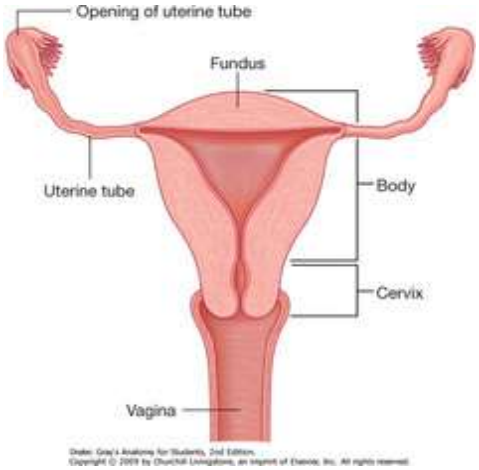
FEMALE REPRODUCTIVE SYSTEM

ENUMERATE PARTS OF UTERUS(SE)

Parts of uterus: from above downwards



Fundus -part which lies above the openings of uterine tube

Body- Extends from fundus to isthmus

Cervix -Situated below isthmus

2 parts of cervix:

Supravaginal part

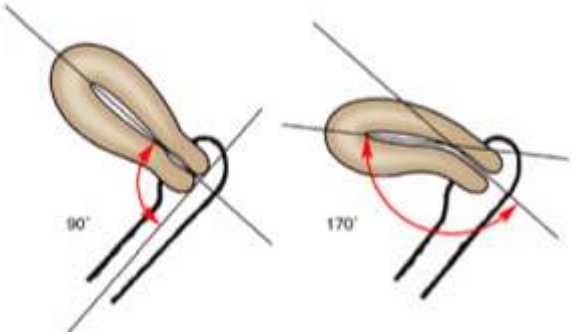
Vaginal part

POSITION AND PARTS OF UTERUS(SE)

Uterus is situated in the true pelvis between urinary bladder and rectum normal position of uterus shows 2 angles – anteversion & anteflexion

Anteversion: it is the angle between the long axis of cervix and long axis of vagina. it is 90°

Anteflexion: it is the angle between long axis of body of uterus and long axis of cerix it is 170°



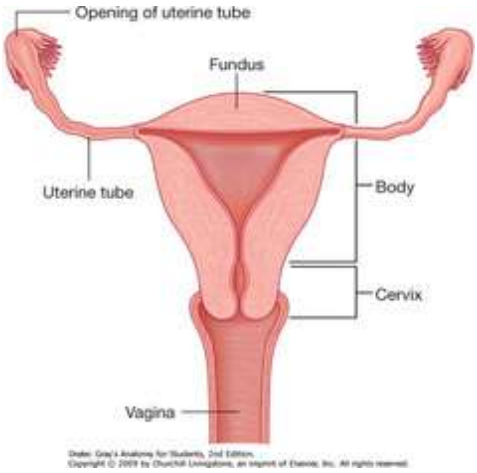
Parts of uterus: from above downwards

Fundus -part which lies above the openings of uterine tube

Body- extends from fundus to isthmus

Cervix -situated below isthmus 2 parts of cervix:

o supravaginal part o vaginal part



NORMAL POSITION OF UTERUS(SA)

It is situated in the true pelvis between urinary bladder and rectum normal position of uterus shows 2 angles – anteversion & anteflexion

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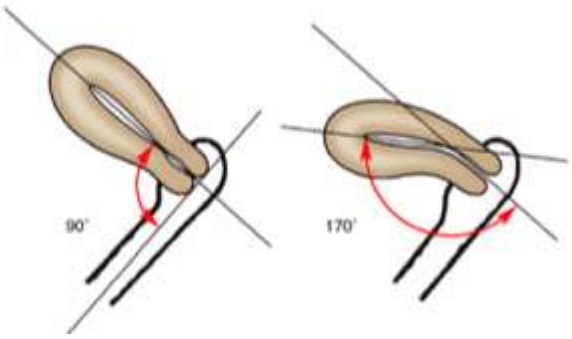
Anteflexion: It is the angle between long axis of body of uterus and long axis of cerix it is 170°

