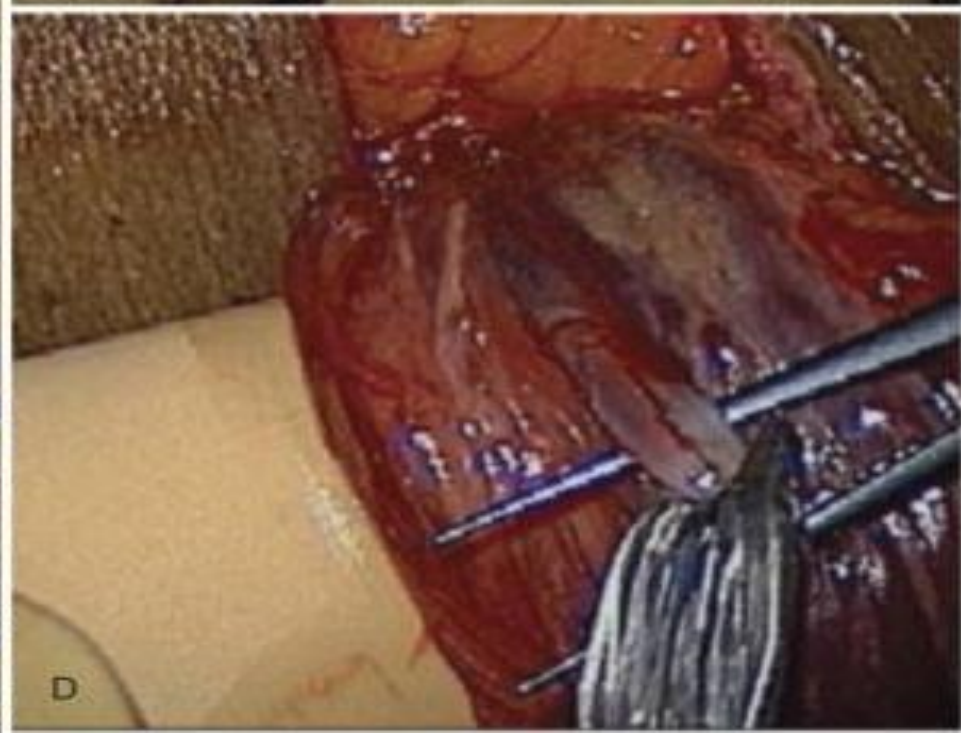
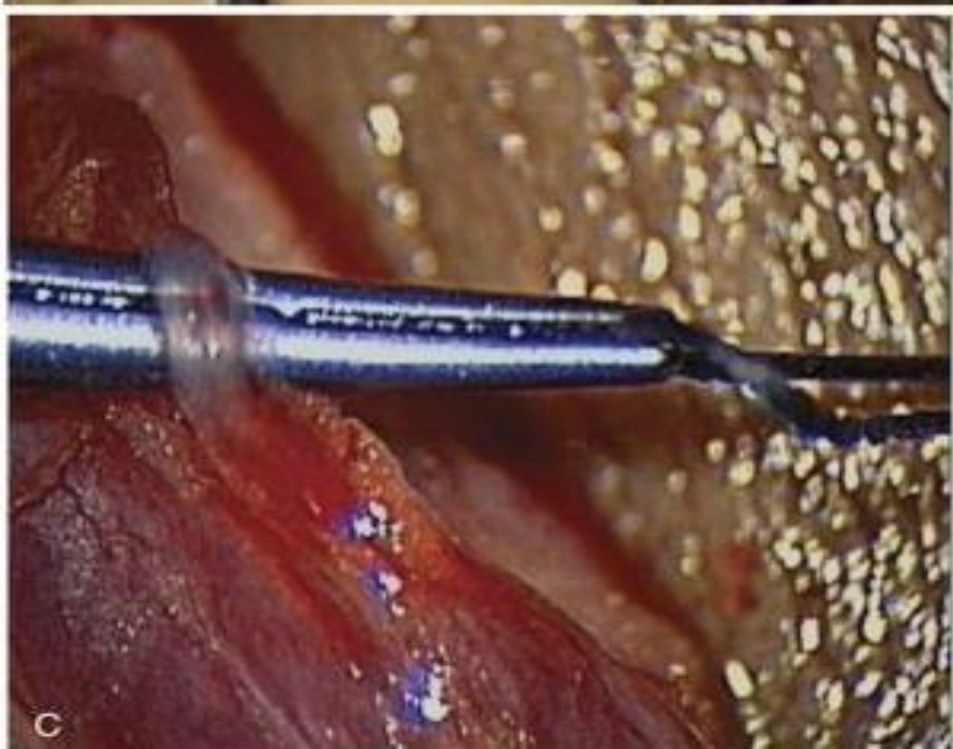
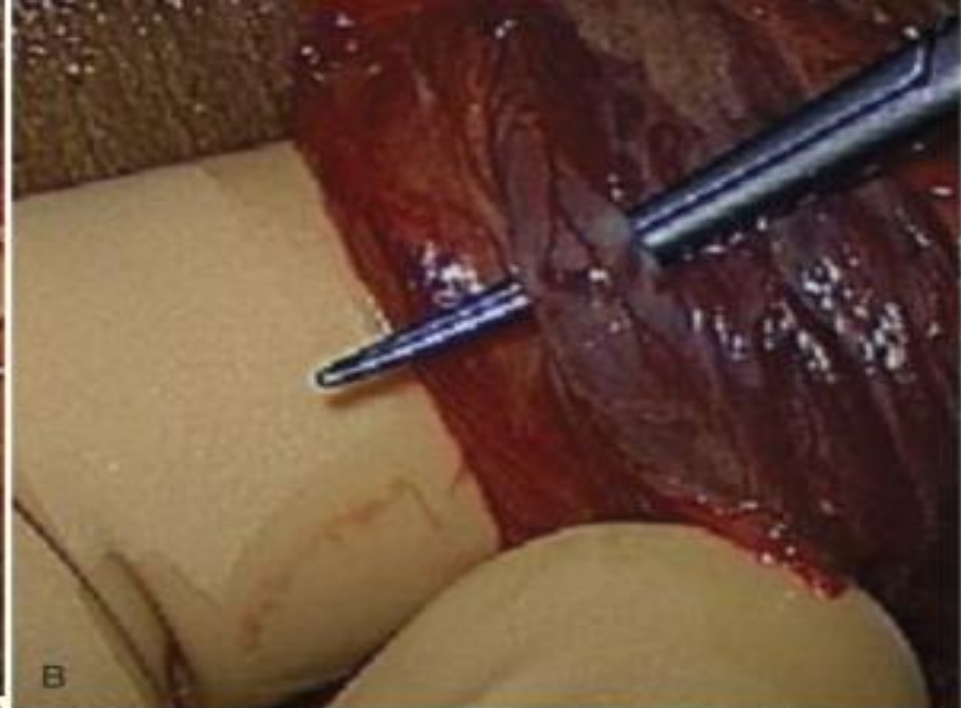
- This type of repair is rarely used to treat varicoceles in adults because it generally involves ligation of the testicular artery, which can lead to testicular atrophy, and it is excessively invasive for what should be a minor outpatient procedure.



