**Varicocele**

Question1 : Define varicocele ?

Answer : Varicocele is defined as abnormally dilated veins of pampiniform plexus or scrotal veins.

Question 2: What are the genital abnormalities associated with varicocele?

Answer: The genital abnormalities associated with varicocele are

1. There is failure of testicular growth and development on the side of varicocoele
2. Patient may have pain and discomfort
3. Male sub-fertility
4. Chances of hypogonadism

Question 3: Define incidence of varicocele in males?

Answer: It is present in 15% of normal males. It is associated with primary infertility in around 19 to 41%. It is associated with secondary infertility in upto 81% cases. It is more common on left side.

Question 4: what are the grades of varicocele ?

Answer : There are three grades of varicocele

subclinical : it is when you detect the varicocele by scrotal ultrasound with Doppler.

grade 1 - detectable only when valsalva manoeuvre is done.

grade 2 - it is palpable without valsalva manoeuvre

grade 3 - when the dilated veins are grossly visible/palpable through the scrotal skin, known as bag of worm appearance.

Question 5 : what are the causes of varicocele ?

Answer - The exact cause of varicocele is not known. Various phenomena are suggested :

i) The left testicular vein inserts into the left renal vein at right angle. This causes turbulent venous flow.

ii) The valves in gonadal vein could be incompetent or absent which causes retrograde reflux of blood into the scrotum veins during standing position.

iii) Nut cracker phenomena occurs when the left renal vein is compressed between the superior mesenteric artery and the aorta.

Question 6: what are the mechanisms of varicocele induced impairment of spermatogenesis?

Answer : there are various theories proposed. these are :

1. Temperature theory : as spermatogenesis is temperature dependent there is venous pooling that causes increase in the intra scrotal temperature which results in

i) decrease in testosterone synthesis bye leydig cells

ii) injury to the germinal cell epithelium

iii) there is altered protein metabolism

iv) decrease in the sertoli cells function

2) Reflux theory - Reflux of renal and adrenal metabolites freely from left renal vein cause direct injury to the gonads .

Question 7: What are the other mechanisms of varicocele induced impairment of spermatogenesis?

Answer : Other mechanism are –

1. impaired venous drainage due to dilated veins lead to hypoxia in the gonads .
2. there is poor clearance of gonadal toxins from the testis .
3. as the grade of varicocele increases there is elevated levels of oxidative stress.

Question 8: How will you diagnose varicocele?

Answer: Following are the ways to diagnose varicocele :

1. Clinically - by physical examination
2. To be confirmed by ultrasound of scrotum/inguinal region with colour Doppler analysis.
3. Antegrade or retrograde venography where sclerotherapy or embolization is done.
4. Thermography
5. Tc 99 pyrophosphate scan.

Question 9: When does varicocele need treatment in a male with/without infertility?

Answer: Following are the indications of treatment in a patient with varicocele:

1. Varicocele is palpable i.e. bag of worms appearance on physical examination.
2. The couple has known infertility and the only cause seems varicocoele after excluding all the causes.
3. Normal fertility of the female partner or a potentially treatable cause of infertility.
4. The male partner has abnormal semen parameters or abnormal results from sperm function tests.
5. Large varicocele causing symptoms e.g. constant dull pain or hemi-scrotal discomfort or sense of heaviness.
6. All adolescents with unilateral or bilateral clinical varicocoeles or ipsilateral testicular hypotrophy (testicular volume ≤ 2ml of volume or decrease of 20% volume from contralateral testis).

Question 10: What are the treatment modalities for varicocele ?

Answer: The treatment modalities for varicocele are as follows :

1. Conservative management: when it is subclinical or not associated with any genital abnormalities.
2. Minimal invasive :

a) Sclerotherapy: Antegrade or retrograde

b) Retrograde embolization using foam or gel.

1. Laproscopic varicocelectomy.
2. Lapro-endoscopic single site varicocelectomy.
3. Robotic varicocelectomy.
4. Open surgical varicocelectomy.

Question 11: What are the different approaches of surgical varicocelectomy?

Answer: The different approaches of surgical varicocelectomy are :

1. Retroperitoneal (Palomo operation)
2. Scrotal approach
3. Inguinal approach (Ivanissevich)
4. High ligation
5. Microsurgical inguinal or subinguinal approach

Question 12: What are the recurrence rates with different approaches?

Answer : The approximate recurrence rates with different approaches are :

i) Antegrade sclerotherapy – 9

ii) Retrograde sclerotherapy – 9.8

iii) Retrograde embolization – 3.8 to 10

iv) Scrotal approach – not known

v) Inguinal approach – 13.3

vi) High ligation - 29

vii) Microsurgical inguinal or subinguinal approach – 0.8 to 4

viii) Laproscopic varicocelectomy – 3 to 7

Question 13: What are the adverse effects and complication rate of Antegrade sclerotherapy?

Answer : Following are the adverse effects of Antegrade sclerotherapy :

1. Testicular atrophy
2. Scrotal hematoma
3. Epididymitis
4. Left flank oedema

Complication rate of Antegrade sclerotherapy is approximately 0.3 to 2.2 %.

Question 14: What are the adverse effects of retrograde sclerotherapy?