ANTEVERSION AND ANTEFLEXION OF UTERUS (SA)

Anteversion: It is the angle between the long axis of cervix and long axis of vagina. it is 90°

Anteflexion: It is the angle between long axis of body of uterus and long axis of cerix it is 125°



CONTENTS OF BROAD LIGAMENT(SA)

Uterine tube
Round ligament
Ligament of ovary
Uterine vessels & ovarian vessels
Uterovaginal plexus & ovrian plexus of nerves
Epoophoron and its duct
Paroophoron
Vesicular appendices
Lymphatics fibroareolar tissue

SUPPORTS OF UTERUS(SE)

<u>supports of uterus</u>

primary support

muscular

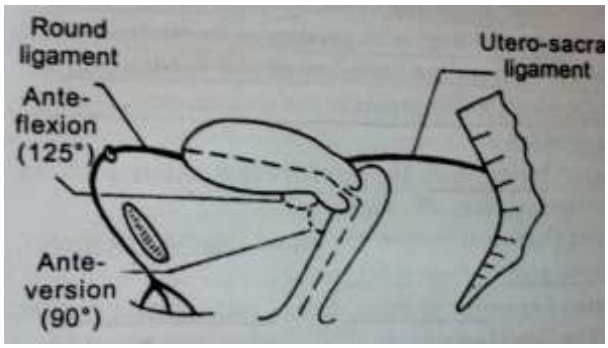
pelvic diaphragm
perineal body
urogenital diaphragm

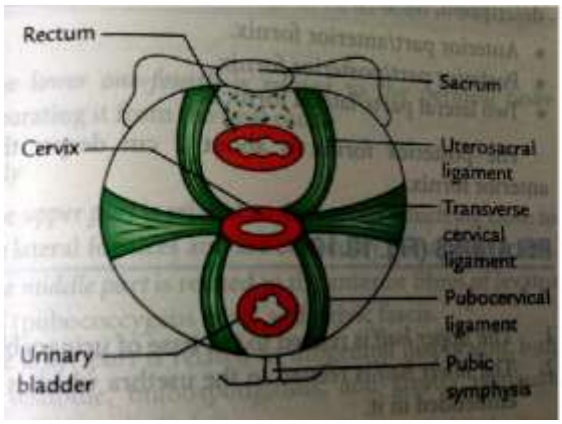
fibromuscular or mechanical

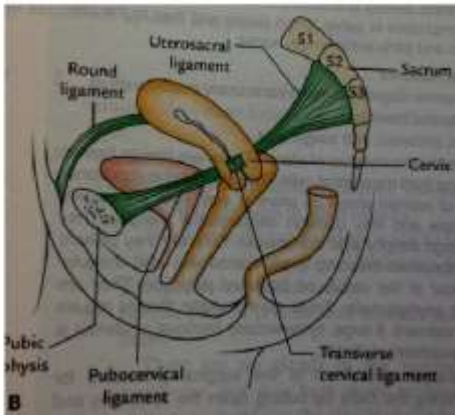
uterine axis – anteversion & anteflexion
transverse cervical ligament pucocervical ligament
uterosacral ligament round ligament of uterus

secondary supports

Broad ligament of uterus
Uterovesical fold of peritoneum
Rectovaginal fold of peritoneum







BROAD LIGAMENT OF UTERUS – ATTACHMENTS AND CONTENTS(SE)

Broad ligaments attachment:

these are a pair of double layered peritoneal folds extending from lateral border of uterus to lateral pelvic wall

