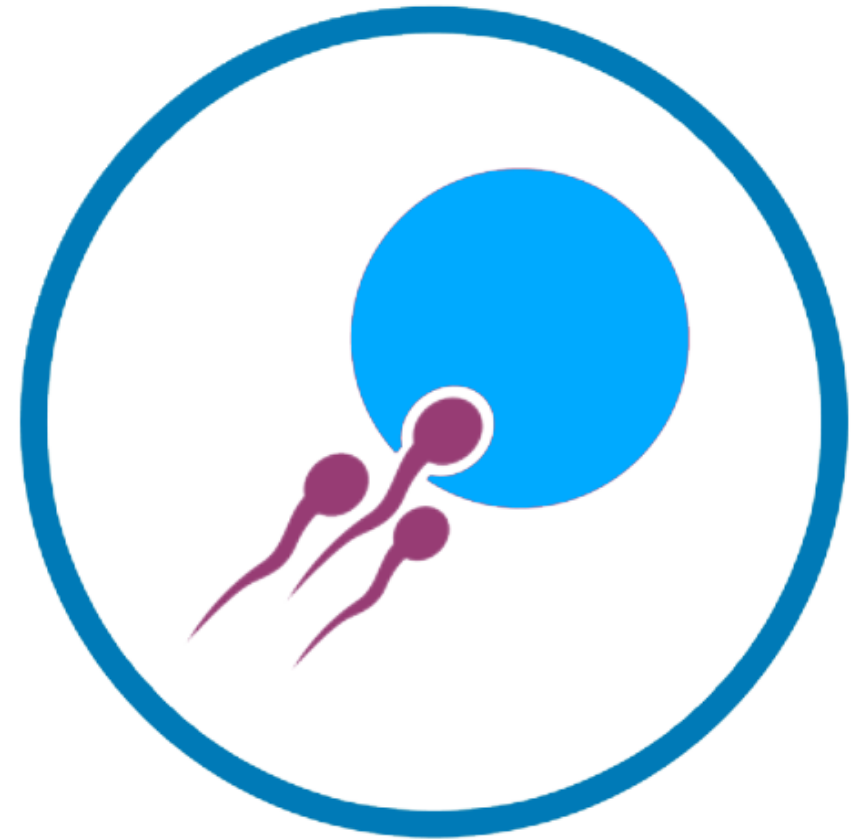


OB GYN SONOGRAPHY REVIEW

Infertility Studies



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Course Outline

- Cases of Male Infertility
- Causes of Female Infertility
- Treatment of Infertility
- Sonography in Infertility Management



Causes of Male Infertility



Male Infertility

- Less common but investigated first because tests are less invasive and less expensive
- Causes include
 - Varicoceles (40%)
 - Semen disorders (low sperm density & motility)
 - Abnormal sperm morphology
 - Presence of antisperm antibodies
 - Cryptorchidism
 - Testicular failure
 - Endocrine disorders
 - Infections
 - Genetic factors

Causes of Female Infertility



Female Infertility

- Most common causes include
 - Ovarian/ovulatory dysfunction (40%)
 - Tubal disease
 - Cervical factors
 - Endometriosis and other uterine factors
 - Intrauterine contraceptive devices

Ovulation Disorders

- Etiological factors associated with anovulation:
 - Failure of the hypothalamus and pituitary to produce hormones stimulating ovulation
 - Failure of the follicle to rupture:
 - Unruptured follicle syndrome
 - Dysfunctional dominant follicle
 - Polycystic ovarian disease

Tubal Factors

- Abnormality of tubal transport and/or tubal obstruction are primary etiologies
- Transport abnormalities result from damage to ciliated epithelial lining resulting from:
 - Pelvic inflammatory disease
 - Prior ectopic pregnancy
 - Prior tubal surgery
- Mechanical obstruction caused by:
 - Endometriosis
 - Uses of IUDs
 - Prior elective abortion

Cervical Factors

- Cervix plays an important role in transport and capacitation of sperm
- Abnormalities that affect fertility include:
 - Factor affecting cervical mucus secretions
 - Cervical stenosis caused by:
 - Infections
 - Surgical procedures
 - Radiation

