**Varicocele**

Question1 : Define varicocele ?

Answer : Varicocele are abnormally dilated veins of pampiniform plexus or scrotal veins.

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

Answer: Genital abnormalities associated with varicocele are

1. Failure of ipsilateral testicular growth and development
2. Symptoms of pain and discomfort
3. Male subfertility
4. Hypogonadism

Question 3: what is the 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 upto 81% cases of secondary infertility. It is more common on left side as compared to right.

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 - when it is detectable only during valsalva manoeuvre.

grade 2 - it is palpated without valsalva manoeuvre

grade 3 - when the veins are grossly visible/palpable through the scrotal skin. It is also 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. these could be :

i) turbulent venous flow related to right angle insertion of left testicular vein into left renal vein ii) incompetent or absent Venus valves in Gondal vein which allows retrograde reflux into the scrotum veins in standing position

iii) Nut cracker phenomena - this 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 - free Reflux of renal and adrenal metabolites 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 gonado toxins from the testis .
3. as the grade of varicocele increases where 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 on physical examination.
2. The couple has known infertility.
3. The female partner has normal fertility 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 that cause symptoms e.g. dull hemi-scrotal discomfort or sense of heaviness.
6. Adolescent males with unilateral or bilateral clinical varicocoeles or ipsilateral testicular hypotrophy ( less than or equal to 2ml of volume or 20% volume decrement 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 modalities : a) Sclerotherapy: Antegrade or retrograde b) Retrograde embolization using foam or gel.
3. Laproscopic varicocelectomy.
4. Laparoendoscopic single site varicocelectomy.
5. Robotic varicocelectomy.
6. 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. Pain due to thrombophlebitis
2. Bleeding haematoma
3. Infection
4. Venous perforation
5. Hydrocele
6. Radiological complications (e.g. reaction to contrast media)
7. Misplacement or migration of coils
8. Retroperitoneal haemorrhage
9. Retroperitoneal fibrosis
10. Ureteric obstruction

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. Testicular atrophy
2. Arterial damage with risk devascularisation and testicular gangrene
3. Scrotal haematoma
4. Post-operative 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 and high ligation : possibility of missing out a testicular vein

Chances of hydrocele

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

Bowel and vascular injury, nerve damage

Pulmonary embolism, peritonitis, bleeding

Right shoulder pain due to pneumoperitoneum,

Pneumoscrotum, wound 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 varicocele.

First degree relatives have higher chances of varicocele.

There is a strong association between 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 supine and standing position in warm room to grade the varicocoele.

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

Question 21: What do you mean by orchidometry? What are the different methods used to measure the size of testis?

Answer: Orchidometry refers to the clinical measurement of testis volume. There are different methods used 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. this formula under-estimates the testicular volume.
2. length X width X height X 0.71. this formula over-estimates the testicular volume but is more accurate.

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

Answer: The differential volume of testis is measured by the formula :

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

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 who have unilateral or bilateral varicoceles and objective evidence of reduced testicular size ipsilateral to the varicocele should be considered candidates for varicocele repair. A persistent testis volume differential >20% in children too young to evaluate by semen analysis,
2. Low testicular volume in later adolescence.
3. If objective evidence of reduced testis size is not present, adolescents with varicoceles should be followed with annual objective measurements of testis size and/or semen analyses in order to detect the earliest sign of varicocele- related testicular injury. Varicocele repair should be offered at the first detection of testicular or semen abnormality.
4. An abnormal semen analysis, if a sample can be produced.
5. Intervention should be considered before Tanner 5 maturity.
6. Pain is less common indication of surgery as compared to adults.
7. Rest of the indication are as described for adults above.

Question 25: How will 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. Semen analysis annually.
4. Laboratory tests for androgen production (testosterone, follicle-stimulating hormone and luteinizing hormone) if semen analysis and/or testicular size changes.
5. If total testis volume is low, androgen production is low or semen analysis is abnormal, then treatment is offered.
6. Subclinical varicocele should be followed with a special look on left side.