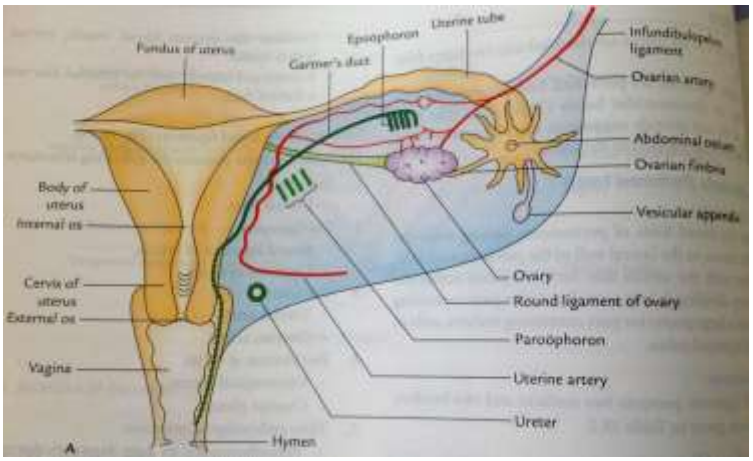
superior border is free where the two layers become continuous with each other

parts :

Mesosalpinx
Mesometrium
Mesovarium
Infundibulopelvic ligament (Suspensory ligament of ovary)

contents of broad ligament :

Uterine tube
Round ligament
Ligament of ovary
Uterine artery &
ovarian artery
Uterovaginal plexus&ovarian plexus of nerves
Epoophoron and its duct
Paroophoron
Vesicular appendices
Lymphatics
Fibroareolar tissue



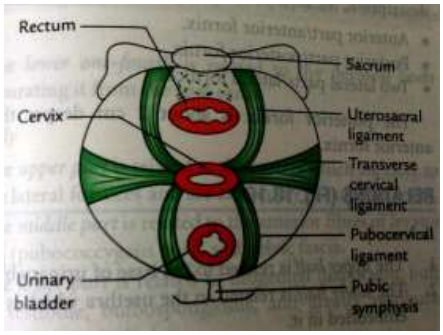
LIGAMENTS OF UTERUS(SE)

i)true ligaments (paired)

Round Ligament
Transverse Cervical Ligament
Uterosacral Ligament
Pubocervical Ligament

ii)false ligaments

Broad Ligament (Paired)
Rectouterine Fold(Paired)
Uterovesical Fold
Rectovaginal Fold

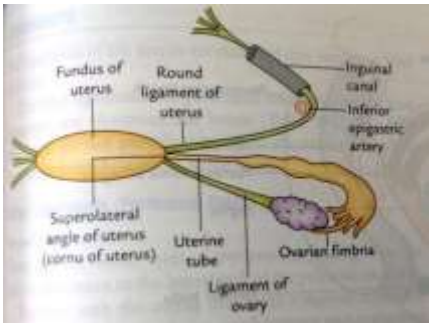


Round ligament of uterus:

It is a fibromuscular band ,10-12cm in length. extends from cornua of uterus, passes downwards and laterally within broad ligament

passes through deep inguinal ring
traverses the inguinal canal

finally splits into many fibrous threads to get attached to
subcutaneous tissue of labium majora
functionally important to maintain anteflection of uterus.



Transverse cervical ligament(cardinal ligament or mackenrodt's ligament)
condensation of parametric tissue.
extends from the cervicovaginal junction to lateral pelvic wall
keeps the cervix in position & prevents downward displacement of uterus

Uterosacral ligament:
condensation of parametric tissue
extends from cervix to 3rd sacral vertebra.
ligament pulls cervix backwards and helps in maintain anteflexion and anteversion.

pubocervical ligament:
condensation of parametric tissue extends from
cervix to pubic bones.
ligament pulls the cervix anteriorly and counteracts the traction of uterosacral ligamen

UTERUS – BLOOD SUPPLY AND LYMPHATIC DRAINAGE(SE)

Blood supply:

Arterial supply:

pair of uterine arteries (major supply)

pair of ovarian arteries (partly)

uterine artery –a branch of anterior division of internal iliac artery

crosses from lateral to medial infront of ureter at level of cervix

runs upward in the broad ligament along the lateral border of uterus

as it is running upwards gives aruate arteries, from these radial arteries arise and enter into myometrium to form stratum vasculare within myometrium