Uterine Factors

- Uterine abnormalities affecting fertility may be:
 - Congenital
 - Müllerian duct anomalies
 - DES exposure *in utero*
 - Acquired
 - Asherman syndrome
 - Uterine polyps
 - Submucosal fibroids

Treatment of Infertility



Methods of Treatment

- Male factors usually diagnosed and treated by urologist
- Female factors may be treated by:
 - Pharmacological methods
 - Assisted reproductive technologies

Pharmacological Methods

- **Clomiphene citrate** (Clomid) an estrogen analog that stimulates production of FSH
 - Multiple follicles form in both ovaries
 - Increase likelihood that one will mature and ovulate
 - Adverse affects include:
 - Ovarian hyperstimulation syndrome
 - Supernumerary pregnancies

Pharmacological Methods

- **Human menopausal gonadotropin** (Pergonal) contains FSH and luteinizing hormone
 - Stimulates ovulation when ovary is capable of producing follicle
 - Adverse affects include:
 - Ovarian hyperstimulation syndrome
 - Supernumerary pregnancies

Pharmacological Methods

- **Gonadotropin-releasing hormone agonists** contains FSH and luteinizing hormone
 - Induces development and maturation of multiple follicles
 - Increase likelihood that ovulation will occur

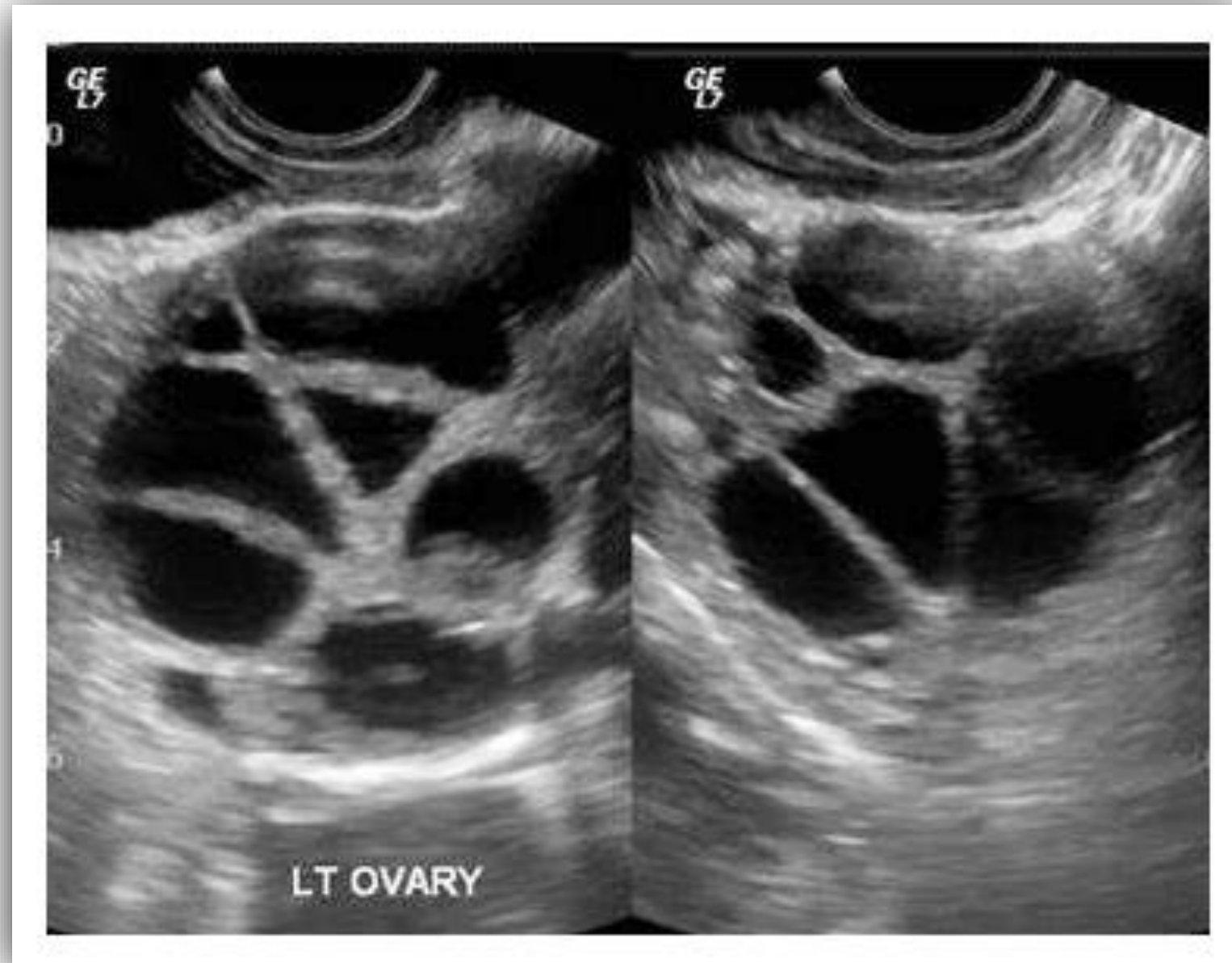
Ovarian Hyperstimulation Syndrome

- **Ovarian hyperstimulation syndrome** can result from induced follicular stimulation
- Characterized by:
 - Massive, bilateral ovarian cystic enlargement
 - Peritoneal and pleural fluid collections
 - Clinically, syndrome can be mild, moderate, severe
 - Sequelae include: hypotension, oliguria, electrolyte imbalances, thromboembolic complications (DVT)
 - Ovarian torsion

Ovarian Hyperstimulation Syndrome

- Sonographic findings include:
 - Bilateral cystic symmetric enlargement of ovaries