## 4.INGUINAL APPROACH (MODIFIED IVANISSEVICH)

- A Doppler probe as well as vasodilators, such as papaverine or lidocaine, may be used to help identify the testicular artery.

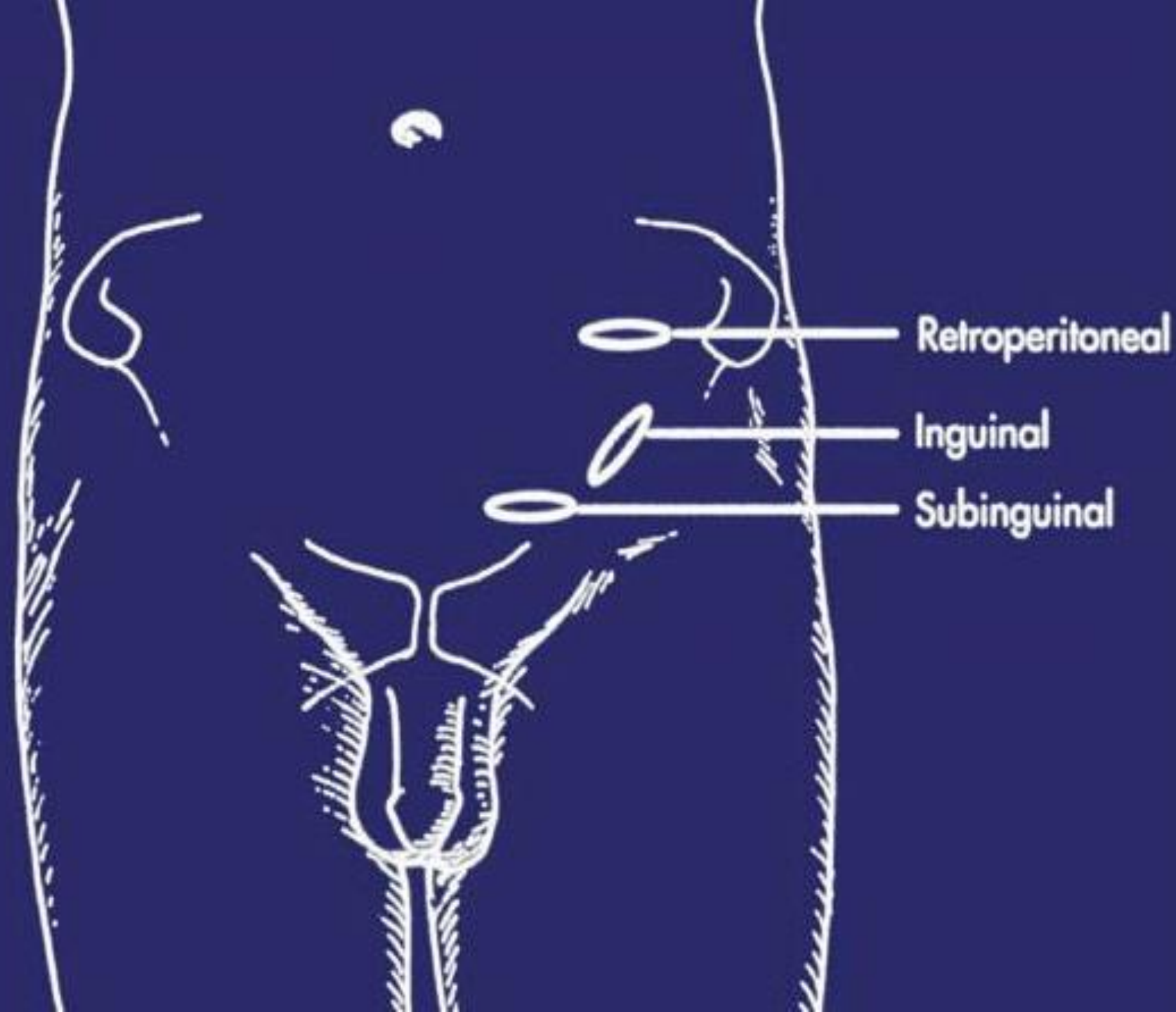




## 5.SUBINGUINAL APPROACH

- **Care must be taken to identify and to ligate any posterior cremasteric veins to prevent varicocele recurrence.**



