



INFERTILITY EVALUATION

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TUBOPERITONEAL FACTOR

Causes of tubal factor infertility

Distal tubal disease	Proximal tubal disease
PID	Intratubal mucous debris
Tuberculosis	Following pelvic surgery
Appendicitis	Cornual polyp
Postabortal or puerperal sepsis	Salpingitis isthmica nodosa

Causes of peritoneal factor infertility

PID
Endometriosis
Pelvic surgery

EVALUATION

1. Hysterosalpingography
2. Selective salpingography
3. Sonosalpingogography or sion's test
4. Laparohysteroscopy and chromotubation
5. Falloscopy and salpingoscopy

1. HYSTEROSALPINGOGRAPHY (HSG)

Timing –

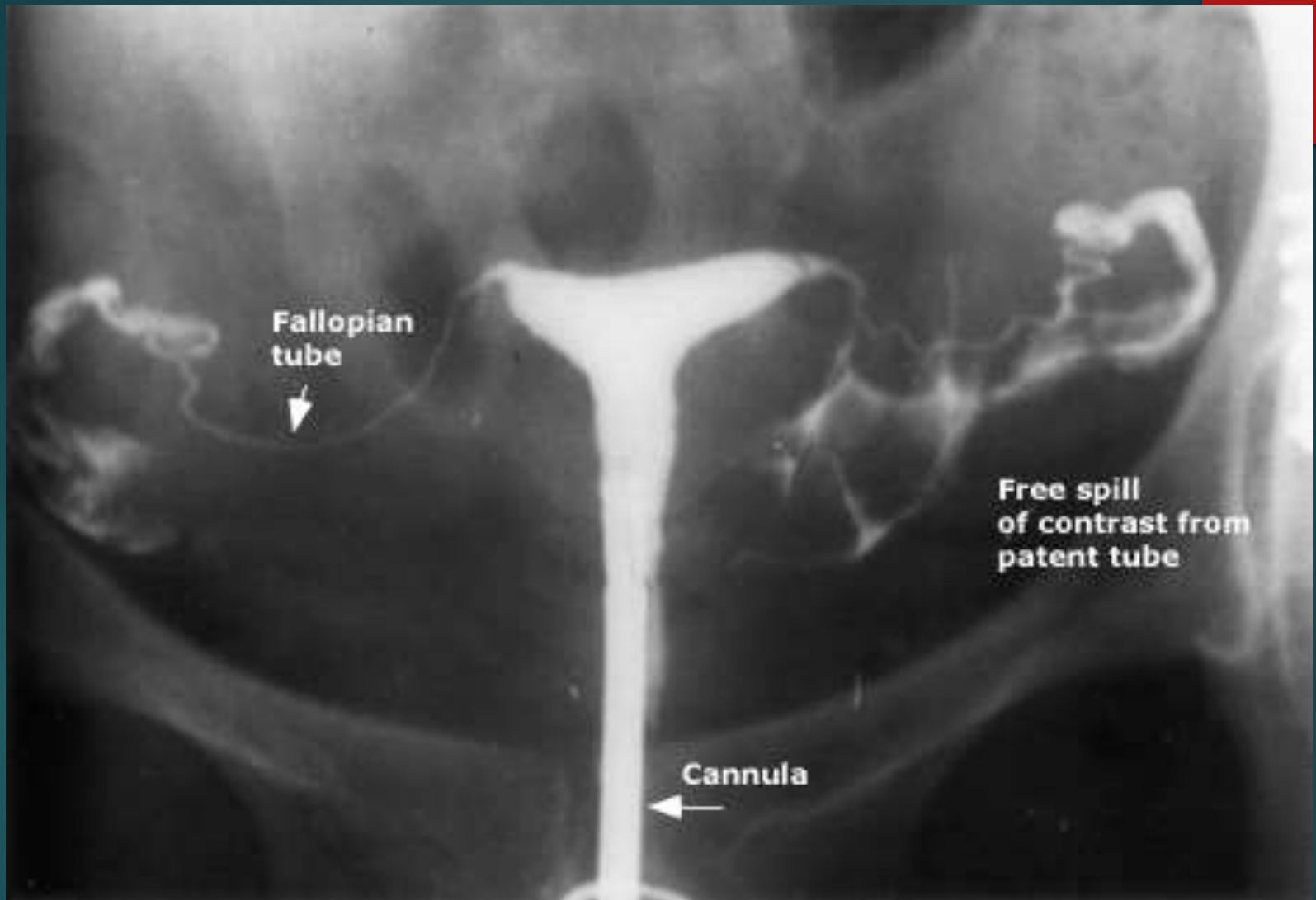
within 10 days of the period and after cessation of flow.