 - Variably sized cysts
 - Radial arrangement of cystic areas around ovary “spoke-wheel” sign
 - Ascites, pleural, and/or pericardial fluid may be identified

OVARIAN HYPERSTIMULATION SYNDROME



Massive cystic ovarian enlargement

OVARIAN HYPERSTIMULATION SYNDROME



Spoke-wheel appearance

OVARIAN HYPERSTIMULATION SYNDROME



Pleural effusion

SUPERNUMERARY PREGNANCIES



Quadruplets

Assisted Reproductive Technology

- Methods of achieving pregnancy by artificial means and include:
 - *In vitro fertilization*: sperm and oocyte combined outside the body. Conceptus is introduced into uterine cavity
 - *Gamete intrafallopian transfer*: sperm and oocyte introduced into fallopian tube via catheterization
 - *Zygote intrafallopian transfer*: conceptus introduced into fallopian tube via catheterization

INFERTILITY STUDIES

Sonography in Infertility Management



Assisted Reproductive Technology

- Indications for the use of sonography in infertility management include
 - Follicular monitoring
 - Endometrial assessment
 - Guided follicular aspiration

Follicular Monitoring

- Endovaginal imaging is used to monitor follicular presence and development
- Provide a quick and accurate method of determining:
 - Number
 - Size
 - Position
 - Assess follicular quality
- Sequential studies monitor growth of individual follicles

Sonographic Methods

- Transabdominal scan performed to obtain “lay of the land” and identify any anatomic abnormalities not typically seen with EV approach
- EV base line scan to evaluate:
 - Uterus: size, shape, echogenicity, presence or absence of pathology, endometrial thickness
 - Ovaries: size, shape, presence or absence of pathology
 - Follicles: number of antral (secondary) follicles in each ovary

