Varicocoele

Definition: dilatation of the veins of the pampiniform plexus of the spermatic cord due to an absence of venous valves (see Appendix)

Demographics
15% of men
30-40% of men with infertility
Up to 70% of men with secondary infertility
>90% on left

Presentation
1. Altered semen quality and infertility
    - Typically oligoasthenoteratospermia (OAT)
    - Many theories:
        - Increased temperature
        - Reflux of adrenal.renal metabolites
        - Testicular hypoxia due to stasis
        - Leydig cell dysfunction with decreased androgen production
        - Increased reactive oxygen species
2. Dull aching pain
3. Cosmetic concerns
4. Impaired testicular growth in adolescence

Diagnosis

Grade	***Findings***
I (small)	Palpable only with the Valsalva maneuver
II (moderate)	Palpable without the Valsalva maneuver
III (large)	Visible through the scrotal skin

Radiological diagnosis – veins measuring 3.5mm or larger in diameter demonstrating reversal in flow on valsalva. Non-palpable varicocoeles – even with valsalva – are not grade 1, but in fact 'subclinical' varicocoeles

Management considerations
Varicocoele repair;
- Unequivocally improves semen parameters
- Probably improves Leydig cell function (serum androgens)
- Only beneficial for palpable varicocole – no evidence for benefit in subclinical varicocoele (Jarrow 1996)
- May improve take home baby rates, but controversial:
    - 2 RCTs (Madgar 1995; Neischlag 1998) show conflicting results
    - Evers meta-analysis (Lancet 2003) famously found no benefit (p=0.06) but included patients with subclinical varicocoeles and men with no sperm abnormality. Also over 50% lost to follow-up and despite low numbers ITT analysis performed. Although not as statistically robust, when 'as treated' groups analysed, the results favour varicocoele repair.

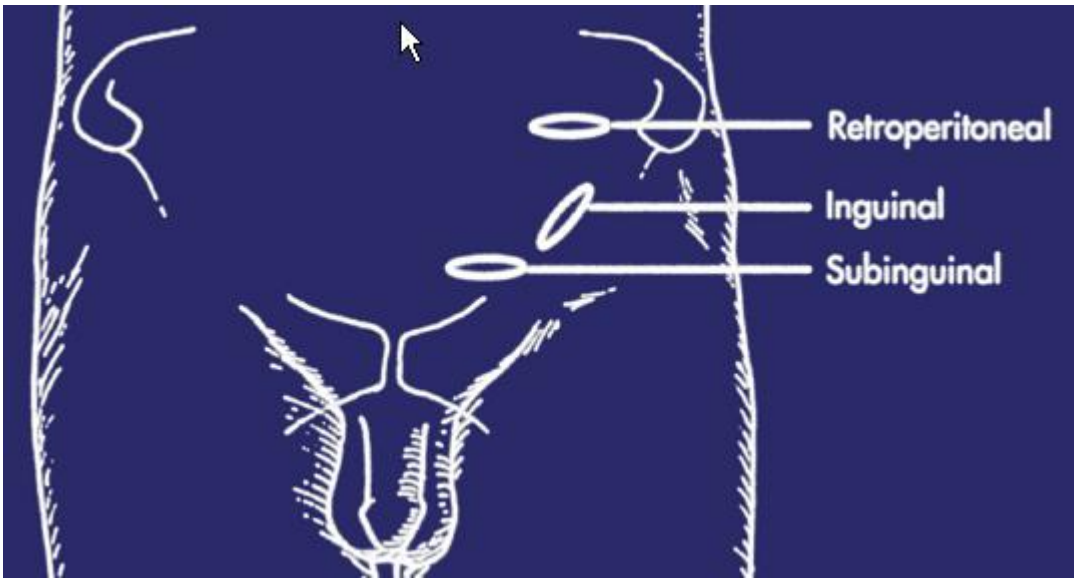
Recent updated meta-analysis including only men with infertility, palpable varicocoele and at least one abnormal sperm parameter shows an odds ratio of pregnancy of 2.87 favouring varicoele repair vs. no treatment (Marmar 2007)