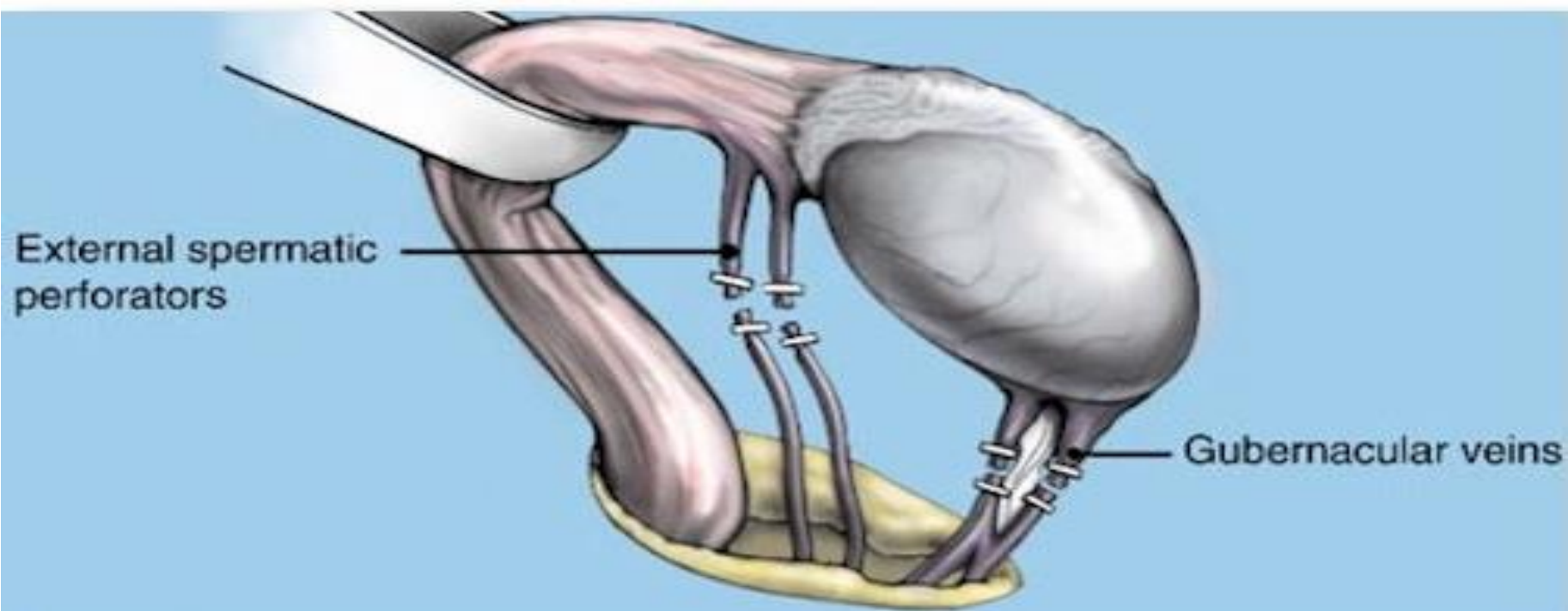


## 6.DELIVERY OF THE TESTICLE

- The testis is delivered through a 2 to 3 cm inguinal incision, and all external spermatic and gubernacular veins are ligated.
- This technique, thought to prevent varicocele recurrence