Contraindication –

current or past PID

Procedure –

- ▶ Iodine- based contrast is injected under fluoroscopic guidance using a catheter or cannula.
- ▶ The dye should fill the uterus, tubes and spill freely into the peritoneum.
- ▶ First 3-4ml injected slowly, later 5-10ml
- ▶ 2 films are sufficient



NORMAL HSG



Abnormalities –

Tubal spasm – antispasmodic

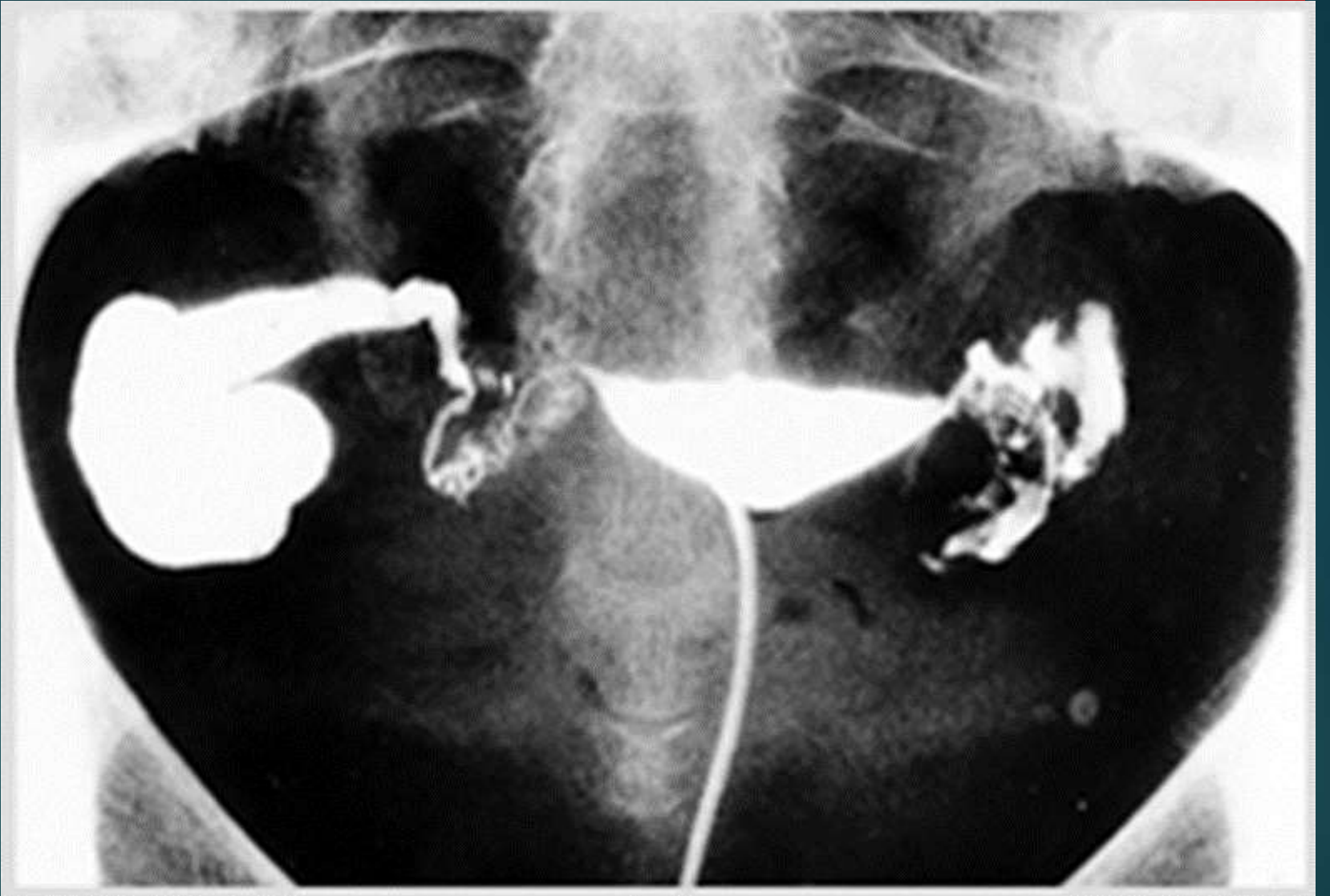
Other causes of proximal tubal block

PID or endometriosis – loculations of dye near the fimbriae

Tuberculosis – beaded appearance

Therapeutic benefit –

Flushing of any inspissated mucus and debris from the tubal lumen allowing fertilization and pregnancy to occur.