Better outcomes in those with:
- sperm counts > 5 million/ml
- no testicular atrophy
- normal sperm motility
- low serum FSH (<300ng/ml)

recommended in boys with >= 20% reduction in volume cf.other side – limited evidence of 'catch-up' growth

Management options (5)

Percutaneous embolisation
Laparoscopic clipping
Retroperitoneal (Palomo 1948)
Conventional inguinal
Microscopic inguinal or subinguinal



Technique	*Artery Preserved*	*Hydrocele (%)*	*Recurrence (%)*
Retroperitoneal	No	7	11-15
Conventional inguinal	No	3-39	9-16
Laparoscopic	Yes	5-8	<2
Radiographic	Yes	0	4-11
Microscopic inguinal or subinguinal	Yes	0	<2

Percutaneous embolisation

Originally reported using sclerotherapy (Lima 1978)
Now typically coils, gelfoam or balloons
Particularly useful for recurrences – delineates anatomy

Avoids GA
Day-case procedure
Low hydrocoele rate
Complications
- Technical failure — older series report ~ 25%
- Recurrence — 4-11%
- Groin infection/haematoma/DVT

Laparoscopic

Ligation of testicular vein(s) draining via retroperitoneum
Concomitant ligation of testicular artery advocated by some – but small risk of testicular artery
Requires GA
Increased risk of significant complications cf. other procedures
Also ~5% risk of neuropraxia of anterior thigh ?diathermy injury to genitofemoral nerve

Retroperitoneal approach

Originally described by Palomo in 1948
Open equivalent of laparoscopic approach
2 fingers medial to ACIS – identification and ligation of internal spermatic vein
Preservation of testicular artery in adults, but high recurrence rates (11-15%) believed due to perforators
Lower rates in children and adolescents with intentional ligation of artery

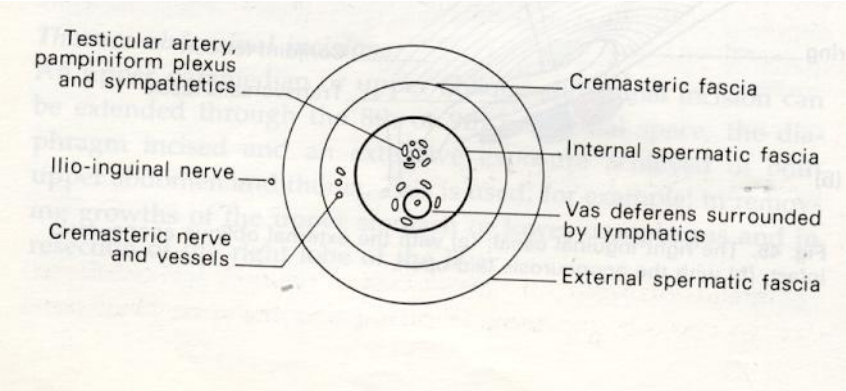
Inguinal and subinguinal approaches

Preferred approaches in US
Subinguinal = minimal morbidity and high success rates, but difficult vs. inguinal
Microscopic techniques associated with lower recurrence and hydrocoele rates for each approach

Appendix

Anatomy of spermatic cord

- 3 layers
  - External spermatic fascia — ext. oblique aponeurosis
  - Cremasteric fascia — cremaster muscle
  - Internal spermatic fascia — transverses abdominis
- 3 arteries
  - Testicular artery* — from aorta
  - Cremasteric artery — from inferior epigastric
  - Artery to the vas — from inferior vesical
- 3 nerves
  - Cremasteric nerve — from genitor-femoral nerve
  - Sympathetic nerves
  - Ilio-inguinal nerve — on cord, not in it
- 3 other structures
  - Vas deferens
  - Pampiniform plexus
  - Lymphatics



* Solitary testicular artery in 50%
  2 testicular arteries in 30%
  3 testicular arteries in 20%