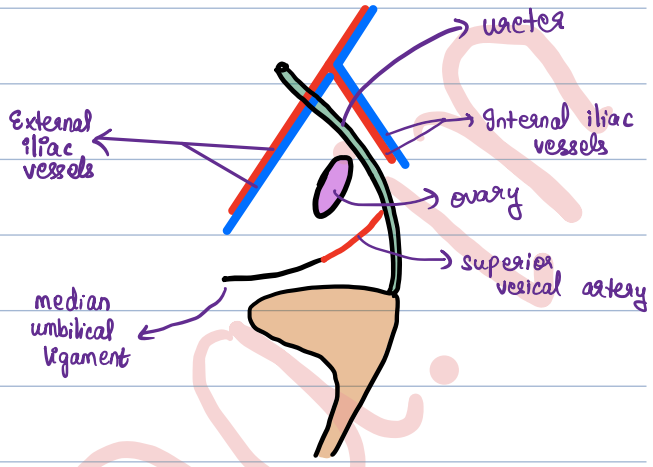
Ovaries:

→ almond - shaped, greyish pink

→ Length: 4cm
width: 2cm
Thickness: 1cm



Location:

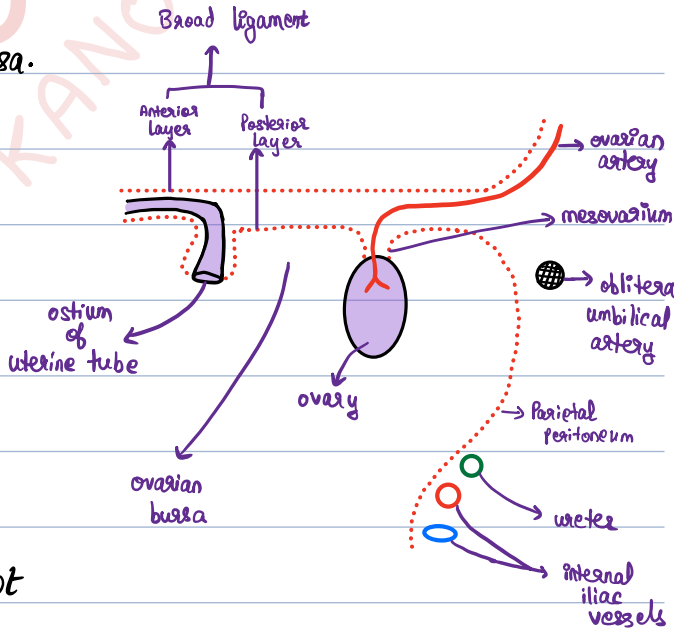
→ In nulliparous women ⇒ in ovarian fossa on lateral pelvic wall

→ ovarian fossa boundaries:

- Anteriorly ⇒ external iliac vessels
- Posteriorly ⇒ ureter & internal iliac vessels
- Inferiorly ⇒ uterine tubes
- obturator N. & vessels cross the floor of the fossa.

Peritoneal Relations:

→ each ovary is attached to posterior surface of broad ligament by peritoneal fold ⇒ mesovarium
↓
contains ovarian vessels.



→ ovary is almost entirely covered by peritoneum except along mesovarium border where 2 layers of peritoneum are reflected on posterior layer of broad ligament.

→ peritoneal layers of mesovarium become continuous with germinal epithelium of ovary

→ junction between flattened mesothelium of peritoneum & cuboidal germinal epithelium is marked by white line of ovary (Line of Fusse)

External Features & Relations:

→ before onset of ovulation, surface of ovary is smooth; but after puberty, it becomes nodular

→ in nulliparous women ⇒ long axis of ovary is almost vertical with:

(i) two extremities/poles (superior, inferior)
(ii) two surfaces (lateral, medial)
(iii) two borders (anterior, posterior)

→ in multiparous women, long axis of ovary becomes horizontal.

