GUS..

Lecture (8)

Anatomy of the Female Reproductive System (1)

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ILOs

1. Understand the anatomy of the breast, blood & nerve supply, and lymphatic drainage..

2. Discuss the location, shape, relations, blood & nerve supply, and lymphatic drainage of ovary.

3. Describe the anatomy of uterine tube.

Breast

It includes the following components:

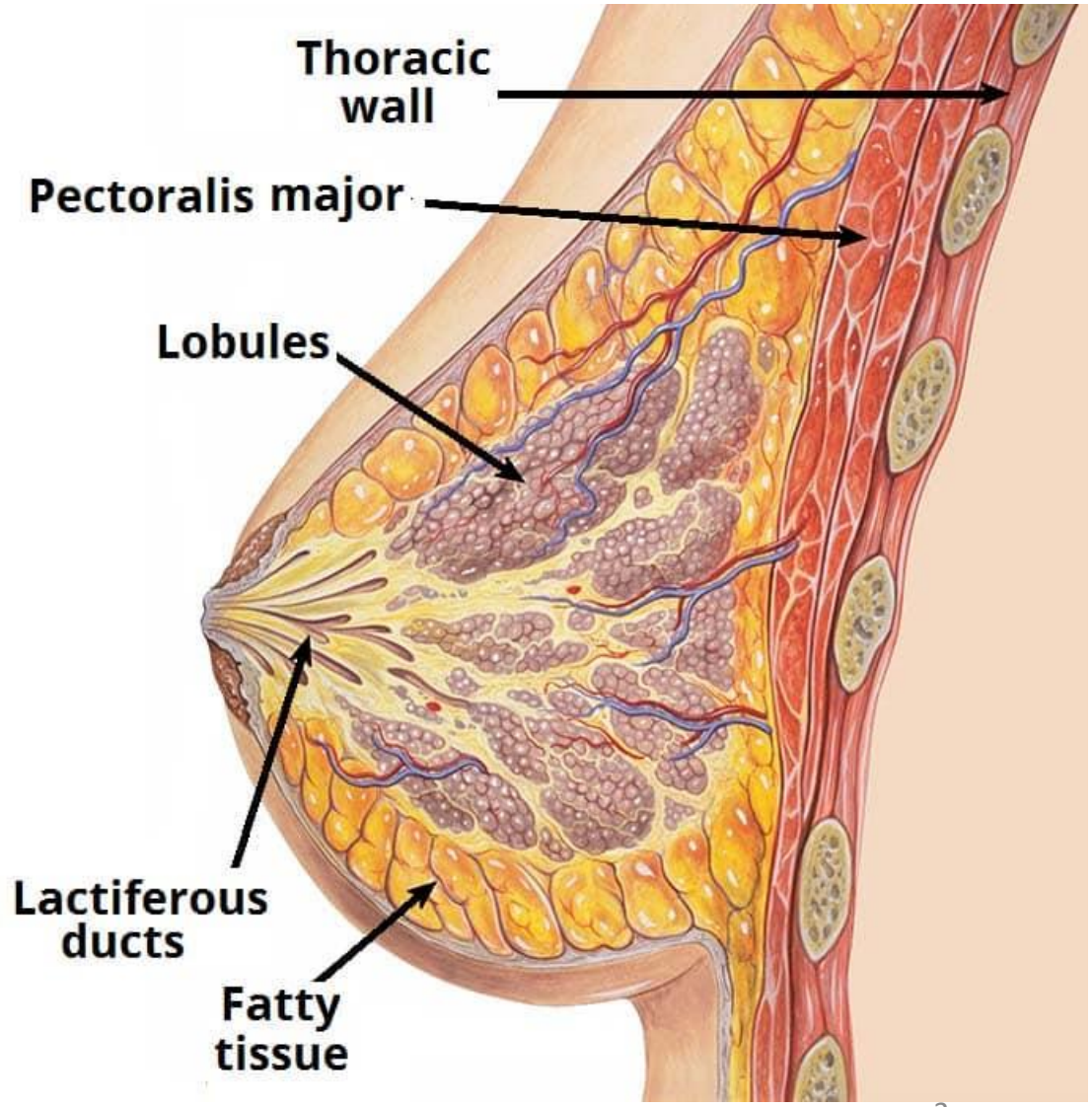
- Mammary gland.
- The superficial fascia that splits to anterior and posterior lamellae to enclose the mammary gland.
- The overlying skin including the nipple and areola.

Sex difference:

- Present in both sexes.
- Rudimentary in male, well developed in female after puberty.

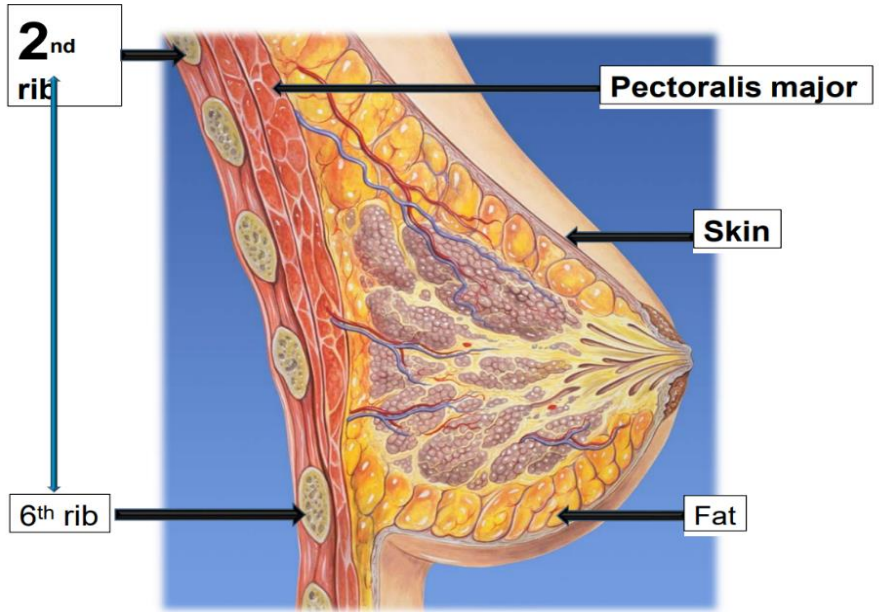
Shape:

- Conical or spherical.



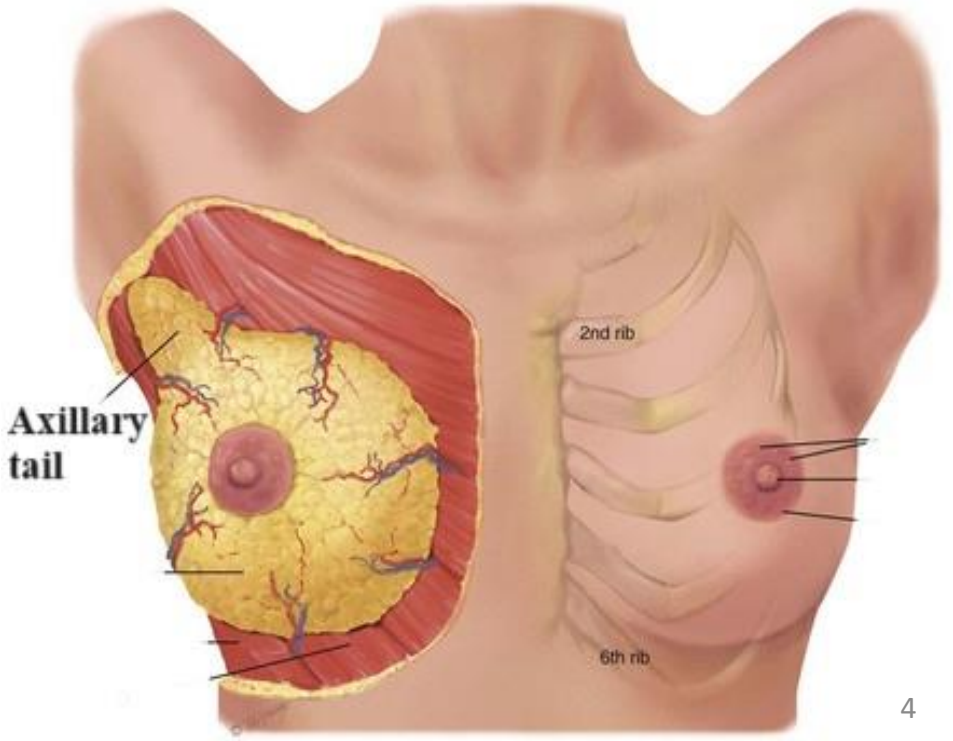
Location and Extent:

- Situated within the superficial fascia of pectoral region.
- It has small extension called axillary tail of breast.



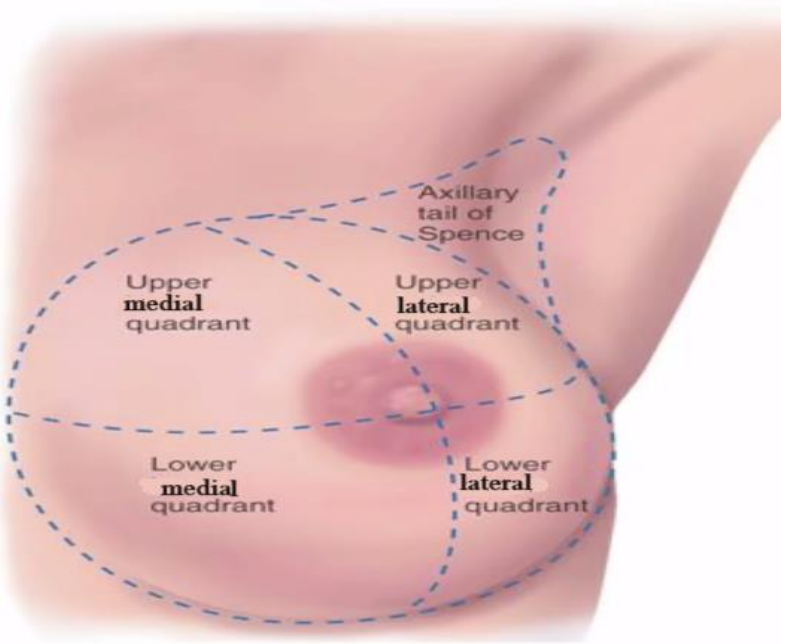
Base of breast Extent:

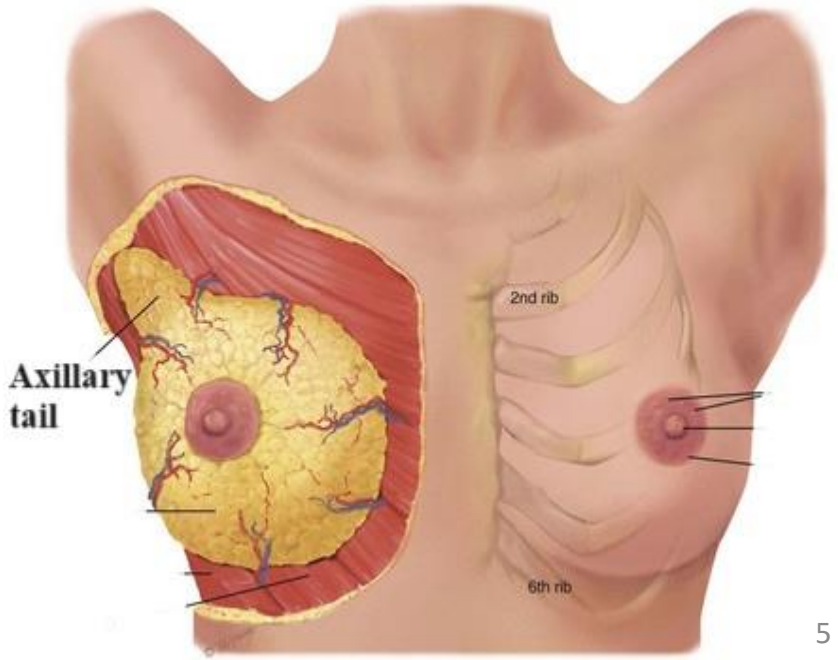
- **Vertically:** 2nd to 6th ribs.
- **Horizontally:** Lateral border of sternum to mid-axillary line.