ENDOVAGINAL BASELINE STUDY



Endometrial thickness

ENDOVAGINAL BASELINE STUDY



Follicles: subdominant

ENDOVAGINAL BASELINE STUDY

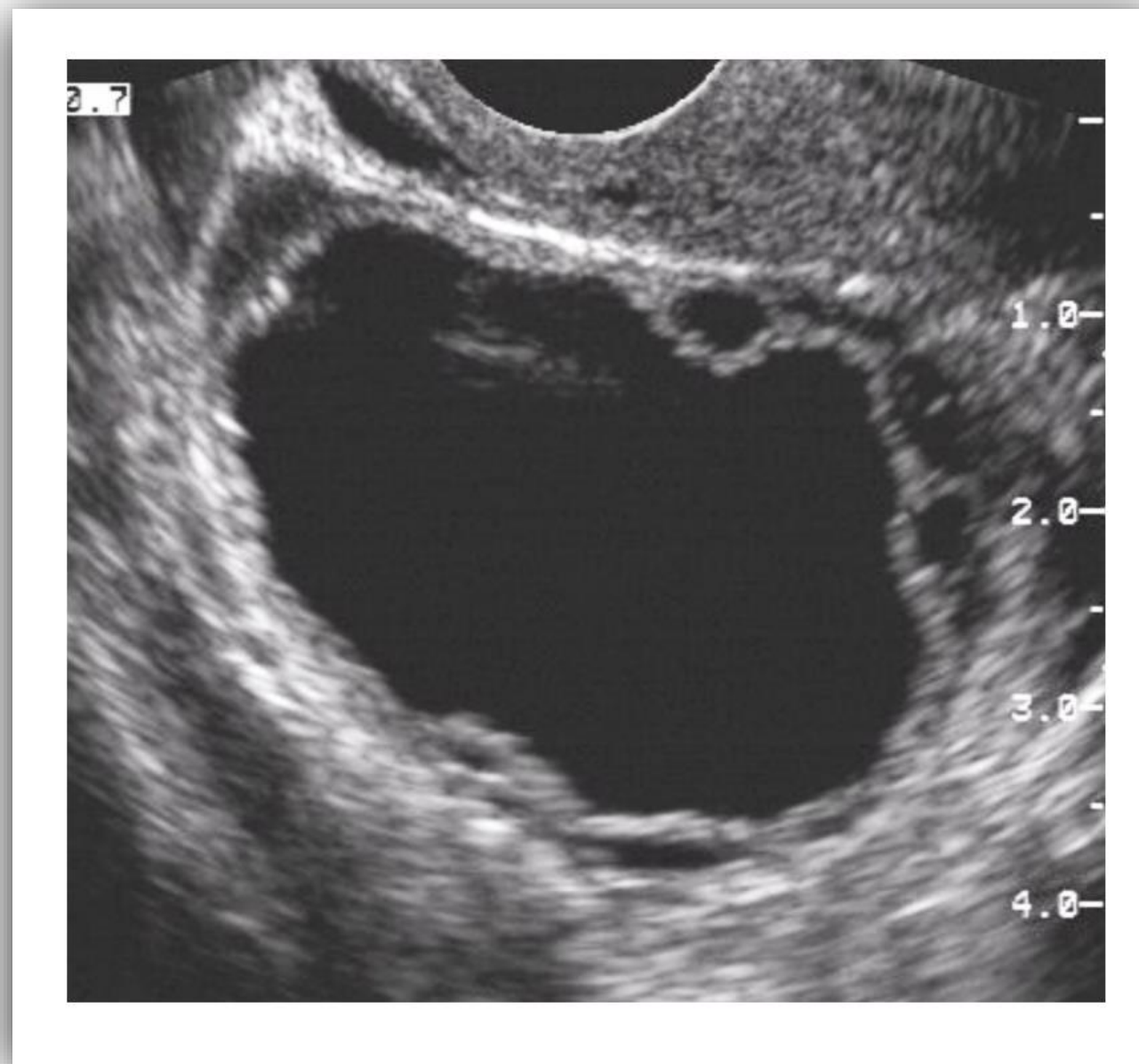


Follicles: dominant

Sonographic Methods

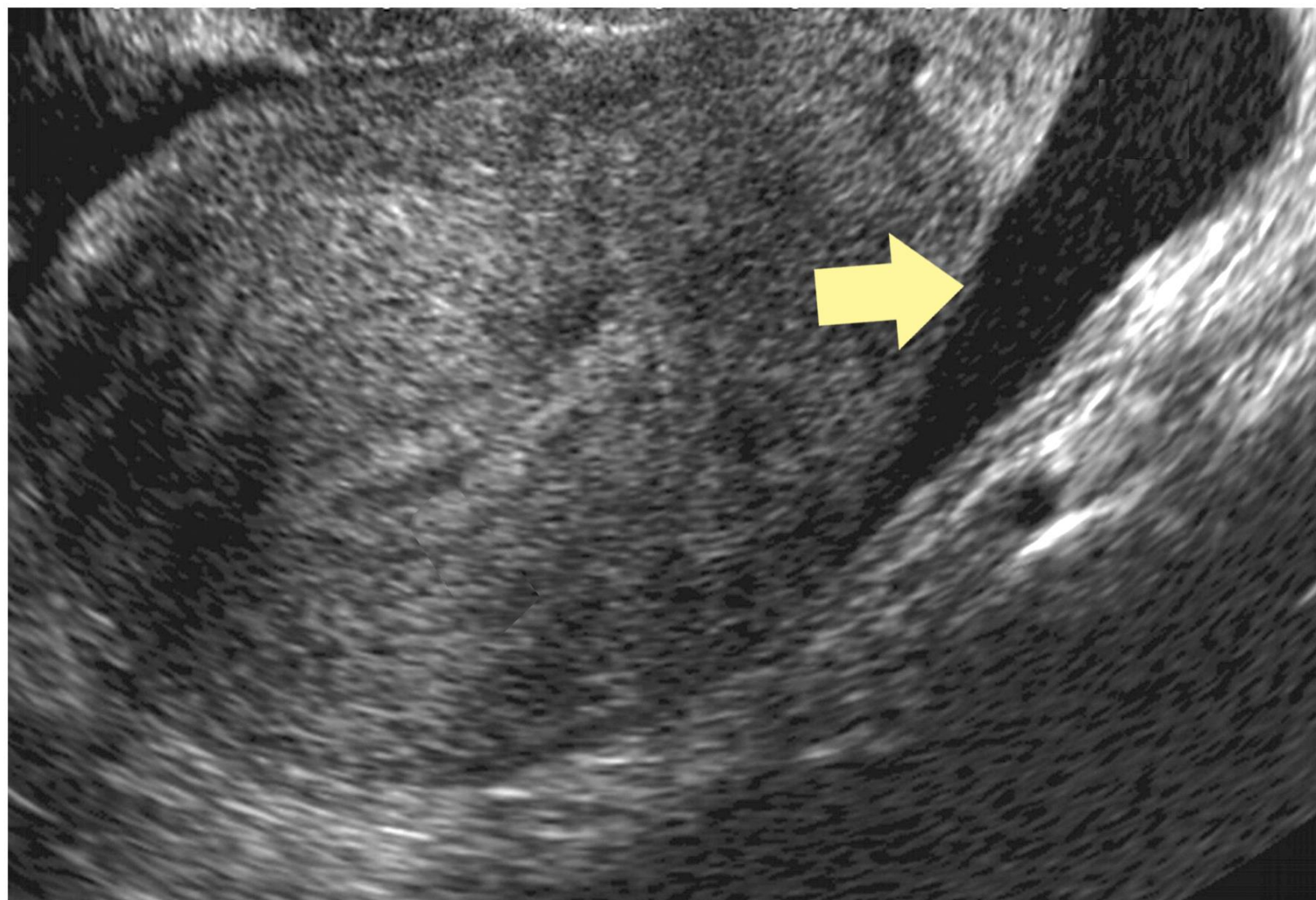
- Serial (daily) EV scans to monitor follicular growth and identify and monitor dominant follicle
- Indices of ovulation:
 - Sudden decrease in follicle size
 - Irregularity of follicle walls
 - Free fluid in posterior cul-de-sac
 - Mean blood flow values return to those seen in nondominant follicles