two sets of arteries arise from stratum vasculare

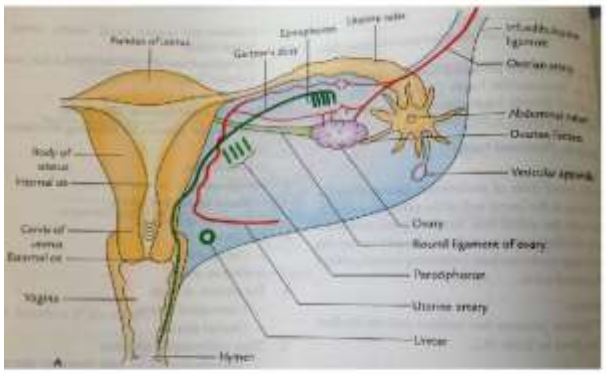
basal and spiral arteries

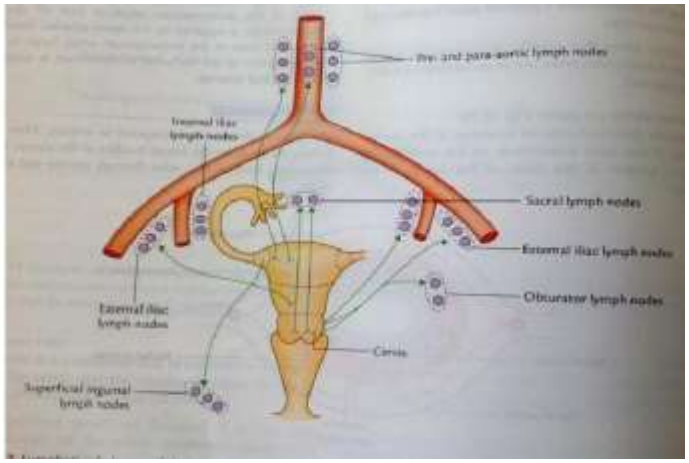
basal artery –supplies stratum basale of endometrium

spiral artery – supplies stratum functionale of endometium

venous drainage:

uterine veins – drain into internal iliac veins





lymphatic drainage:

Fundus & upper part of body – pre and para-aortic lymph nodes

from the cornua – superficial inguinal lymphnodes

Lower part of body – external iliac lymphnodes

Cervix - external iliac lymphnodes, obturator lymphnodes

- internal iliac lymphnodes
- sacral lymphnodes

DESCRIBE UTERUS UNDER FOLLOWING HEADINGS:

A) POSITION (NORMAL AXES) AND PARTS B)PERITONEAL REFLECTIONS C)RELATIONS D) SUPPORTS E)BLOOD SUPPLY F)APPLIED ANATOMY G) DEVELOPMENT(LA)

a)Position & parts:

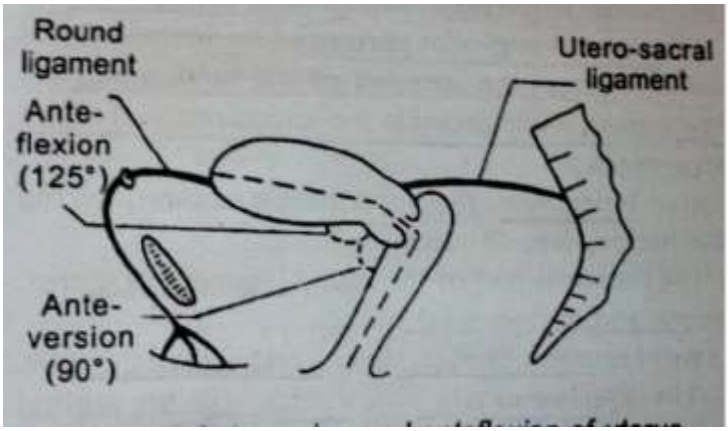
Uterus is situated in the true pelvis between urinary bladder and rectum