Axillary tail (axillary tail of Spence):

- It extends upward and laterally from upper lateral part of the gland.
- It passes through an opening in the deep pectoral fascia is known as (foramen of langer) and enters the axilla.

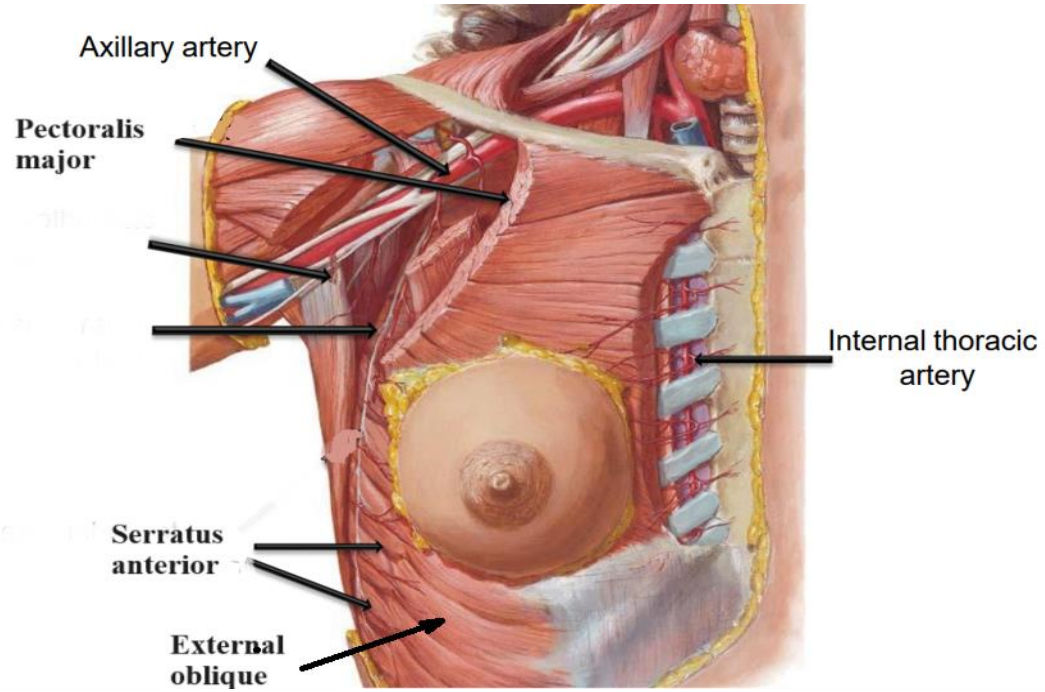


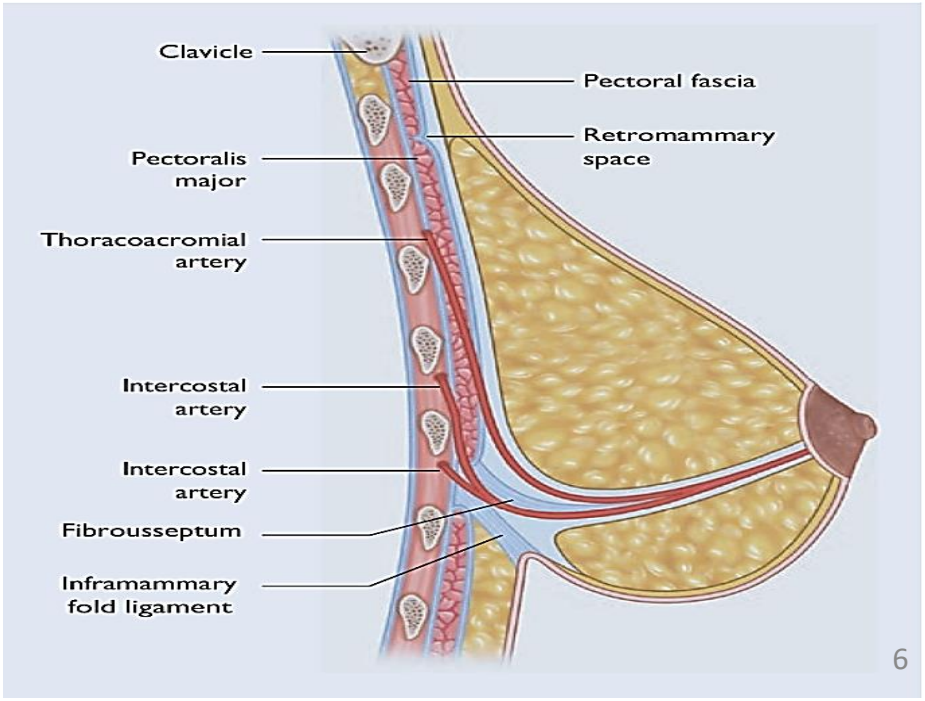


Deep relations of breast (Floor):

Base of breast overlies the following structures:

- **Pectoralis major** with its covering pectoral fascia.
- The breast is separated form pectoral fascia by the loose areolar connective tissue (retro-mammary space), Allowing the free mobility of the breast over the pectoralis major.
- **Serratus anterior** (deep to lateral part).
- **External oblique muscle of the abdomen** (deep to lower part of the gland).





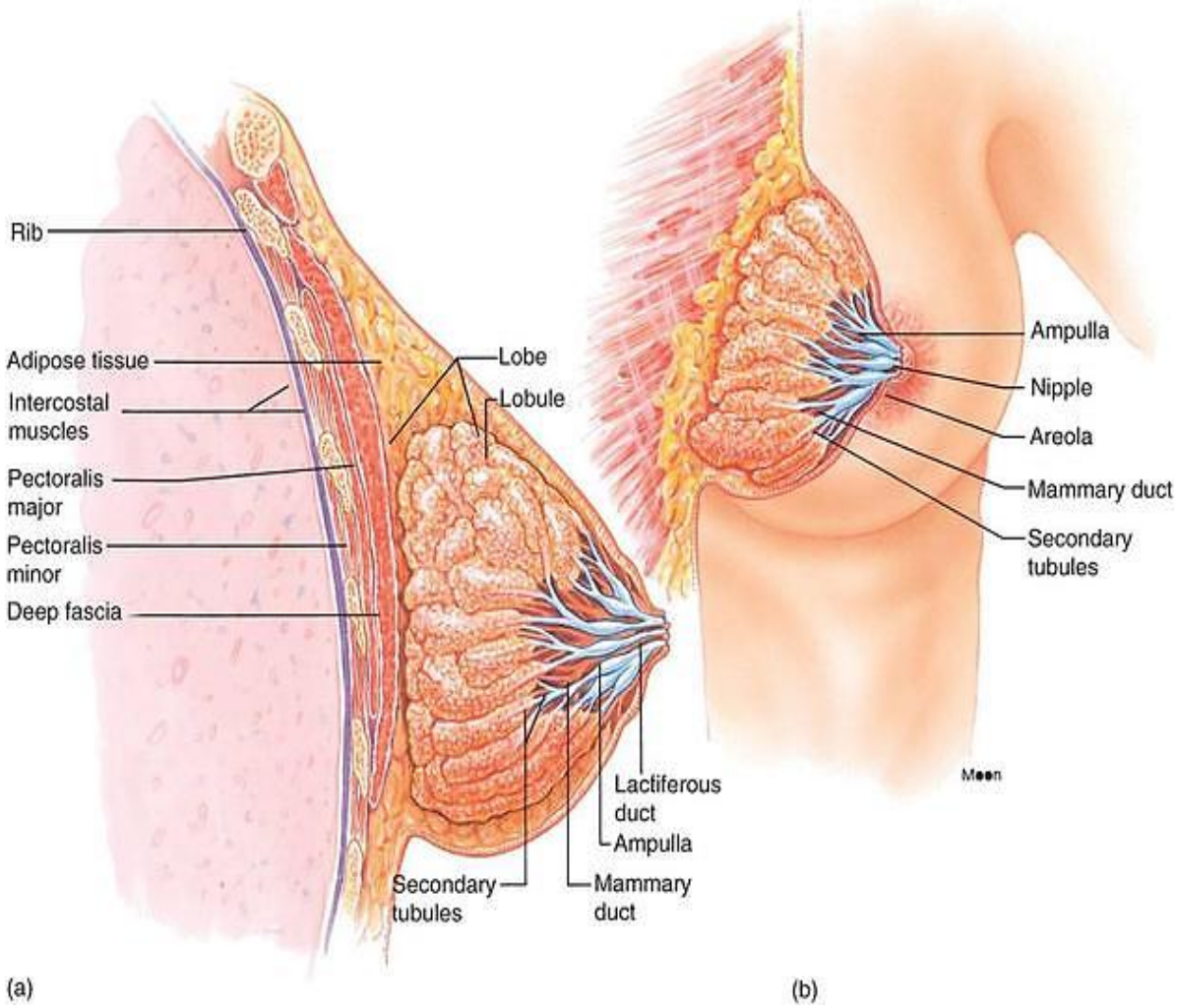
Skin of the breast showing the followings:

The nipple:

- It is conical projection from the centre of the breast.
- **Lies** opposite the 4th intercostal space, just lateral to the midclavicular line.
- It carries the opening of lactiferous ducts (15-20).
- The subcutaneous tissues of nipple is devoid of fat.

Areola:

- Pigmented area of skin that surrounds the base of the nipple.