INDICES OF OVULATION



Irregular follicle walls

INDICES OF OVULATION

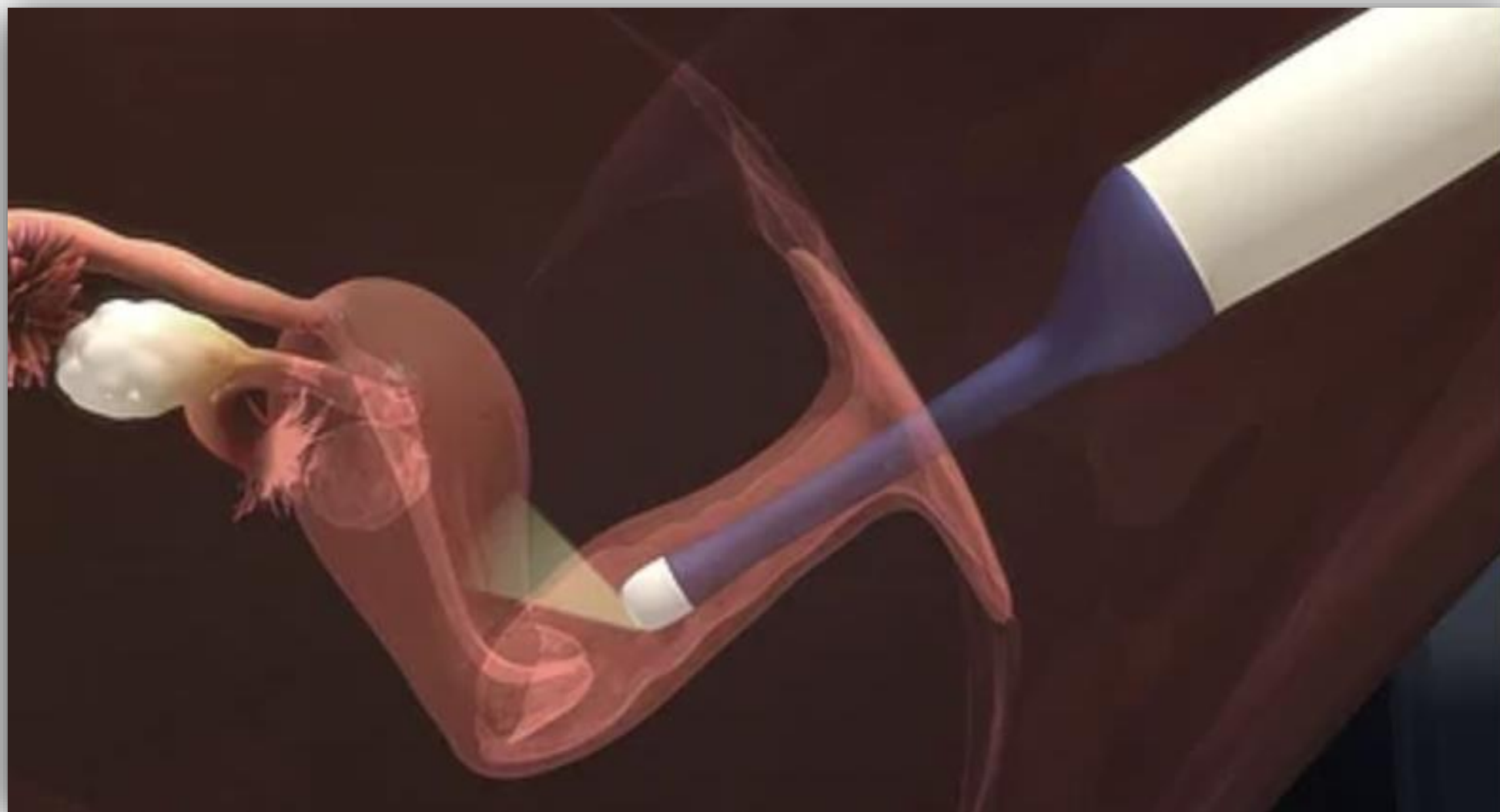


Fluid in cul-de-sac

Guided Follicular Aspiration

- Also called transvaginal oocyte retrieval
- Method of removing oocytes from ovary for use in *in vitro* fertilization
- Needle guide attached to EV transducer
- Target follicle is identified and needle aspiration of content is performed

GUIDED FOLLICULAR ASPIRATION



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