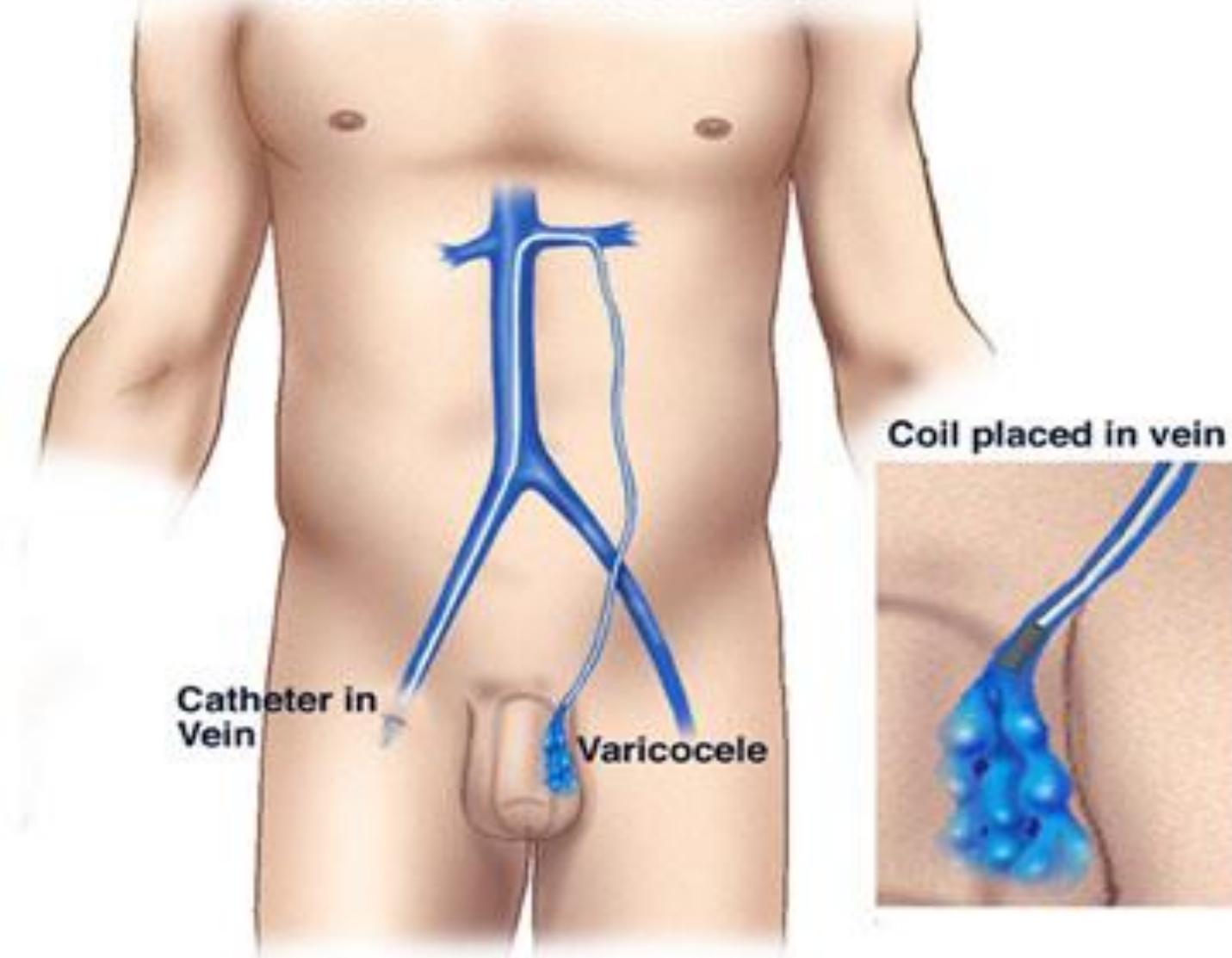
## 7. PERCUTANEOUS EMBOLIZATION

- Involves a cut-down incision over the femoral or internal jugular vein. A catheter is passed to the internal spermatic veins, and the balloon or coils are deployed.
- Complications associated with percutaneous embolization include *balloon deflation and migration, varicocele recurrence, and failure of initial attempted procedures.*





## Varicocele Embolization



# COMPARISON OF TECHNIQUES AND COMPLICATION RATES

**Table 127-2 -- Outcome of Varicocele Ablation Procedures**

Technique	Hydrocele	Recurrence or Failure
Open inguinal/sublingual	3%-9%	15% average
Microscopic inguinal/sublingual	<1%	1%-3%
Retroperitoneal mass ligation	7.2%	2%
Retroperitoneal artery sparing	<7.2%	11%
Laparoscopic	Similar to open	Similar to open
Embolization	None	10%-25%

## PREDICTING SUCCESSFUL REPAIRS

- Several investigators have found significantly higher spontaneous *post-repair pregnancy rates 61%* in couples in whom the man's initial sperm concentration was greater than 5 million sperm/mL



- Marks, McMahon, and Lipshultz were able to identify four preoperative factors associated with an increased likelihood of postoperative pregnancy. These factors included:

- 1.lack of testicular atrophy*
- 2.sperm density greater than 50 million per ejaculate*
- 3.sperm motility of 60% or more*
- 4.serum FSH values less than 300 ng/mL (normal, 50 to 300 ng/mL).*



## *FOLLOW-UP*

- **A semen analysis should be performed 4 months after varicocele repair. Semen should be monitored regularly for at least 1 year or until pregnancy is achieved**