Structure of Breast:

The stroma:

a)Fibrous stroma:

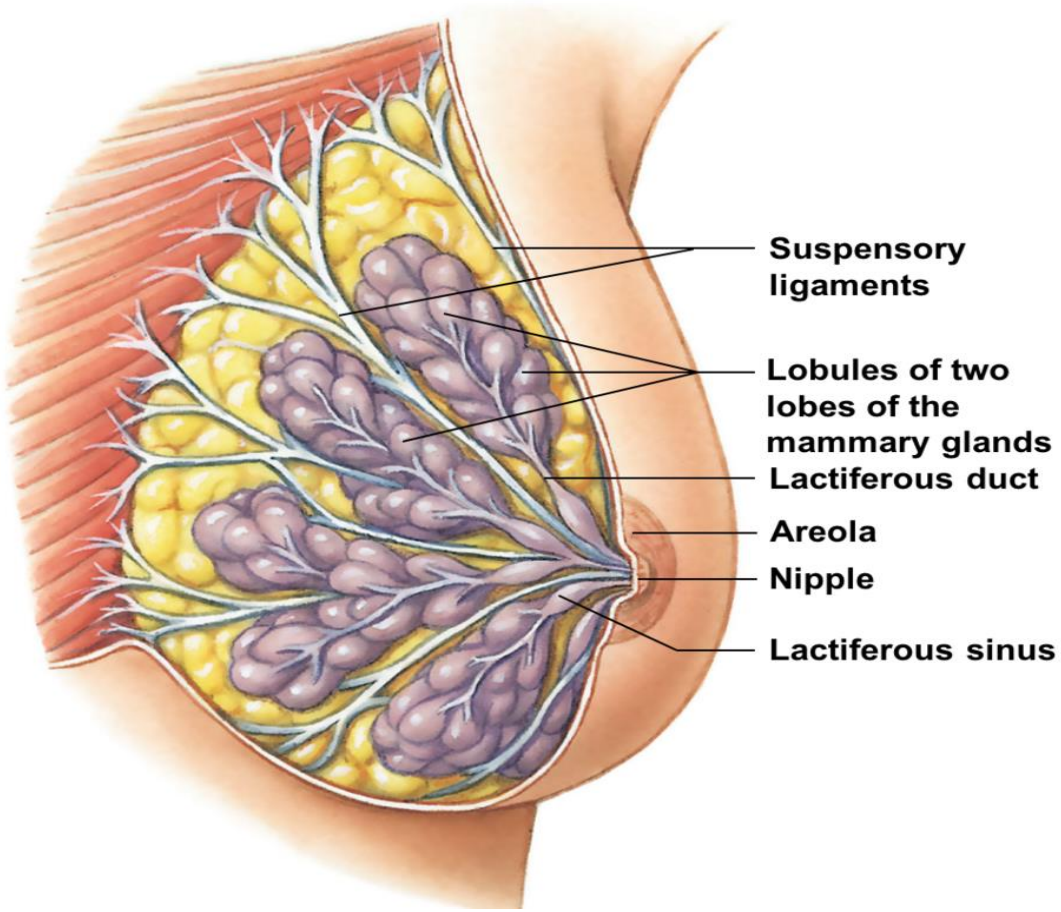
- Forms fibrous septa known as **suspensory ligaments of Cooper**, divide the gland into lobes.

b) Fatty stroma:

- Forms the main bulk of the gland.

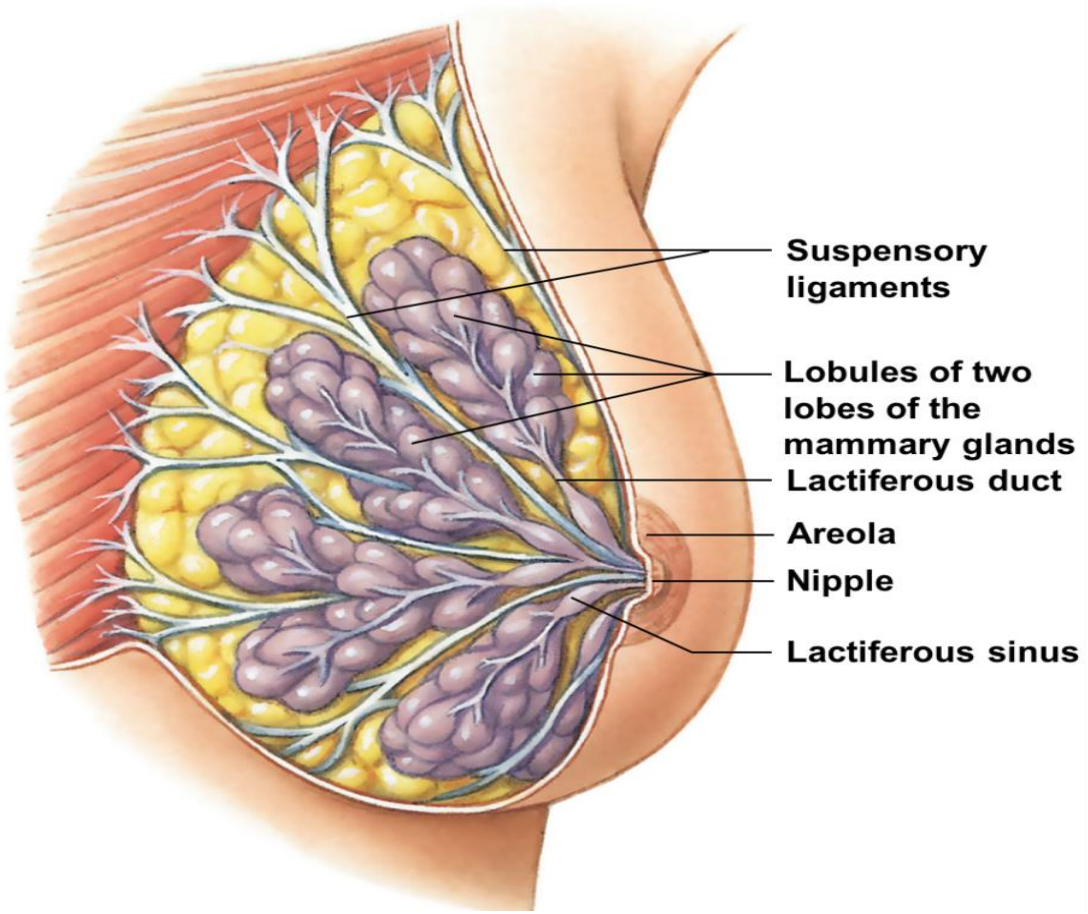
Parenchyma (Mammary gland):

- Each mammary gland consists of 15–20 lobes of glandular tissue.
- Each lobe has a lactiferous duct.
- Each lactiferous duct dilates under the areola to form lactiferous sinus and then opens on the nipple.



Suspensory Ligament of Cooper:

- Run throughout the breast tissue from the pectoral fascia and attach to the dermis of the skin.
- Relax with age and time, eventually resulting in breast ptosis.



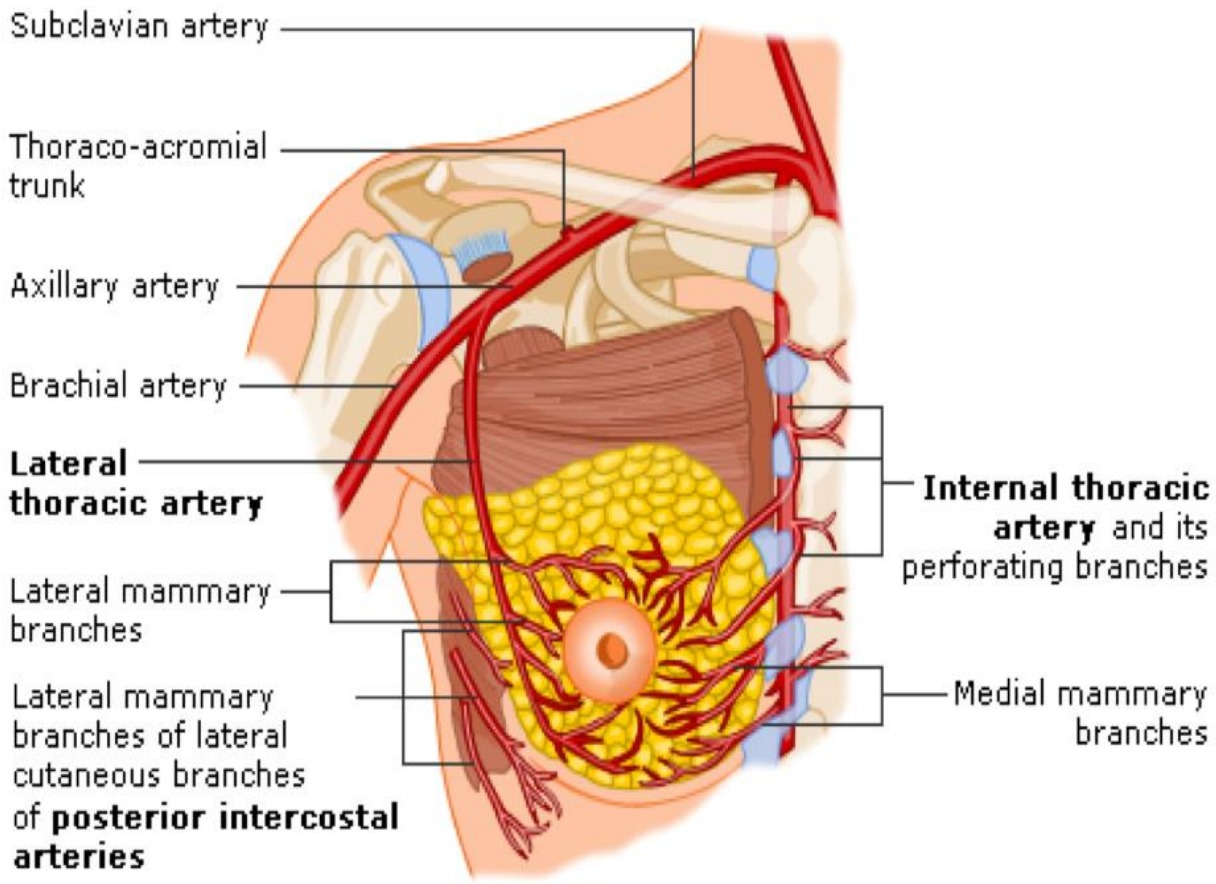
Arterial Supply of Breast:

- **Axillary artery** through:

Lateral thoracic artery (supply the lateral aspect of the breast).

- **The perforating branches of internal thoracic artery** to the anteromedial part of the breast.

- The perforating branches of second to fourth anterior intercostal arteries.



Venous drainage of Breast into:

- Axillary, internal thoracic and intercostal veins via veins that accompany the corresponding arteries.

- Intercostal veins communicate with the vertebral veins. This route is responsible for metastasis of breast cancer to vertebral bodies.

The breast is innervated by:

- **Fourth to sixth** intercostal nerves, by their anterior & lateral cutaneous branches.
- Secretory activities of the gland are largely controlled by prolactin & ovarian hormones.

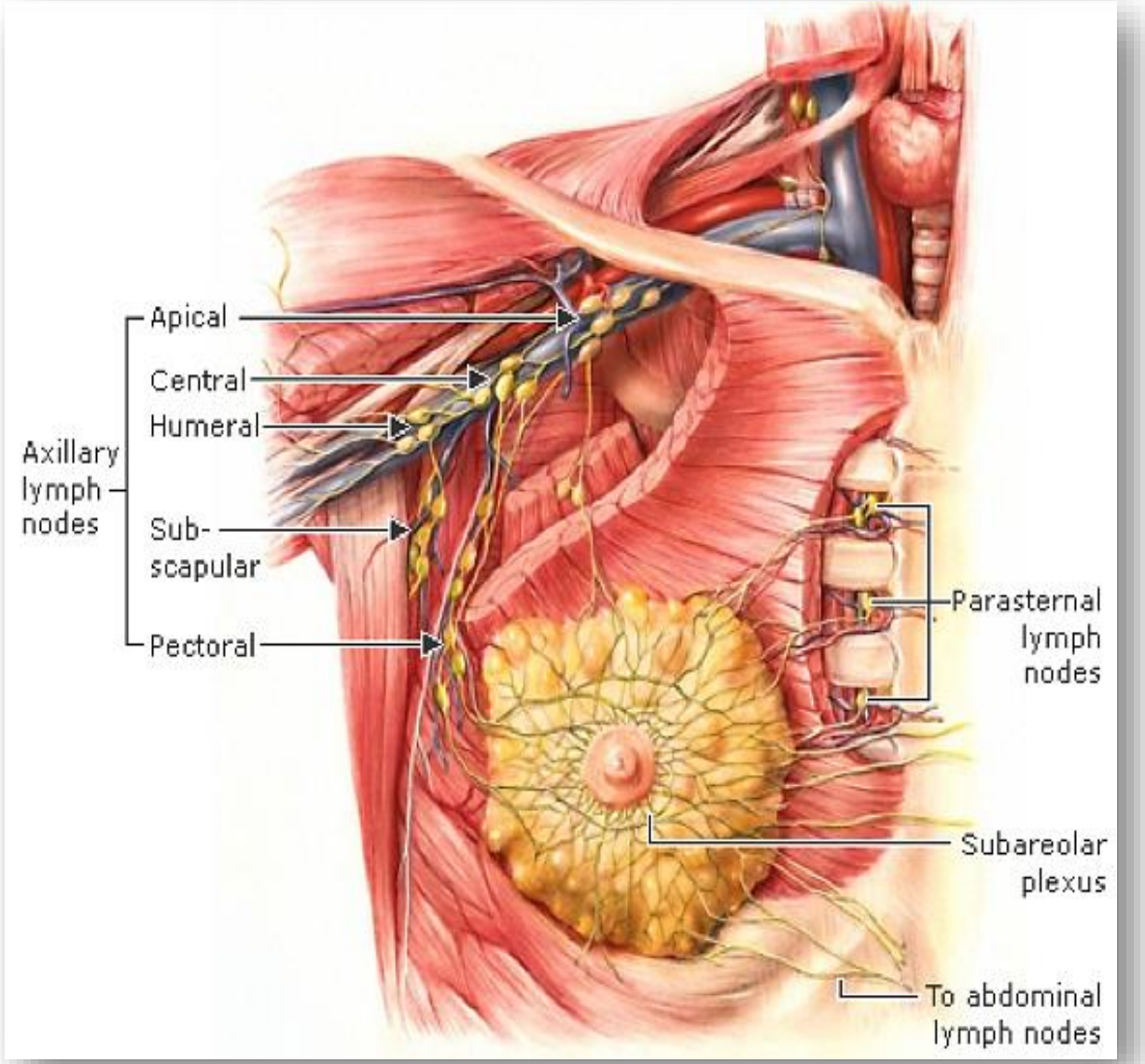
Lymphatic drainage of breast:

Lymphatic vessels:

- **Subcutaneous plexus.**
- **Subareolar plexus of Sappey drain nipple &**areola.
- Parenchymatous plexus.
- Submammary plexus.

Lymph node station:

- **Axillary nodes** receive 75% -85% of the lymph from the breast.
- **Internal mammary (parasternal) nodes (10-20 %)**.
- **Others (5%):** as posterior intercostal, subdiaphragmatic….

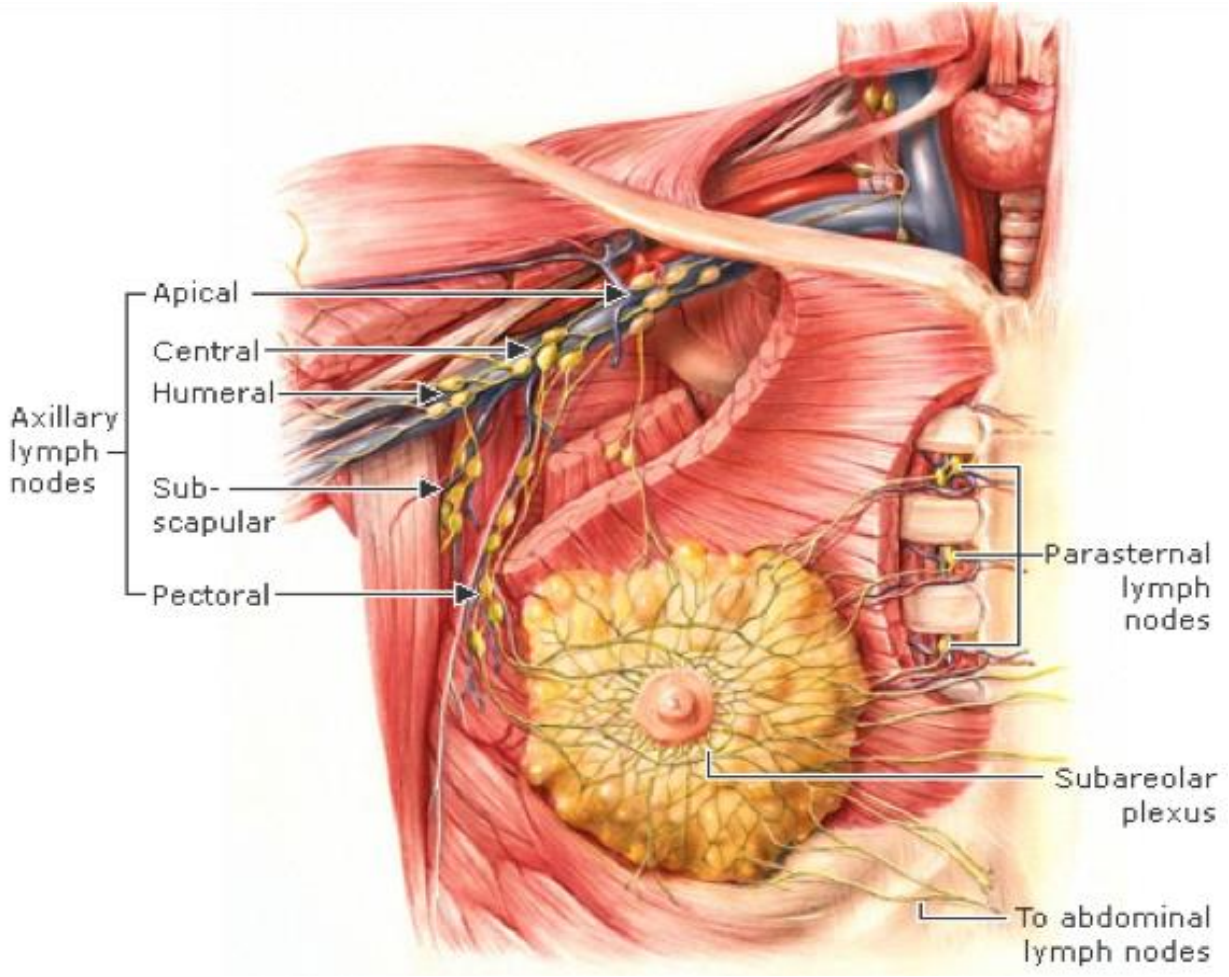


Lymphatic drainage according to the part of breast:

- **Nipple &areola** drain into the **pectoral and apical group of axillary lymph nodes.**

- **Upper lateral quadrants** drains into **apical group of axillary lymph nodes.**

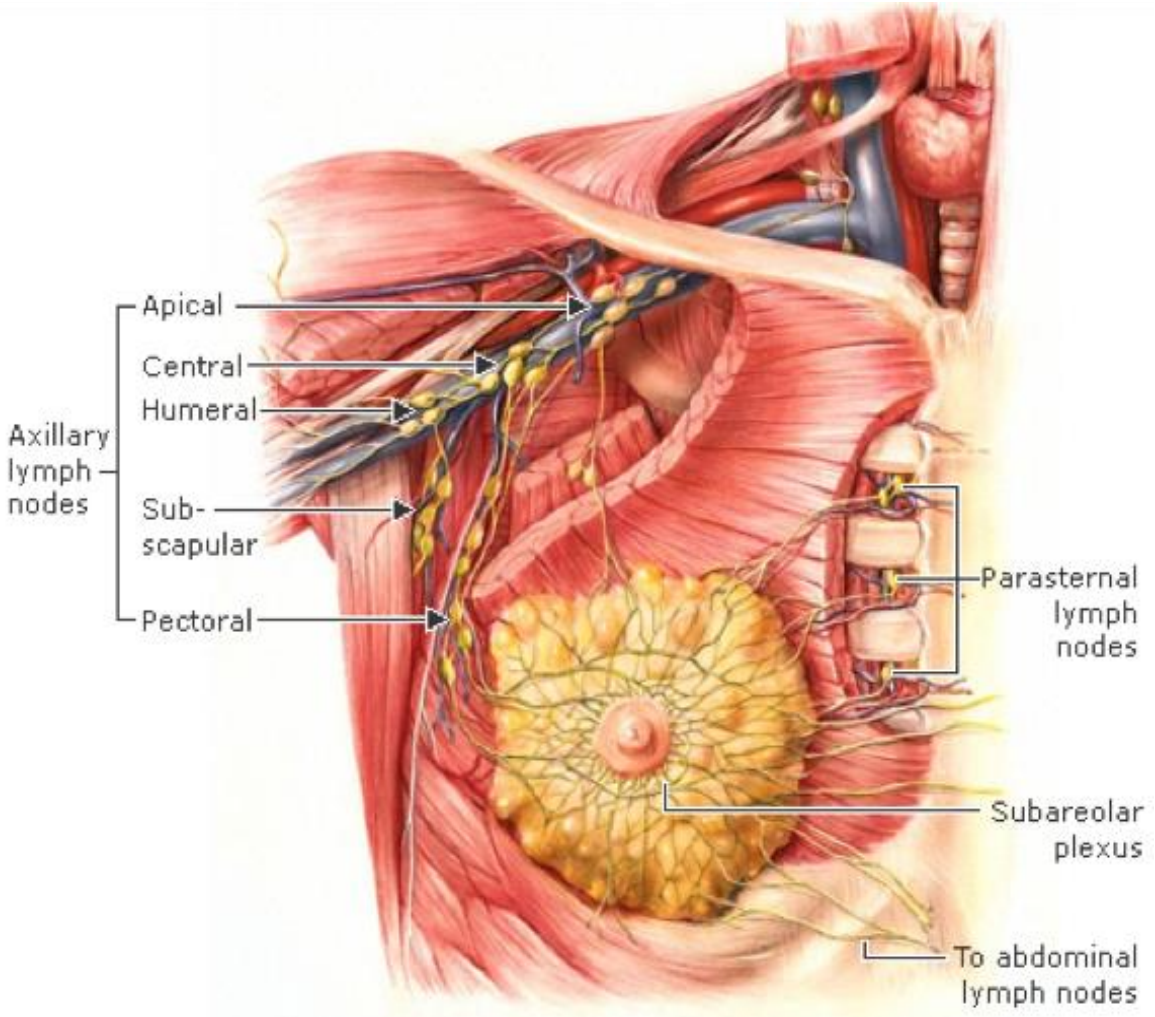
- **Lower lateral quadrant drain into the pectoral group of axillary nodes** (situated just posterior to the lower border of the pectoralis major muscle).



- **Upper medial quadrant** the lymphatic vessels that pierce the intercostal spaces and **drain into internal mammary lymph nodes** (situated within the thoracic cavity along the course of the internal thoracic artery).

- Lymphatics from **the lower medial quadrant** of the breast anastomose with the lymphatics of the rectus sheath and sub-diaphragmatic lymphatics.