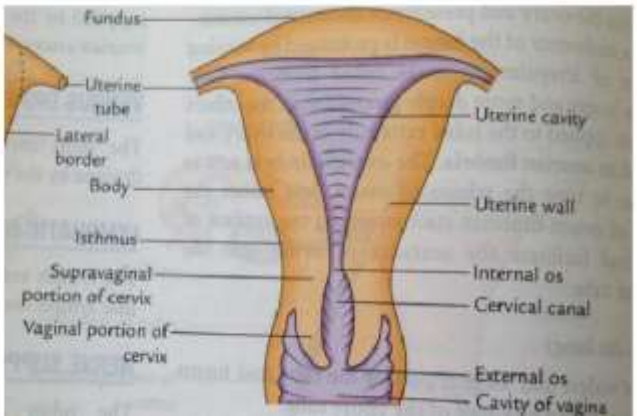
normal position of uterus shows 2 angles – anteversion & anteflexion

anteversion: it is the angle between the long axis of cervix and long axis of vagina.

it is 90°

anteflexion: it is the angle between long axis of body of uterus and long axis of cerix it is 125°





Parts of uterus: from above downwards

Fundus -part which lies above the openings of uterine tube

Body- extends from fundus to isthmus

Cervix –cylindrical part situated below isthmus

2 parts of cervix:

Supravaginal part

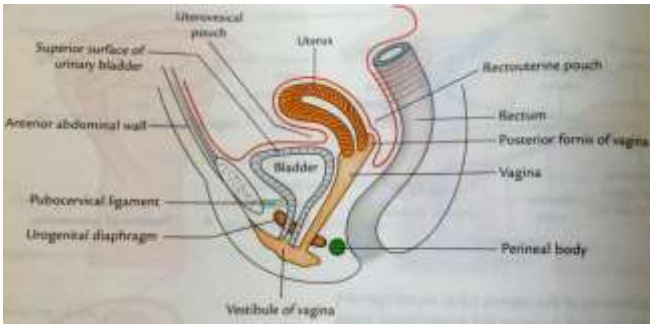
Vaginal part

b) **peritoneal reflection:**

posteriorly- related with rectouterine pouch (of douglas)

anteriorly – related with uterovesical pouch

laterally – gives attachment to broad ligament



peritoneal reflection:

peritoneum from the anterior aspect of middle third of the rectum gets reflected anteriorly as rectovaginal fold of peritoneum

covers the upper third of the posterior wall of vaginal, posterior surface of supravaginal cervix , body of uterus and fundus.

it covers the superior & anterior aspect of fundus , lines the anterior aspect of body of uterus upto the isthmus.

from the isthmus peritoneum gets reflected anteriorly as uterovesical fold and lines the superior surface of urinary bladder.

laterally from the lateral border of the uterus double layer of peritoneal fold gets reflected to the lateral pelvic wall as broad ligament.

c) **relations**:

anteriorly:

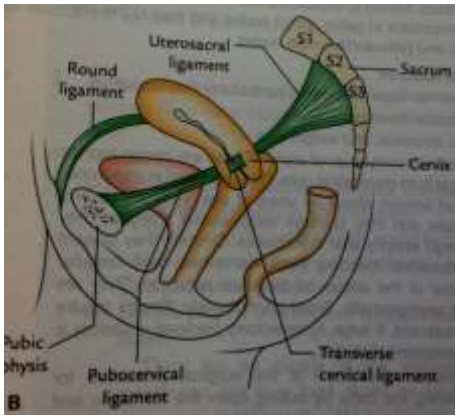
body of uterus – uterovesical pouch and superior surface of bladder
supravaginal part of cervix –posterior surface of urinary bladder
vaginal part of cervix – anterior fornix of the vagina

posteriorly:

body of uterus – recto uterine pouch with coils of ileum and sigmoid colon
supravaginal part of cervix - recto uterine pouch with coils of ileum and sigmoid colon vaginal part of cervix – posterior fornix

laterally –

body of uterus: broad ligament of uterus and uterine vessels
supravaginal part of cervix – ureter and uterine artery
vaginal part of cervix- lateral fornices of vagina