HYDROSALPINX

PROXIMAL TUBAL OCCLUSION (PTO)



Problems and limitations –

- ▶ Pain and discomfort
- ▶ Reactivation of latent infection
- ▶ Less sensitive than 3-D USG and hysteroscopy
- ▶ Peritubal adhesions may not be evident in all cases.

2. SELECTIVE SALPINGOGRAPHY

To evaluate proximal occlusion.

Selective tubal cannulation under fluoroscopic guidance.

3. SONOSALPINGOGRAPHY OR SION'S TEST

Saline is infused into the uterus at the time of transvaginal USG.

Less invasive than HSG

Useful in young couples with short duration of infertility.

Albumin mixed with saline or echogenic particles like Echovist – hysterosalpingo contrast sonography or HyCoSy.

4. LAPAROHYSTEROSCOPY AND CHROMOTUBATION

Procedure –

Lap is the gold standard

Double puncture technique under GA

Both diagnostic and therapeutic

Chromotubation – instillation of a dye like methylene blue during lap

Risks –

Risks of GA, bleeding, damage to adjacent organs and infection.



Advantages – the following can be assessed/detected

- ▶ External surface of the tubes
- ▶ Peritubal, periovarian, perihepatic adhesions
- ▶ Endometriosis
- ▶ Tubercles in tuberculosis
- ▶ Congenital uterine anomalies , fibroid
- ▶ Correction at the same sitting