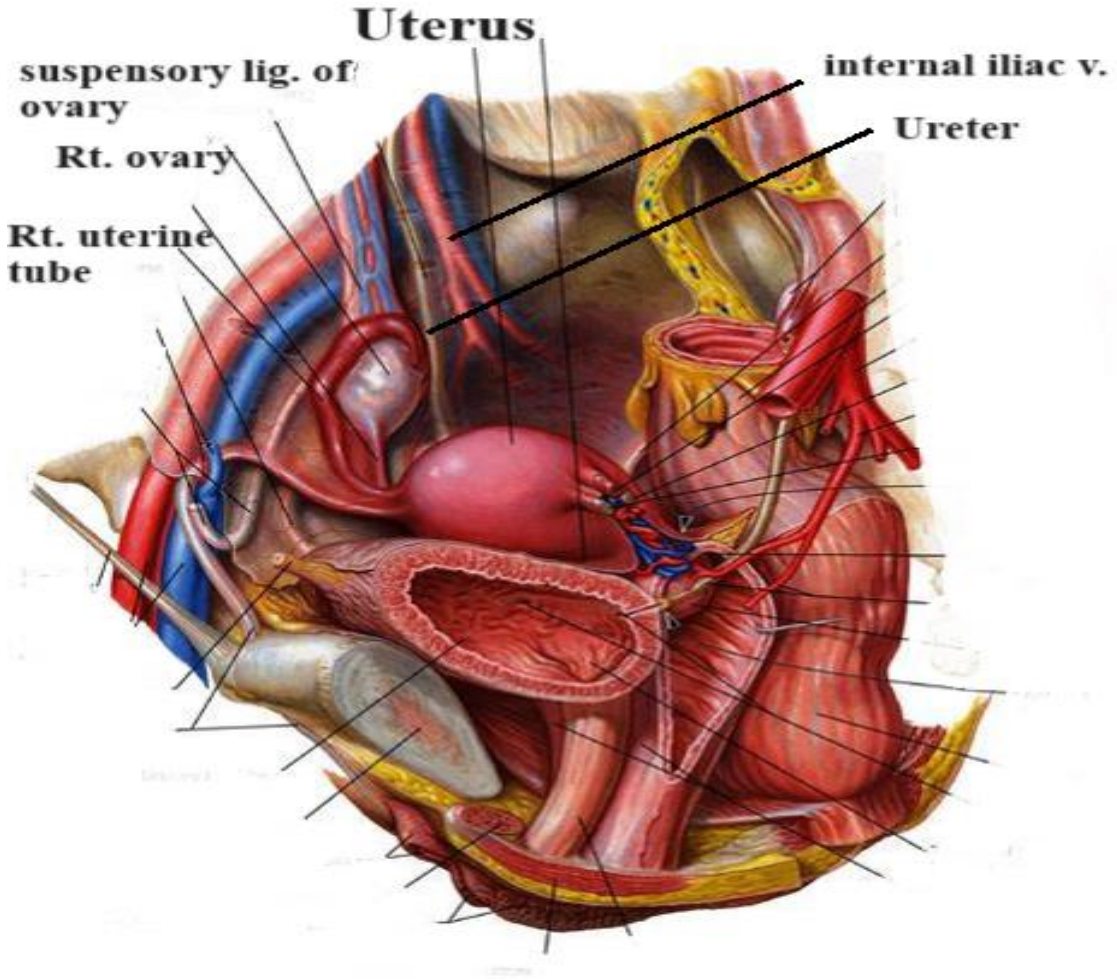
- Lymphatics vessels from the **medial part** of the gland also **cross the midline to anastomose with the lymphatics of the opposite breast.**



Ovaries

Site:

- The ovaries, one on each side, It lies in a depression, called the **ovarian fossa** at the lateral pelvic wall.
- During pregnancy, the enlarging uterus pulls the ovary up into the abdominal cavity.

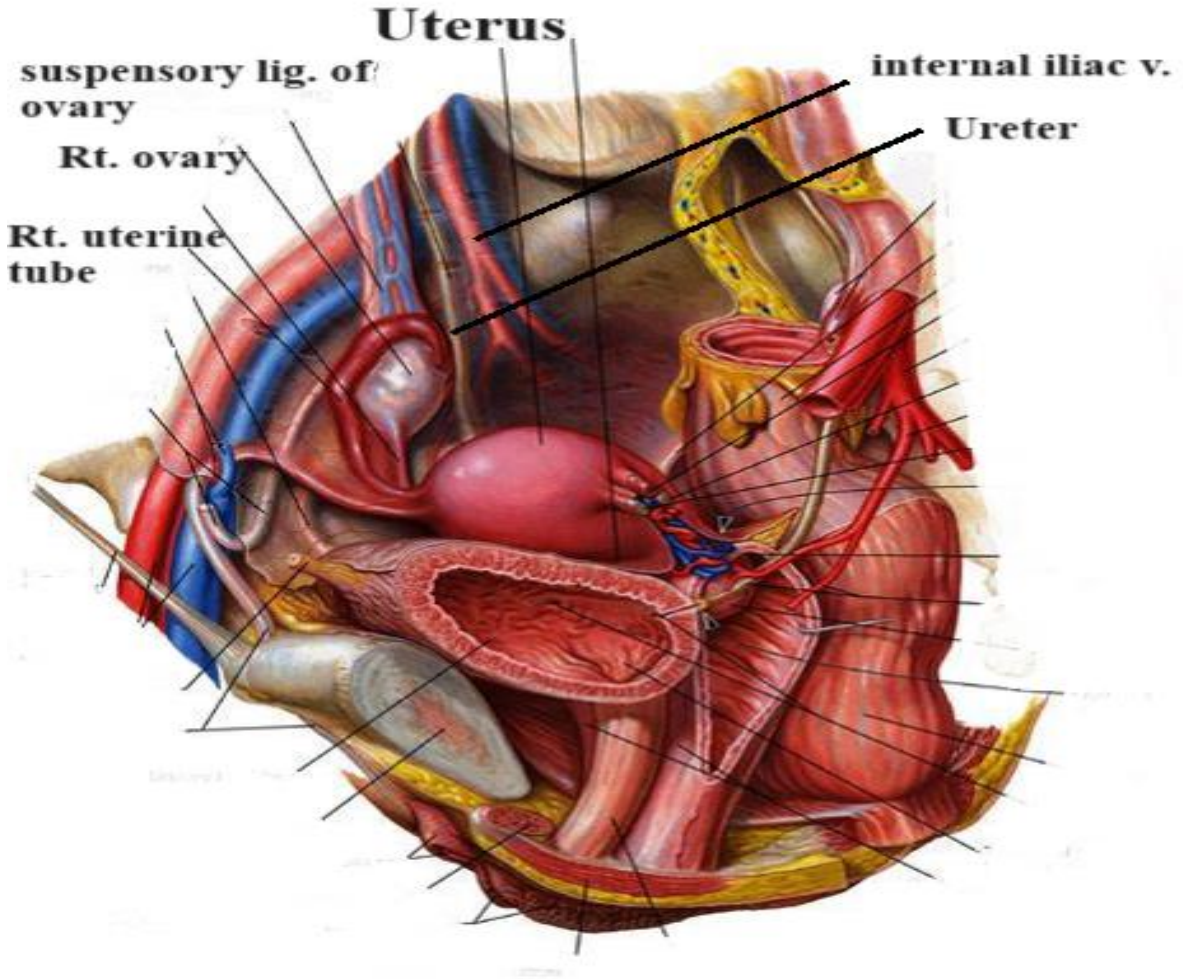


Boundaries of ovarian fossa:

- **Anterior:** External iliac vessels.
- **Posterior:** Ureter and internal iliac vessels.
- **The floor of the fossa:** Formed by the obturator internus and obturator fascia.

Shape and size:

- Ovary is an almond-shaped organ.
- **Its dimensions**; 3×2×1 cm.



Description: It has

- **Two surfaces**; Medial & Lateral.
- **Two ends**; Upper &Lower.
- **Two borders**; Anterior & Posterior.

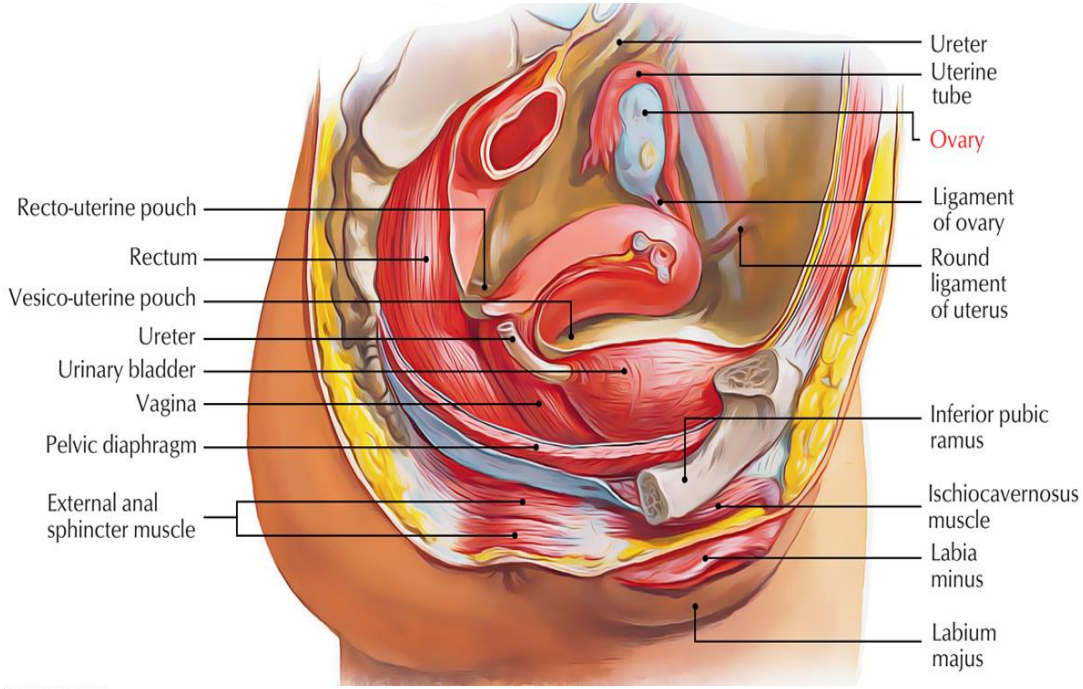
Surfaces of the ovary:

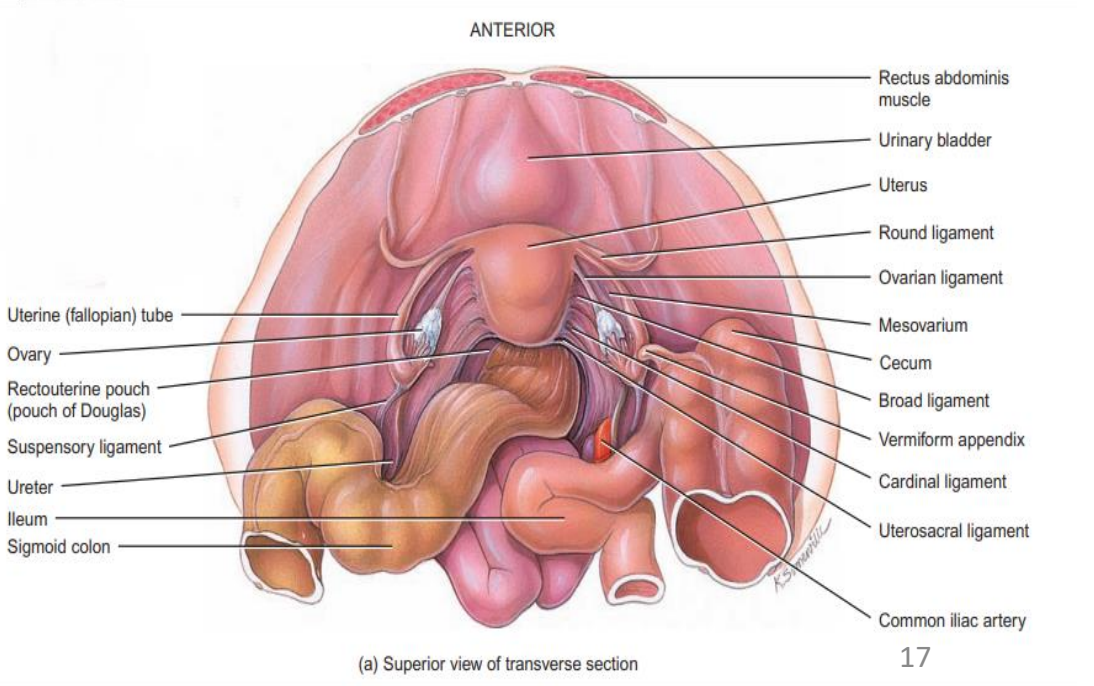
a-The lateral surface:

- It is related to the parietal peritoneum of the ovarian fossa, which separates the ovary from obturator muscle and fascia.

b-The medial surface:

- It faces the uterus.