Superior Pole: broader than lower pole

↳ related to uterine tube & external iliac vein

→ provides attachment to a peritoneal fold ⇒ suspensory ligament of ovary

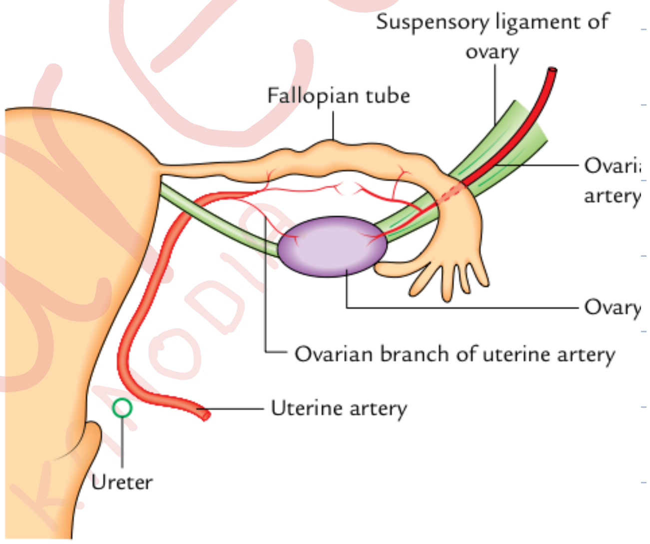


Fig. 18.6 Arterial supply of the ovary.

Inferior Pole: narrower

↳ related to pelvic diaphragm

→ connected to lateral angle of uterus posteroinferior to attachment of fallopian tube by ligament of ovary.

Lateral Surface: convex

↳ in contact with parietal peritoneum lining the ovarian fossa

Medial Surface: covered by uterine tube from which it is separated by a peritoneal recess called ovarian bursa

Anterior (mesovarian) Border: attached to posterior layer of broad ligament.

Posterior (free) Border: directed towards uterine tube & is related to ureter.

Structure: Cortex & Medulla

Cortex: thick peripheral part

↳ contains ovarian follicles in diff. stages of maturation

→ covered by germinal epithelium made of cuboidal cells in younger age

→ later, the epithelium becomes flattened.

→ connective tissue of cortex is condensed to form a whitish tough fibrous layer called tunica albuginea.

Medulla: consists of loose connective tissue containing large blood vessels, particularly veins.