d) supports

primary support

muscular

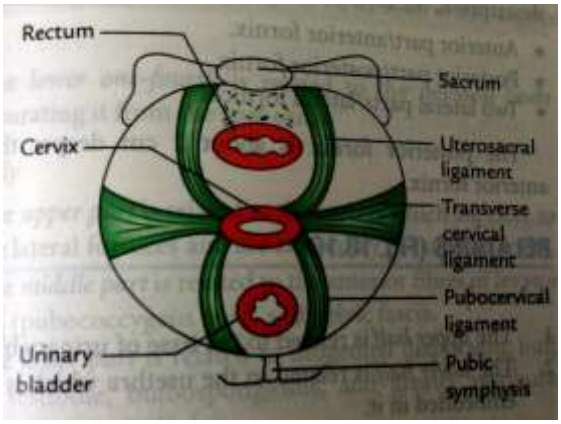
pelvic diaphragm
perineal body
urogenital diaphragm

fibromuscular or mechanical

uterine axis – anteversion & anteflexion
transverse cervical ligament
pucocervical ligament
uterosacral ligament
round ligament of uterus

secondary supports

Broad ligament of uterus
Uterovesical fold of peritoneum
rectovaginal fold of peritoneum



e) blood supply:

Arterial supply:

pair of uterine arteries (major supply) pair of ovarian arteries (partly)

uterine artery – a branch of anterior division of internal iliac artery crosses from lateral to medial infront of ureter at level of cervix runs upward in the broad ligament along the lateral border of uterus at the cornu of uterus turns laterally to anastomoses with ovarian artery

venous drainage:

uterine veins – drain into internal iliac veins (major venous drainage)
ovarian veins(partly)

f) **applied anatomy**:

prolapse of uterus:

if there is any injury to perineal body or pelvic diaphragm during child birth and left unrepaired then it can lead to prolapsed of uterus.

hysterectomy- surgical removal of uterus

g) development

The portion of mullarian ducts which lie in the genital cord fuse to form the uterus and vagina.

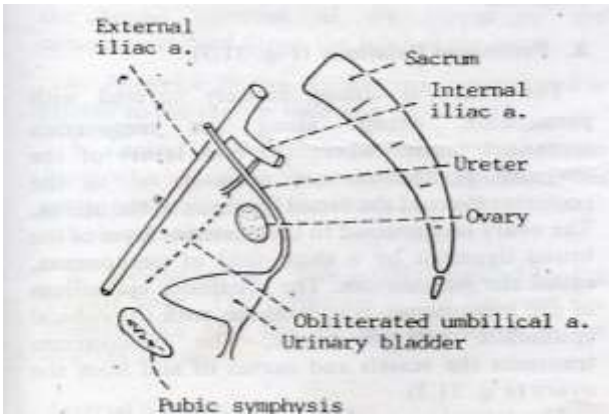
This fusion of the Müllerian ducts begins in the third month, and the septum formed by their fused medial walls disappears from below upward.

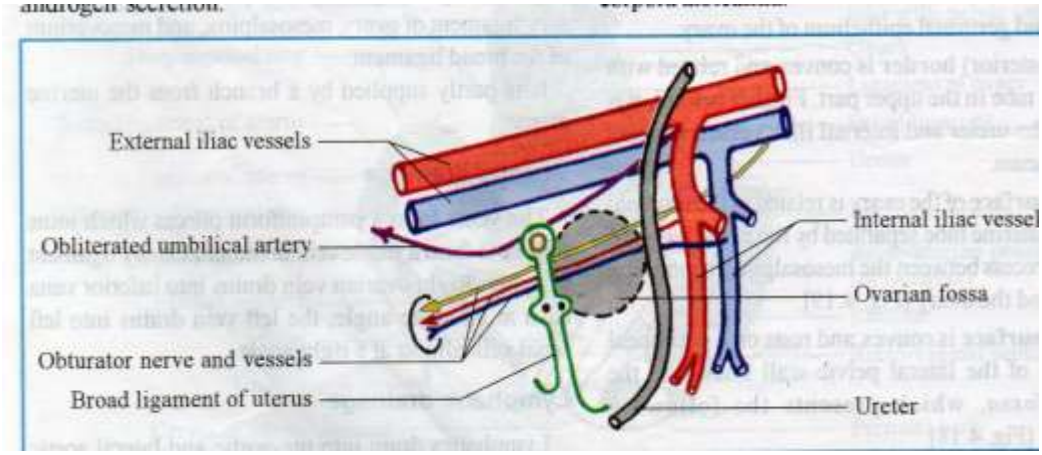
The parts outside this cord remain separate, and each forms the corresponding Fallopian tube.