(a) Superior view of transverse section

Ends of the ovary:

a-The upper or tubal end of the ovary:

- It is related to the fimbria of the uterine tube.
- It is related to **the suspensory ligament of the ovary**.

b-The lower or uterine end:

- It gives attachment to the **ligament of the ovary.**

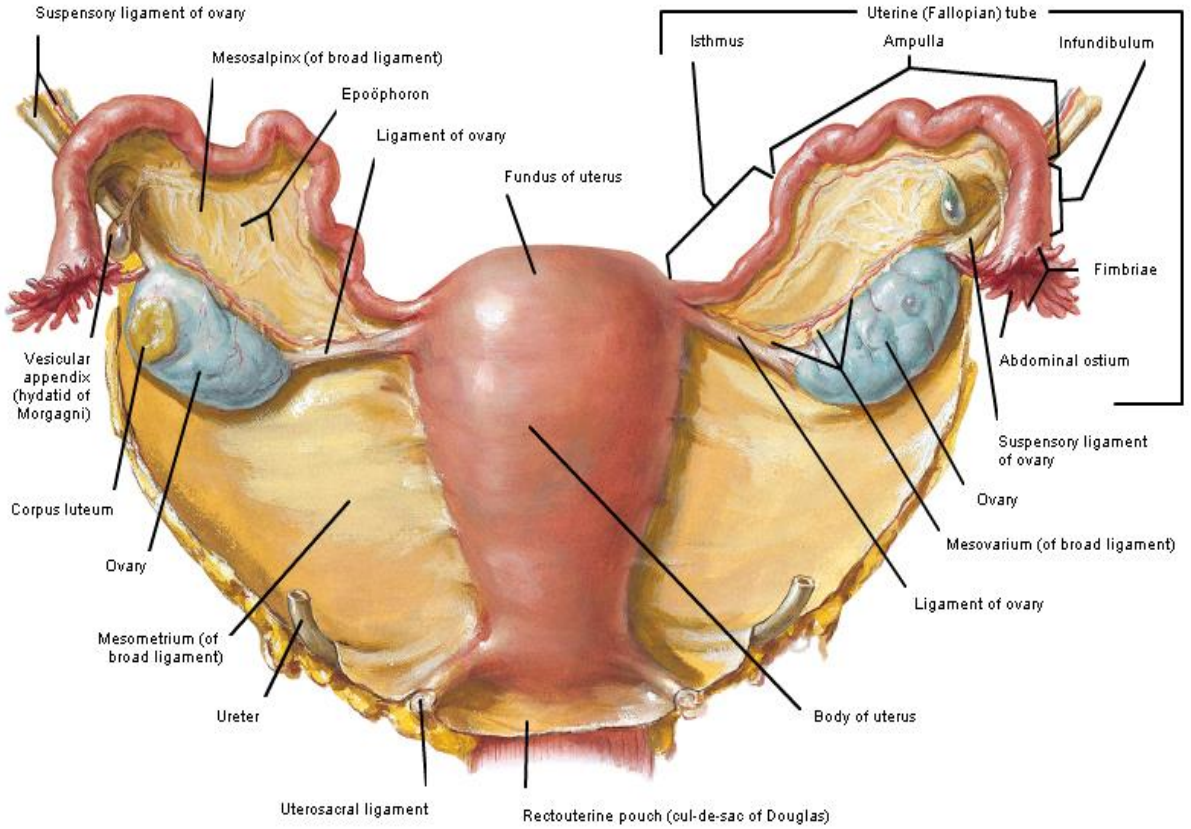
Borders of the ovary:

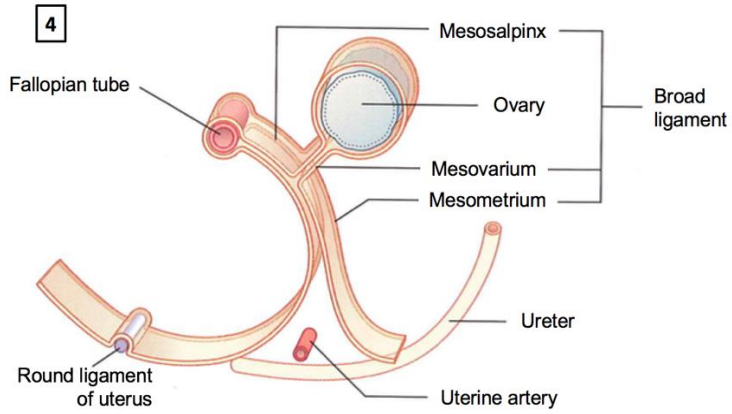
a-Posterior (free) border:

- It is toward the ureter.

b-Anterior (attached) border:

- It is attached to the **mesovarium.**





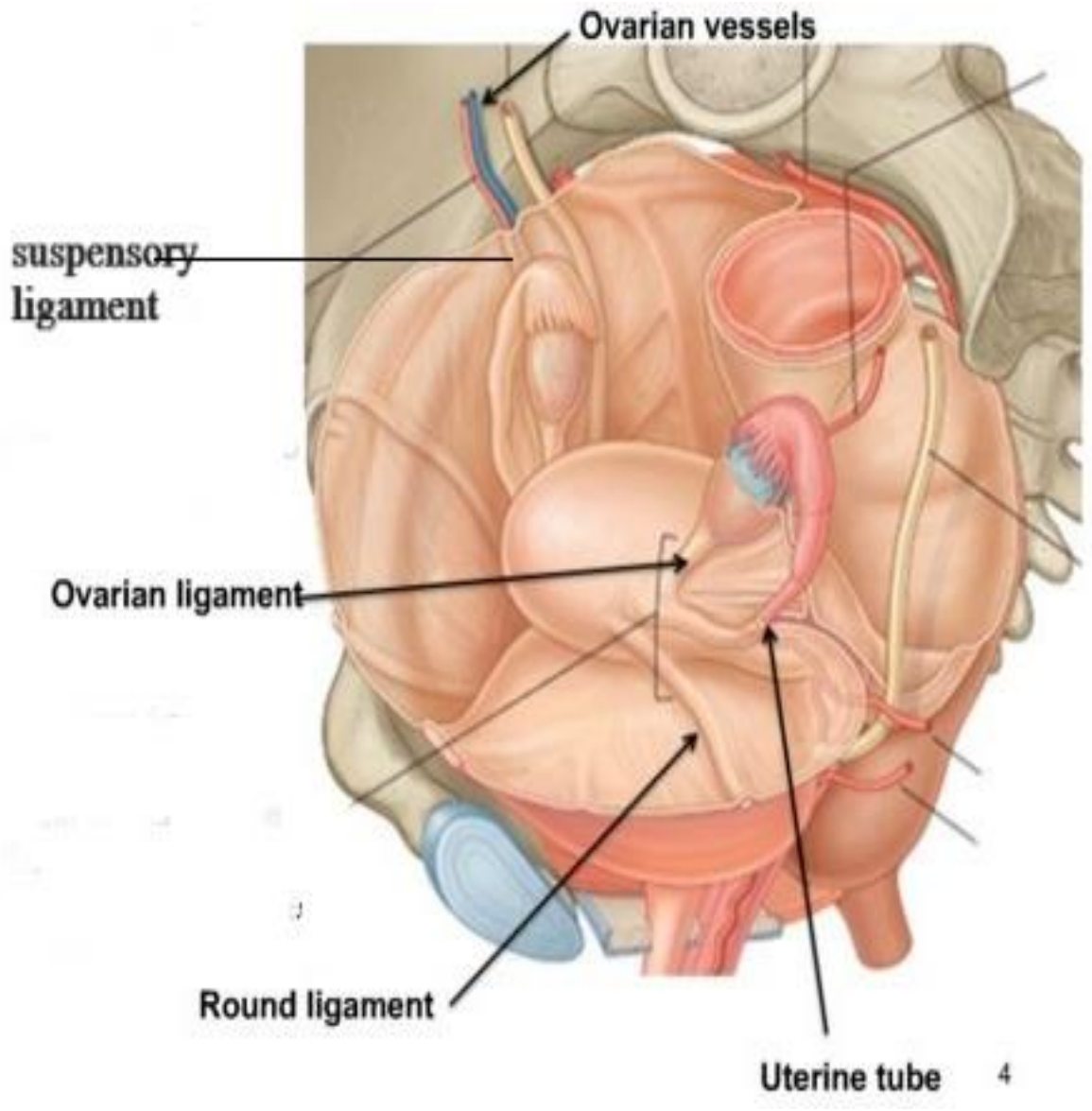
Peritoneal relation of the ovary:

- The ovary is almost completely covered by peritoneum.
- The peritoneal covering is perforated by the ovum during the ovulation.

Ligaments of ovary:

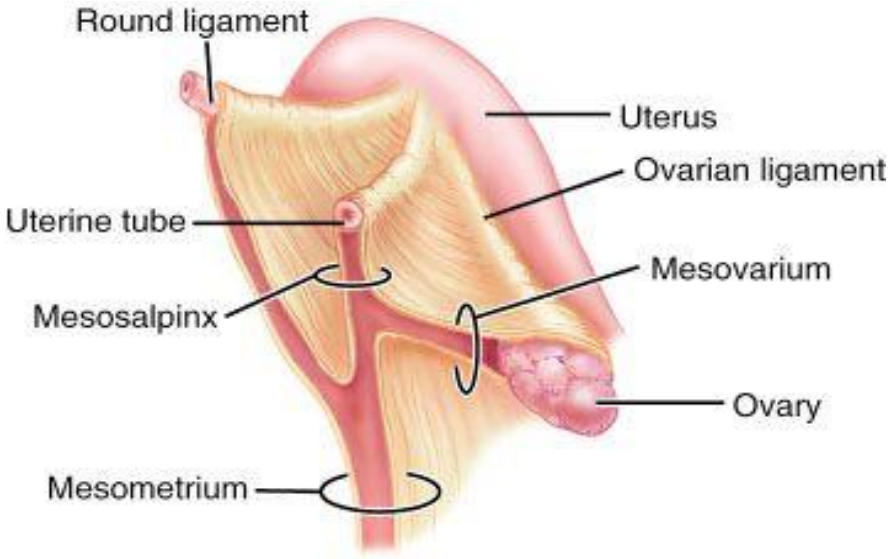
1- Suspensory ligament of the ovary:

- It is **part of** the broad ligament.
- It **extends from** the upper end of the ovary to the side wall of the pelvis.
- It **transmits** the ovarian vessels, nerves and lymphatics.