Adhesions between bowel, uterus and adnexa

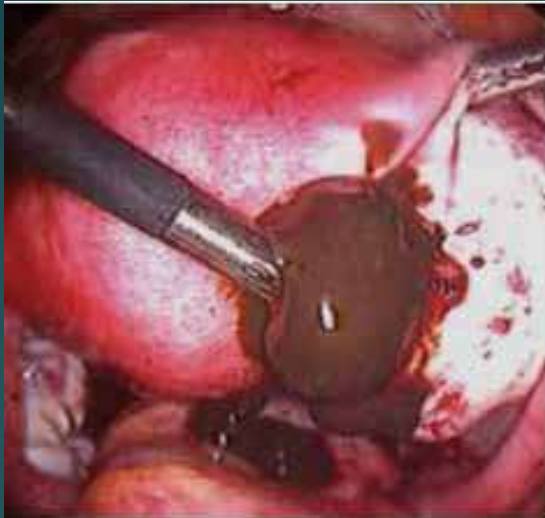


Figure 1 An endometrioma ('chocolate cyst') seen during laparoscopy

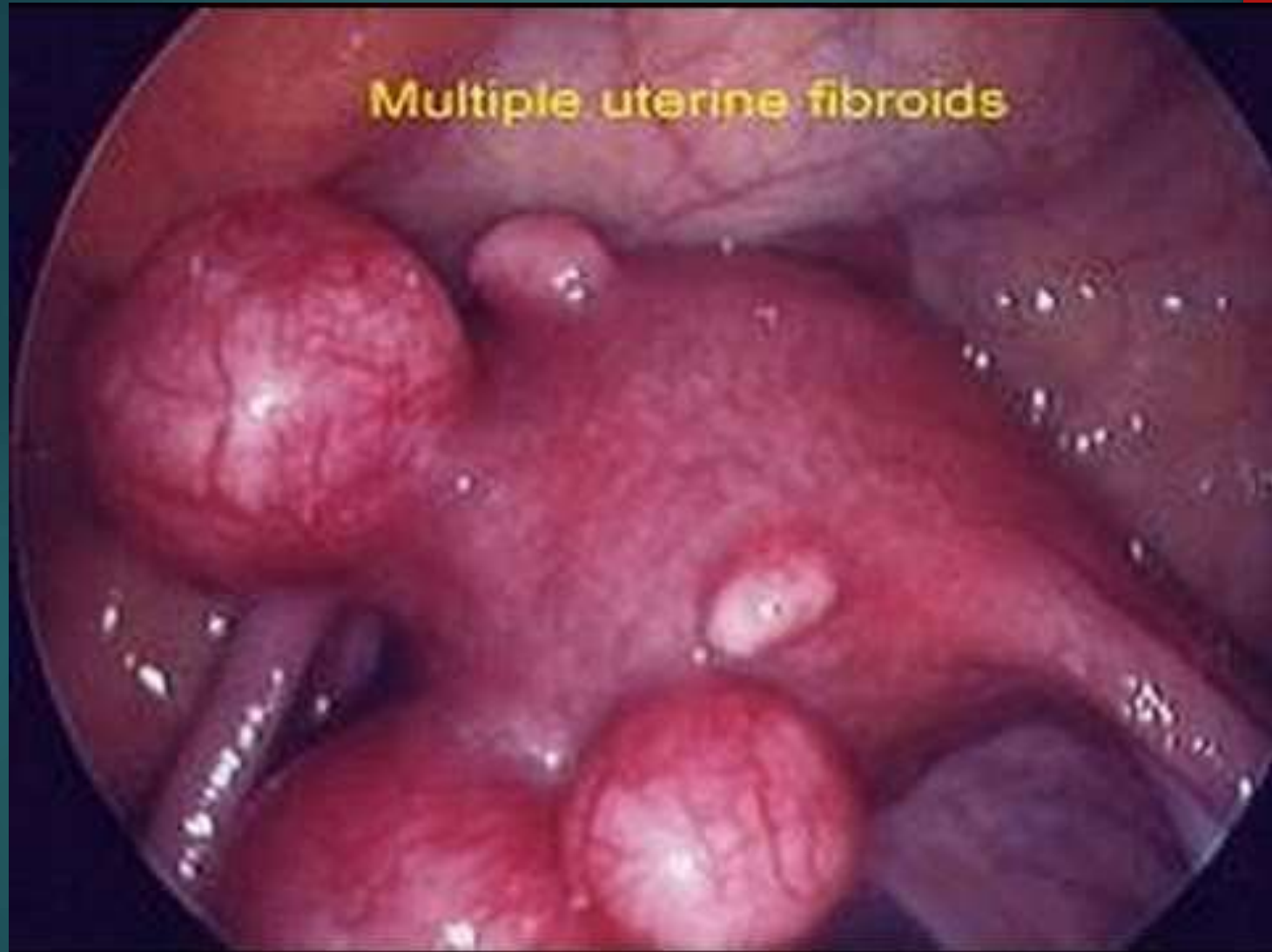


Figure 2 Bilateral kissing ovaries commonly seen in endometriosis



Figure 3 Active endometriotic lesions causing adhesions and distortion of pelvic anatomy

Multiple uterine fibroids





5. FALLOSCOPY AND SALPINGOSCOPY

Both allow visualization of the inner lining of tube.

Unnecessary since increasing use of IVF treatment

MANAGEMENT –

Proximal tubal occlusion –

- ▶ Selective salpingography and fluoroscopic cannulation
- ▶ Hysteroscopic cannulation of the tube
- ▶ IVF treatment if above fail
- ▶ Tubocornual anastomosis using microsurgical procedures

Distal tubal occlusion –

- ▶ Fimbrioplasty
- ▶ Salpingostomy or salpingoneostomy
- ▶ Surgical excision of adhesions
- ▶ IVF treatment

Endometriosis –

- ▶ Laparoscopic excision
- ▶ Adhesiolysis and fulguration
- ▶ Intrauterine insemination followed by IVF

Reversal of sterilization –

- ▶ Laparotomy
- ▶ Laparoscopic tubal anastomoses
- ▶ IVF

CERVICAL AND IMMUNOLOGICAL FACTOR

- ▶ Hostile cervical mucus
 - ▶ Antisperm antibodies in cervical mucus
-
1. Postcoital test (PCT)
 2. Antisperm antibodies

UNEXPLAINED FERTILITY

Probable causes of unexplained infertility

Minimal and mild endometriosis

Peritubal adhesions

Luteinised unruptured follicle

Occult defects in the ovum

Occult defects in sperm

Oxidative stress injury to sperm

MANAGEMENT –

1. *Clomiphene citrate and IUI (8-9%)*
2. *Gonadotrophins and IUI (16-20%)*
3. *In vitro fertilisation (after about 6bcycles of IUI failure)*

Female patient

History

Anovulatory
cause

Tubal or
uterine
cause

Unexplained
fertility
(if
asymptomatic
& none of the
above are
conclusive)