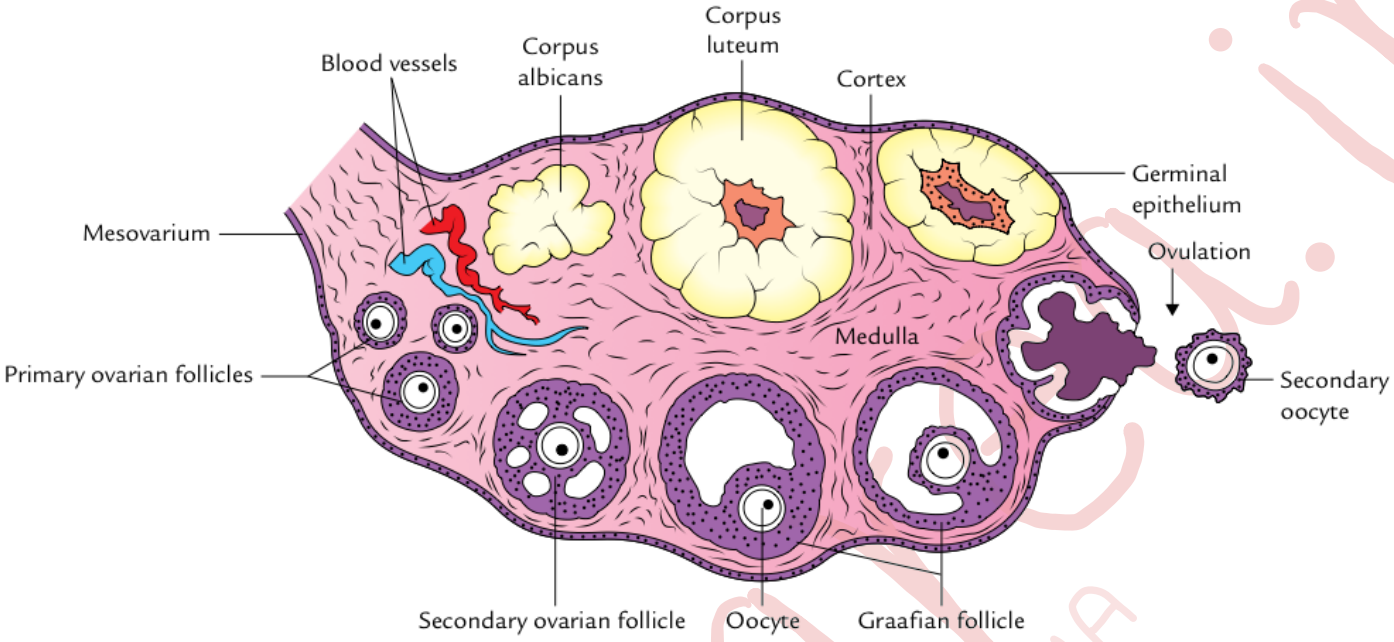


Fig. 18.5 Structure of the ovary.

Arterial Supply:

- **ovarian artery:** → arises from aorta at level of L1
  - ↳ reaches ovary after passing successively through suspensory ligament of ovary, mesosalpinx, mesovarium
  - → terminates by anastomosing with uterine artery.
- **ovarian branch of uterine artery**

Venous Drainage: veins from ovary emerge to form pampiniform plexus around ovarian artery from which a single ovarian vein is formed near superior aperture of pelvis
- → right ovarian vein drains into inferior vena cava
- → left ovarian vein drains into left renal vein.

Lymphatic Drainage: follow ovarian vein & drain into pre-aortic & para-aortic lymph nodes.

Nerve supply: Sympathetic: T10, T11 (vasomotor)
Parasympathetic: S2, S3, S4 (vasodilators)
} derived from abdominal autonomic plexuses

Visceral afferent fibres: T10, T11

∴ ovarian pain is referred to umbilical region supplied by T10.

Functions:

- **Production of oocytes:** alternatively one ripe ovum per menstrual cycle (28 days)
  - ↳ ovum develops into graafian follicle which release ovum on 14th day
  - → after ovulation, empty graafian follicle forms corpus luteum.
- **Production of hormones:** progesterone & oestrogen
  - progesterone ← from luteal cells
  - oestrogen → from follicular cells.

Applied Aspect:

Ovarian torsion: may occur due to abnormally long mesovarium & suspensory ligament of ovary

Prolapse of ovaries: displaced into pouch of Douglas where they can be palpated on per vaginal (PV) examination.

Ovarian cyst: **Small cyst:** formed due to developmental arrest of ovarian follicles

Large cyst: with an encysted fluid may be formed from corpus luteum of pregnancy

↳ causes anteroposterior bulging of abdomen

→ does not present shifting dullness

→ should be differentiated from ascites which presents shifting dullness.

Ovarian carcinoma: 15% of all cancers & 20% of all gynaecological cancers.

Teratoma: ovary may sometimes contain pluripotent cells which may give rise to teratoma.

Development of Ovaries: develop within abdominal cavity from a genital ridge on posterior abdominal wall.

→ on medial side of mesonephros

→ receives primordial germ cells from wall of yolk sac.

→ ovary then descends into pelvis

→ descent involves gubernaculum & processus vaginalis

→ gubernaculum extends from ovary to junction of uterus & uterine tube ⇒ ovarian ligament in adult & continues in labium majus ⇒ round ligament of uterus

→ processus vaginalis is obliterated in adults.

Ovarian dysgenesis: congenital absence of one or both ovaries (found in Turner's Syndrome)

Ectopic ovaries: ovary may fail to descend into pelvis or rarely may be drawn downward with round ligament of uterus into inguinal canal or even into labium majus.