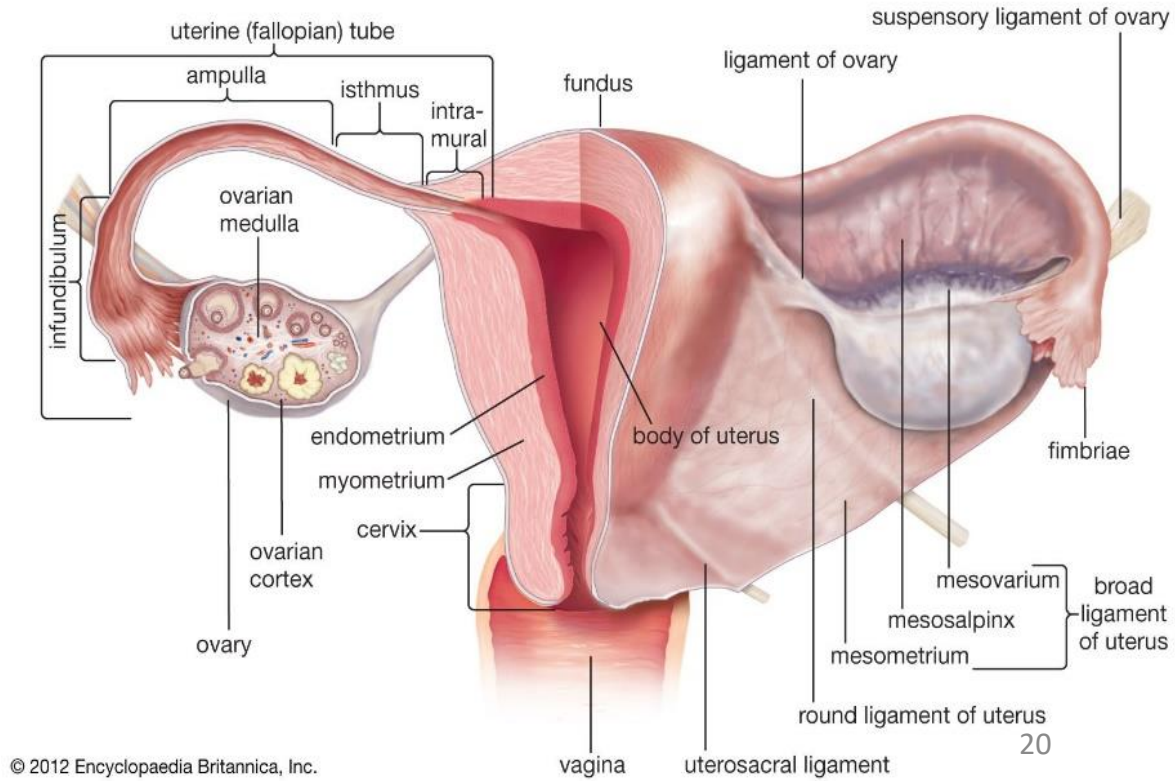
2-Mesovarium:

- It **is a peritoneal fold extending** from the broad ligament to the anterior border of the ovary.
- It **transmits** the ovarian vessels and nerves to the ovary.



3-Ovarian ligament:

- It is a fibromuscular cord extending from the uterine end of the ovary to the lateral angle of the uterus.



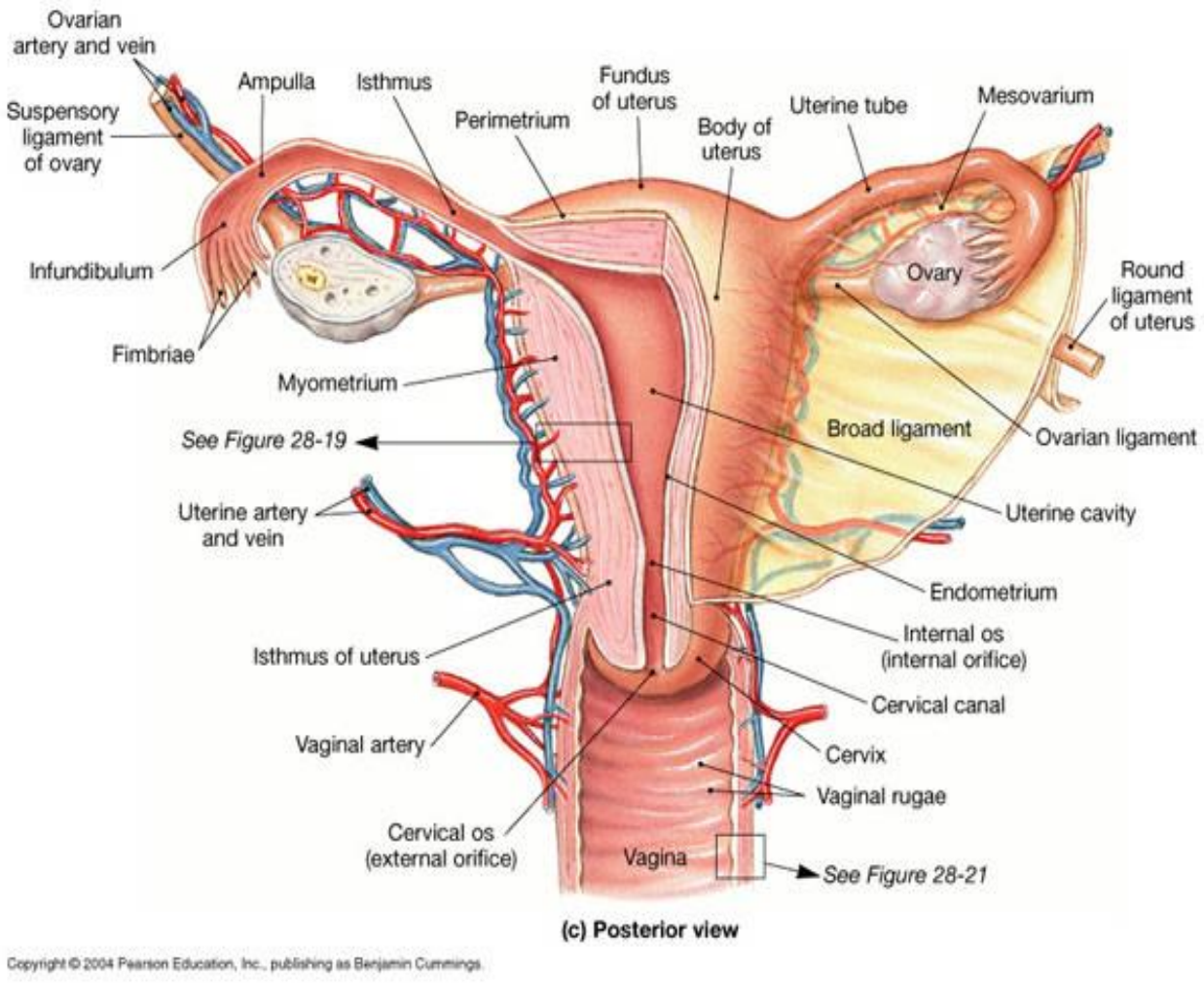
Arterial supply of ovary:

a-Ovarian artery:

- It reach ovary through the suspensory ligament and mesovarium.

b-Uterine artery:

- It gives additional branches which reach the ovary through the mesovarium.



Venous drainage:

- Ovary drains into the pampiniform plexus which drains into the ovarian vein.
- Ovarian veins drain into the inferior vena cava on the right side and to the left renal vein on the left.

Lymphatic drainage:

- Para- aortic lymph nodes.

Nerve supply:

- Sympathetic fibers are derived from 10^{th} and 11^{th} thoracic segment.
- Parasympathetic fibers from pelvic splanchnic nerve.

Uterine tubes (Fallopian tubes)

It is also called **salpinx.**

Length: It is about 10 cm long.

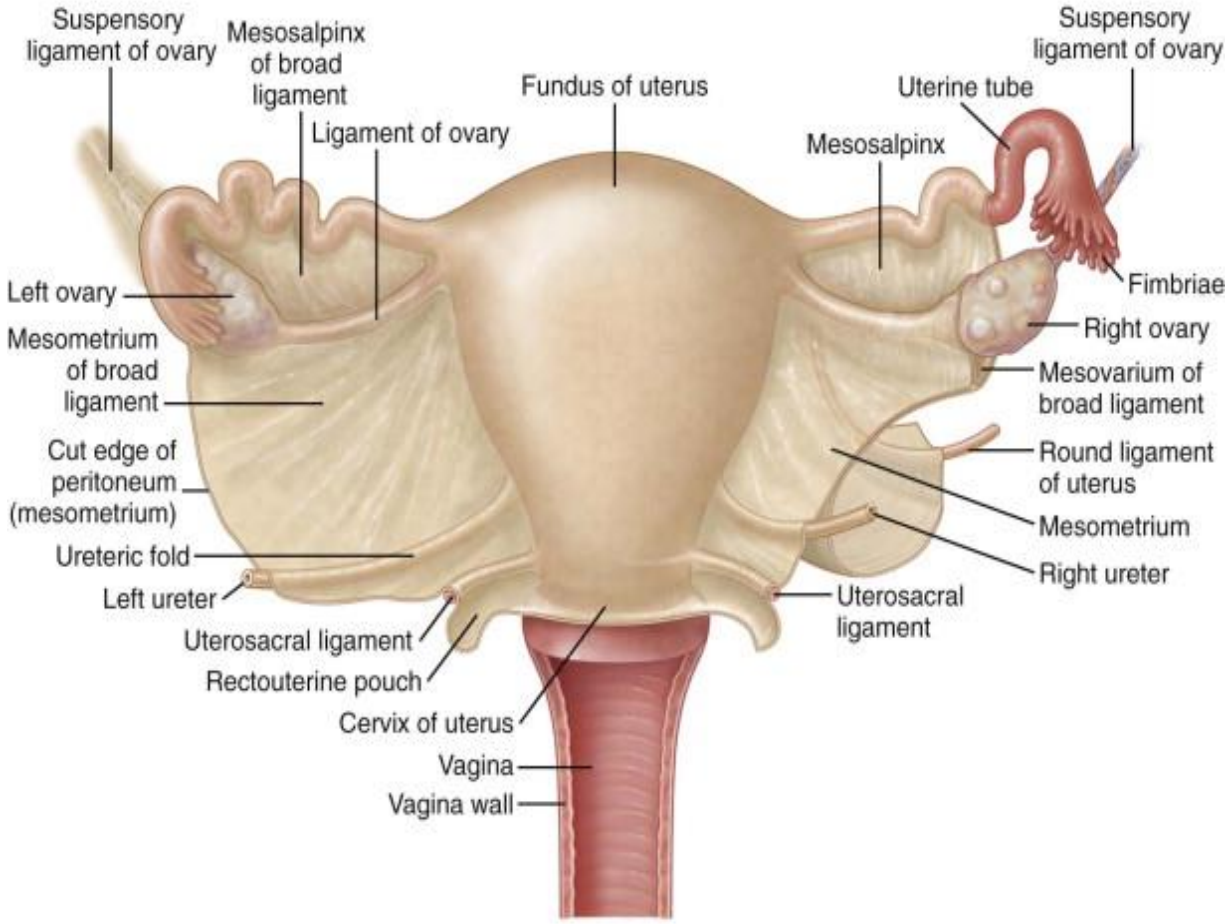
Site: It lie in the free anterior borders of the broad ligament.

Ends:

Each tube has two ends:

- **The medial end** (uterine ostium)**:** It opens at the superior angle of the uterine cavity.

- **The lateral end** (abdominal ostium): It opens into the peritoneal cavity in the region of the ovary.



Uterus and broad ligament (posterior view)

Course &parts of uterine tube:

It passes laterally and superiorly.