Answer: Following are the adverse effects of retrograde sclerotherapy :

1. Adverse reaction to contrast medium
2. Flank pain
3. Persistent thrombophlebitis
4. Vascular perforation

Question 15: What are the adverse effects of retrograde embolization?

Answer : Following are the adverse effects of retrograde embolization :

1. Thrombophlebitis- may cause pain
2. Bleeding leading to haematoma
3. Infection
4. Perforation of the vein
5. Hydrocele formation
6. Radiological complications – contrast nephropathy
7. The coils may migrate or get misplaced
8. Retroperitoneal bleeding/haemorrhage
9. Retroperitoneal fibrosis
10. Obstruction of the ureter

Question 16: What are the adverse effects of varicocele surgery through scrotal approach?

Answer : Following are the adverse effects of varicocele surgery through scrotal approach :

1. Atrophy of the testis
2. Risk of devascularisation due to arterial damage which may lead to testicular gangrene
3. Scrotal bleeding/haematoma
4. Post-op hydrocele.

Question 17 : What are the complication of varicocele surgery through inguinal, sub-inguinal, high ligation and laproscopic approaches ?

Answer : Approach Complication

1. Inguinal approach : possibility of missing out a testicular vein

and high ligation Chances of hydrocele

1. Sub-inguinal approach : hydrocele, arterial injury, scrotal bleeding/hematoma
2. Laproscopic approach : testicular artery injury and injury to lymph vessels,

 Bowel injury, and injury to vessels & nerve damage

 Pulmonary/CO2 embolism, peritonitis due to bowel injury,

 Bleeding from abdominal wall or any major vessel injury

 Right shoulder tip pain due to pneumoperitoneum,

 Pneumo-scrotum due to leakage of CO2, wound

 sepsis/infection.

**ADOLESCENT VARICOCOELE**

Question 18 : What is the epidemiology of varicocele in adolescents ?

Answer : The prevalence of varicocele is around 4-39%.

The age of presentation is around 17 years of age.

Underweight patients have more chances of varicocele.

Overweight and obese patients have less chances of developing varicocele.

The first-degree relatives have higher chances of getting varicocele.

There is a strong association among presence of clinical varicocele and varicose veins.

Question 19: what is the pathophysiology of varicocele?

Answer: Dilated veins of Pampiniform plexus and scrotal veins

 ↓↓

 Increased scrotal temperature

 ↓↓

Interruption of normal cooling properties of the counter current exchange

 ↓↓

 Decreased expression of heat shock proteins – HSPA2

 ↓↓

 Maturation arrest in spermatocytes and spermatids

 ↓↓

 Failure to develop a defense against heat stress

 ↓↓

 Oligospermia

Question 20: How will you evaluate a case of varicocoele?

Answer: 1. Physical examination : in warm room to grade the varicocoele

 - supine position

 - standing position.

2. To know the size of testis by either ultrasound or orchidometry.

Question 21: What do you mean by orchidometry? How will you measure the size of testis?

Answer: Orchidometry refers to the clinical measurement of the testicular volume. There are various methods to measure the size of testis. These are :

i) Prader orchidometry, in which a calibrated string of 12 beads is used as a volume reference.

ii)Takihara/Rochester orchidometry, in which 15 punched-out cards are used to estimate the volume of a testicle placed within each card.

Both of these methods over-estimte the testicular volume.

Question 22: How will you measure the size of testis by ultrasound?

Answer: Two formulae are used to measures the volume of testis by Ultrasound. These are

1. Ellipdoid formula = Length X Width X Height X 0.52. May under-estimate the testicular volume.
2. length X width X height X 0.71. May over-estimate the testicular volume. This is more accurate.

Question 23: How will you measure differential volume of testis?

Answer: It is measured by the formula :

(Volume RIGHT – Volume LEFT) **/** Volume RIGHT

 OR

(Volume LEFT – Volume RIGHT) **/** Volume LEFT.

Question 24: What are the indications of surgery in an adolescent male with varicocoele?

Answer: Following are the indications of surgery in an adolescent male with varicocoele :

1. Adolescent males

unilateral or bilateral varicocele

objective e/o decreased testicular size ipsilateral to the varicocele

A persistent testis volume differential >20% in children too young to evaluate by semen analysis,

1. Low testicular volume in later adolescence.
2. When objective e/o decreased testis size not present then, adolescents with varicoceles be followed annually for
* objective measurements of testis size
* semen analyses

to detect the earliest sign of varicocele- related testicular injury.

Varicocele surgery should be done/offered at the first detection of either testicular or semen abnormality.

1. An abnormal semen analysis, if a sample can be produced.
2. Intervention should be considered before Tanner 5 maturity.
3. Pain is less common indication of surgery as compared to adults.
4. Rest of the indication are as described for adults above.

Question 25: How will you follow the adolescents with varicocoele?

Answer: Follow up the adolescents with varicocoele :

1. Clinical examination is done biannually.
2. Examination with an orchidometer is performed annually.
3. Annual semen analysis.
4. Laboratory tests for androgen production (serum testosterone, FSH, LH) when semen analysis and/or testicular size changes.
5. When total testis volume/androgen production/semen analysis are abnormal, then treatment is done/offered.
6. Subclinical varicocele should be followed with an eye on left side.