Tests to
document
ovulation

Hormonal
tests

- HSG
- Laparoscopy & chromotubation
- Hysteroscopy
- USG

- Clomiphene citrate & IUI
- Gonadotrophins & IUI
- IVF

PCOS

- Lifestyle
- Clomiphene citrate
- hCG
- Gonadotrophins
- IVF

Hyper-
prolactin
emia

Dopamine
agonists

Hypo-
thyroidi
sm

thyroxine

Hyper-
gonad
ism

IVF or
ovum
donation

Hypo-
gonadi
sm


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ns



EVALUATION OF A MALE PATIENT

History

- Ask For Pubertal Development And Difficulties With Sexual Function.
- Erectile Dysfunction, Decreased Beard Growth - Decreased Testosterone.
- Developmental Anomalies - Testicular, urethral
- Sexually Transmitted Diseases Or Frequent Genitourinary Infections,

- 
- Varicocele, Testicular Torsion, Trauma - Defective Spermatogenesis
 - Medical History- DM, HTN, Chemotherapy
 - Drugs- Cimetidine, Erythromycin, Gentamicin, Tetracycline And Spironolactone, Anabolic Steroids
 - Lifestyle – smoking, obesity, occupation, alcohol, marijuana, cocaine

Physical examination

- Signs Of Testosterone Production
- Asses The Secondary Sexual Characteristics
- Male Pattern Balding
- Exam The Penile Urethra, hypospadias
- Scrotum- size, consistency, hernia
- Testis - Length (4cm),Volume (20ml), descent
- Epididymal Fullness (Vas Obstruction)
- Palpate vas deference
- Palpate For Testicular Mass And Varicocele.
- Rectal exam- Prostate and seminal vesicles

CAUSES

- **Pretesticular:**
- Hypogonadotropic hypogonadism which can be congenital or acquired, eg.-Kallman's syndrome



➤ **Testicular:**

- Genetic Eg.- Klinefelter's Syndrome
- Congenital Eg.-Cryptorchidism
- Traumatic Eg.- Torsion, Trauma
- Infections Eg.-Mumps, Orchitis
- Environmental Toxins
- Drugs Eg.- Chemotherapy, Irradiation;
- Vascular Causes Eg.- Varicocoele



➤ **Post testicular or obstructive**

- Congenital b/l absence of vas deferens
- Obstruction of vas or epididymis by tuberculosis or STD
- Cystic fibrosis
- Kartagener's syndrome
- Young's syndrome

SEMEN ANALYSIS

First test to be done before invasive tests

2-3 days of abstinence. Into a wide mouthed clean container. Kept at room temperature and received in the laboratory within one hour of collection.

Atleast 2 samples have to be abnormal for considering male factor infertility.

Parameter	Normal value
Volume	>2 ml
pH	7.2-8
Sperm concentration	>20 million/mL
Sperm motility (within 60 mins of ejaculation)	>50% Progressive or >25% rapidly progressive
Morphology	>30% normal
WBCs	<1 million/mL

Interpretation

- ▶ Oligospermia:

Moderate- 5 to 20million/ml

Severe- <5 million/ml


- ▶ Aesthenospermia: reduced motility
- ▶ Azoospermia: no sperm in semen
- ▶ Teratozoospermia: increased abnormal morphology of sperms
- ▶ Aspermia: no semen
- ▶ Leukospermia: increased white cells in semen

TREATMENT

- ▶ General: lifestyle modifications
- ▶ Medical:
 - only in hypogonadotropic hypogonadism
pulsatile GnRH therapy
 - hCG injections 1000-2500 IU twice a week
combined with human menopausal
gonadotrophin at 150 IU thrice weekly (about 80%
after 1 year)
 - Follow up after 3 months

OTHER TESTS

- ▶ Sperm function tests: determine capacity of sperm or fertilization potential and are useful prior to IVF. Eg- Hypoosmotic swelling test. If intact swells up and coils, Acrosin assay, zona free hamster egg penetration assay
- ▶ Hormonal tests: FSH, LH, testosterone in case of azoospermia and oligoasthenoteratozoospermia
- ▶ Transrectal or transscrotal ultrasound: ejaculatory duct obstruction
- ▶ Genetic testing
- ▶ Testicular biopsy: Viable sperm present in seminiferous tubules

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- Surgical treatment
 - Varicocele correction
 - Microsurgical anastomosis: epididymal obstruction and following vasectomy
 - Intrauterine insemination & ART
 - IVF & ICSI
 - Surgical retrieval of sperms for ICSI
 - Donor insemination

Male patient with complaints of infertility



History



Physical examination

- General examination
- Genital examination



Semen analysis



IUI & ART



Sperm function tests



if membrane is intact



IVF & ICSI



Hormonal tests



- GnRH therapy
- hCG injections



USG



Surgical retrieval
MESA, PESA,
TERE, TESA

THANK YOU