It consists of four main parts from medial to lateral:

1-Intramural part (uterine part): (1cm long)

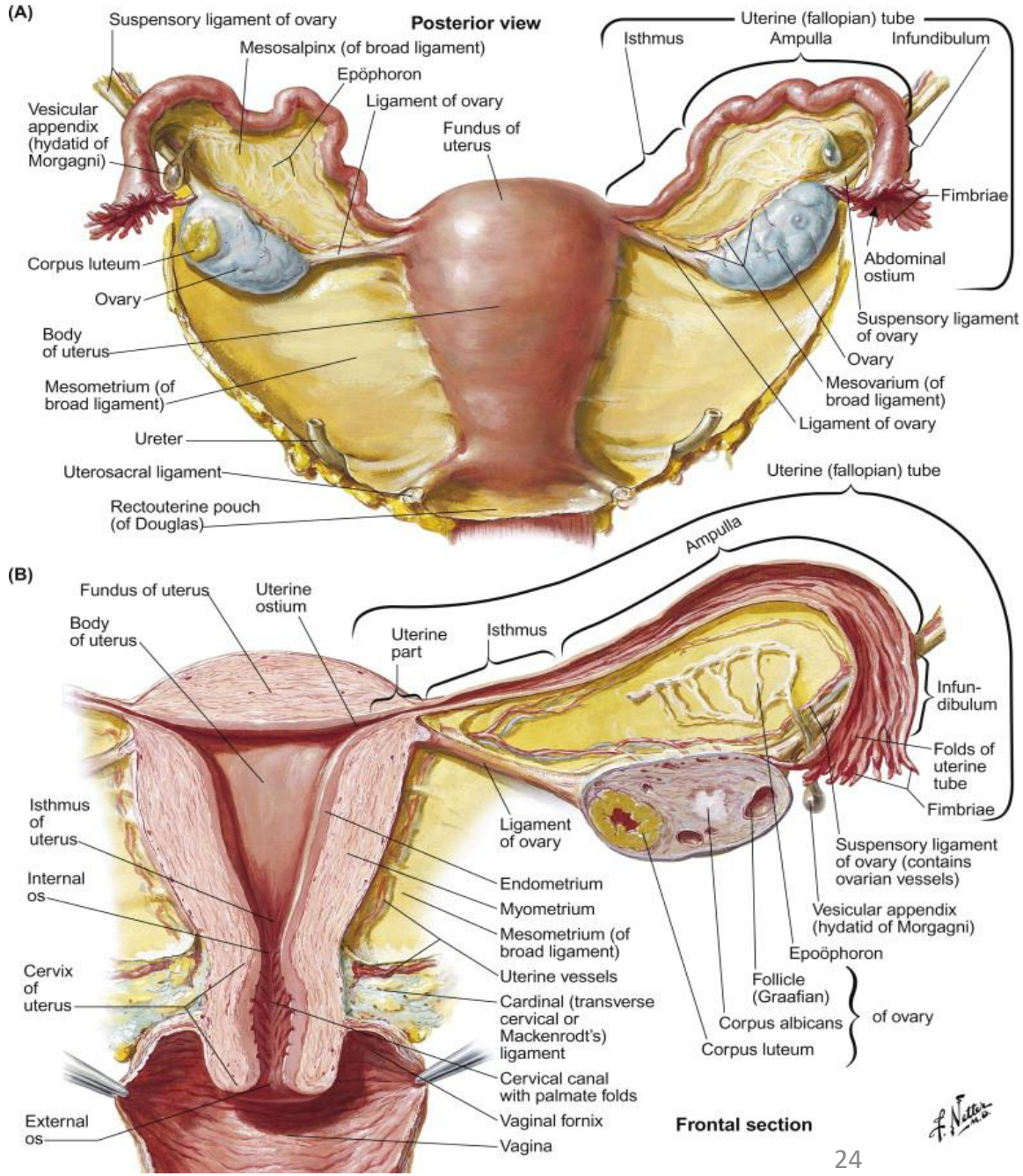
- It lies within the myometrium- the narrowest part.

2-Isthmus: (3cm)

- It is narrow part & has thick wall.

3-Ampulla: (5cm)

- The widest portion& has thin wall.
- The fertilization takes place in its lumen.
- It opens into the infundibulum at the abdominal ostium.

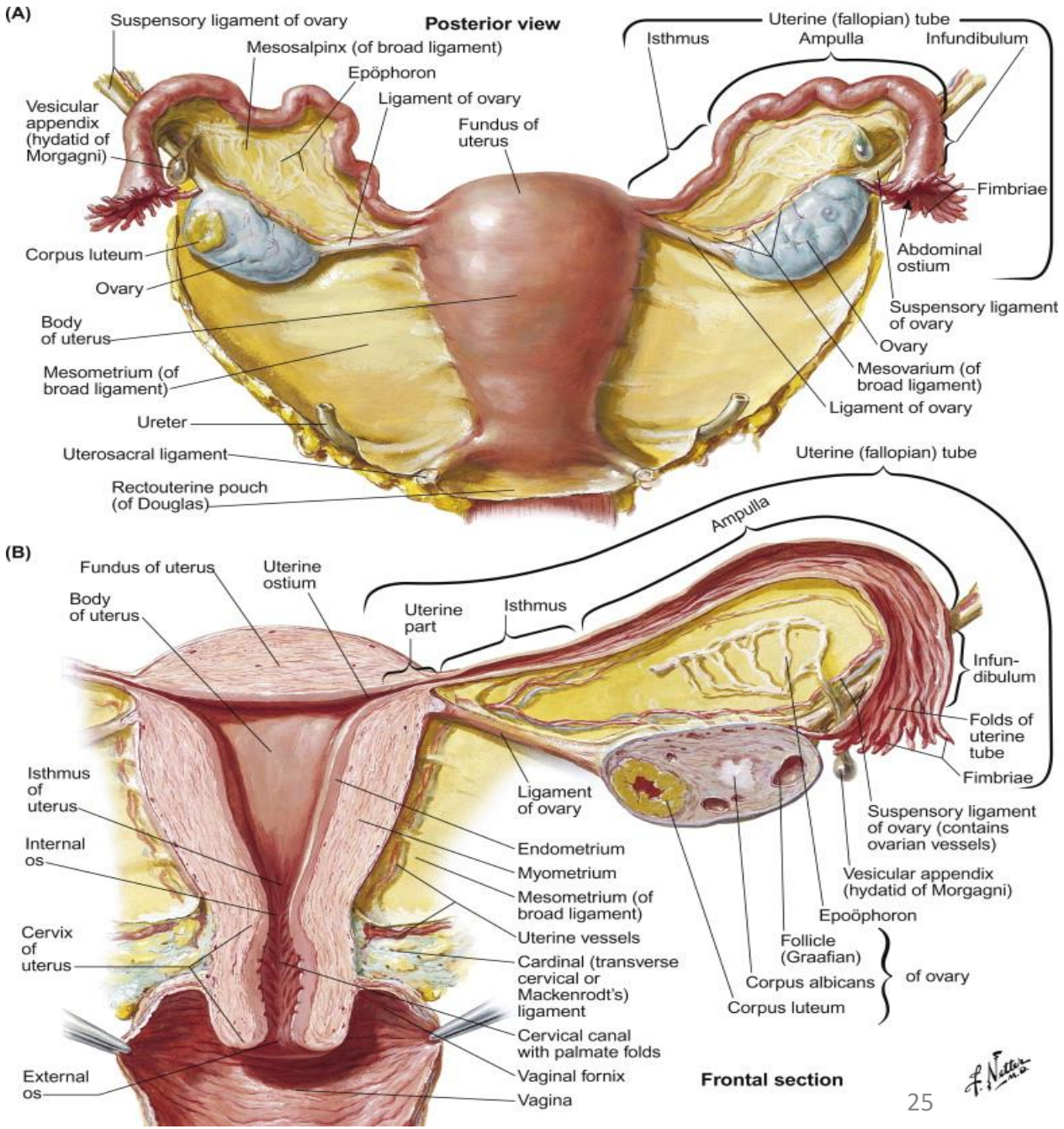


4-Infundibulum& fimbriae: (1 cm)

- Infundibulum is a funnel-shaped part.
- Fimbriae, numerous mucosal finger-like folds, are attached to the ends of the infundibulum (extend from its inner circumference beyond the muscular wall of the tube).

Peritoneal relations:

- The part of the broad ligament between the tube and ovarian ligament is called **mesosalpinex.**
- The mesosalpinex contains the anastomosis between ovarian and uterine arteries.



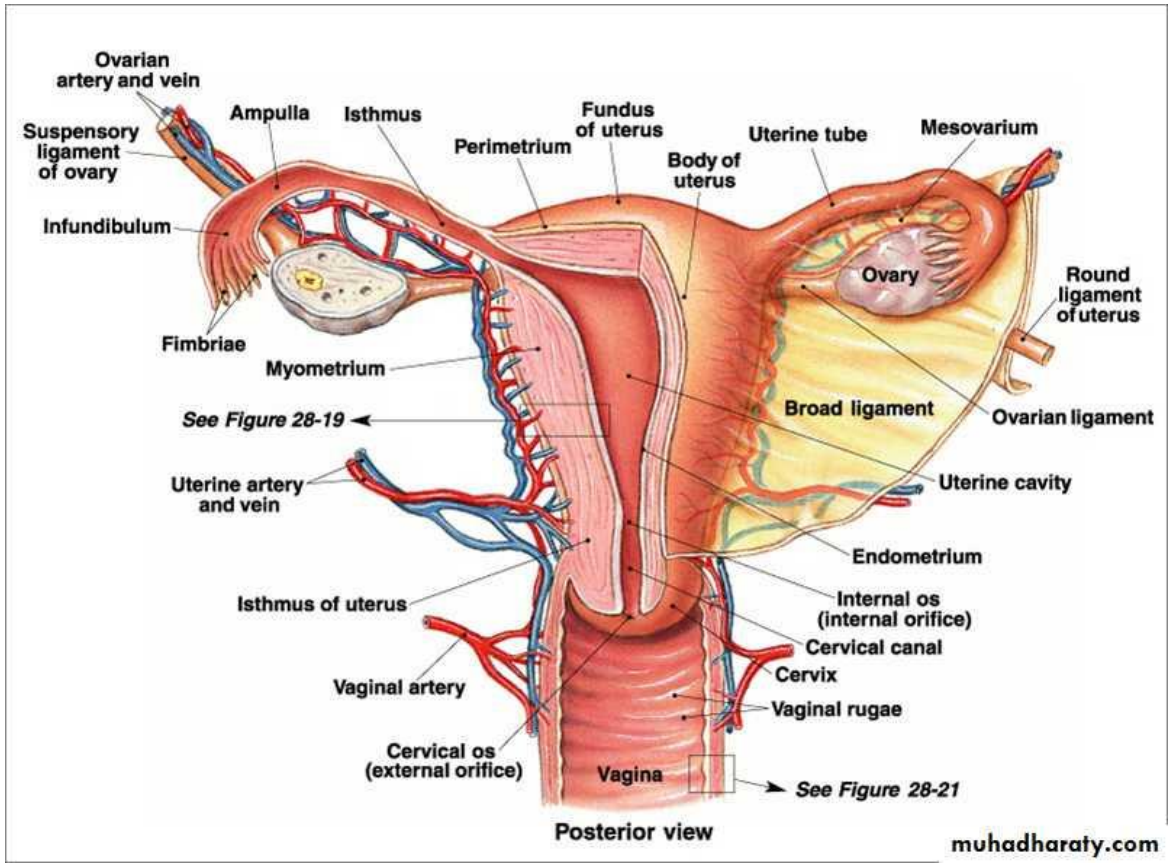
Arterial supply:

By branches from the uterine artery & ovarian artery.

Lymphatic drainage:

Para-aortic nodes and internal iliac nodes.

- The tube is common site for ectopic pregnancy which is usually rupture during 2nd trimester causing hemorrhage in the abdominal cavity.

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