Uterine / Fallopian Tubes:

↳ transmit ova from ovaries to uterine cavity

→ 10cm long

→ lies in upper free margin of broad ligaments

External features: 2 ends, 4 parts

Medial End: opens into lateral angle of uterine cavity

↳ 1mm in diameter

Lateral (Fimbriated) End: communicates with peritoneal cavity close to ovary by piercing posterior layer of broad ligament

↳ 3mm in diameter

→ irregular small finger-like projections called fimbriae present

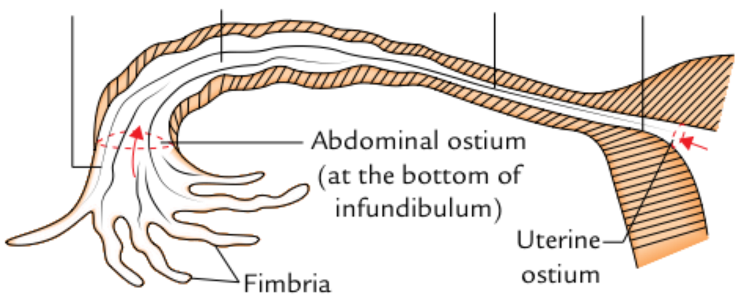
Infundibulum: funnel-shaped

↳ projects beyond broad ligament of uterus

→ presents an abdominal ostium

→ longer fimbria = ovarian fimbria ⇒ acts as a sensor to time the release of ovum (just before release of ovum, fimbriae start sweeping the surface of ovary & facilitate entrance of ovum into fallopian tube.

Parts of uterine tube



Ampulla: widest & longest part

↳ thin-walled & tortuous

→ site of fertilization of ovum

Isthmus: narrowest part

↳ thick muscular wall

Intramural part: traverses uterine wall at junction of body & fundus

→ intramural / interstitial part lies within wall of uterus

Structure: outside inward:

- **Serous coat**: derived from peritoneum
- **muscular coat**: smooth muscle → inner circular, outer longitudinal
- **mucous coat**: lining epithelium & underlying lamina propria.
  - ↳ has 6 primary longitudinal folds which in turn give rise to secondary & tertiary folds
    - ∴ lumen of tube is highly irregular which helps to provide nutrition to the zygote from all sides.
  - → lining epithelium = simple ciliated columnar
    - ciliated columnar cells ⇒ cilia beat to transport fertilized ovum towards uterine cavity
    - non-ciliated secretory cells ⇒ provide nutrition to the fertilized ovum.

Arterial Supply:

- medial 2/3 ⇒ uterine artery
- lateral 1/3 ⇒ ovarian artery

Venous Drainage: correspond to arteries

↳ ovarian & uterine veins

Lymphatic Drainage: follow veins

↳ internal iliac, pre-aortic & para-aortic lymph nodes.

Nerve Supply: Sympathetic fibres: ovarian & superior hypogastric plexuses

↳ T11 - L2

Parasympathetic fibres: Lateral part ⇒ vagus N.

medial part ⇒ pelvic splanchnic nerves (S2, S3, S4)

Applied Aspects:

Salpingitis: inflammation of uterine tube

↳ common causes of tubal block

→ secondary sterility in female

→ due to upward spread of infection from vagina & uterus

→ Test for Patency of Tubal block:

- Insufflation test (or Rubin's test) ⇒ air is pushed into uterus & if tube is patent, air leaks into the peritoneal cavity producing hissing / bubbling sound which can be heard by a stetch over the iliac fossa.
- Hystero-salpingography ⇒ radiopaque substance like Lipiodol is injected into uterus by a canula
  ↳ if tubes are patent, the contrast medium spills into peritoneal cavity.

Ectopic Pregnancy: commonest in the uterine tube ⇒ tubal gestation

↳ usually associated with intraperitoneal haemorrhage

→ haemorrhage occurs due to rupture of tube caused by enlarging conceptus.

Tubectomy: female sterilization method

↳ each fallopian tube is ligated at 2 points & the segment of tube between the ligatures is resected

↳ fertilization cannot occur.