The ostium of the fallopian tube remains from the anterior extremity of the original tubular invagination from the abdominal cavity.

OVARIAN FOSSA(SA)

It is the peritoneal depression on the lateral pelvic wall
Each ovary lies in the ovarian fossa that is bounded
anteriorly - obliterated umblical artery
posteriorly – ureter and internal iliac vessels
superiorly – external iliac vein
laterally – parietal peritoneum with obturator nerves and vessels beneath it





OVARY – POSITIONS, SURFACES, RELATIONS,LIGAMENTS, BLOOD SUPPLY(SE)

Ovary- positions

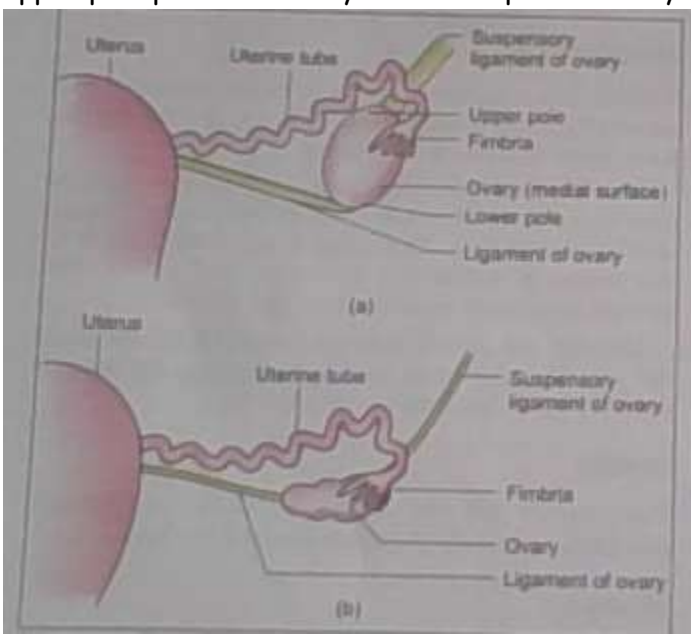
nulliparous adult

-long axis is vertical having upper pole and lower pole

Multiparous women

-long axis horizontal due to pull by pregnant uterus

upper pole points laterally and lower pole medially



<u>surfaces:</u>

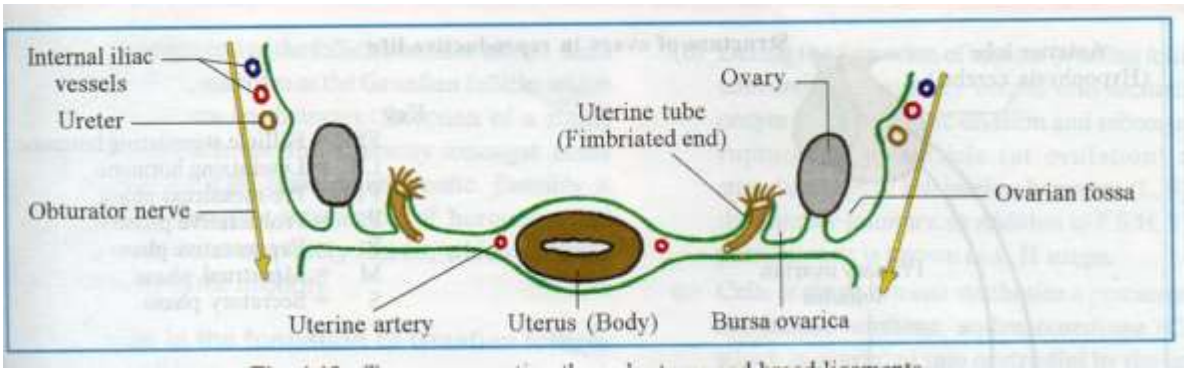
medial surface:

covered by uterine tube. the peritoneal recess between mesosalpinx and this surface is known as ovarian bursa

lateral surface:

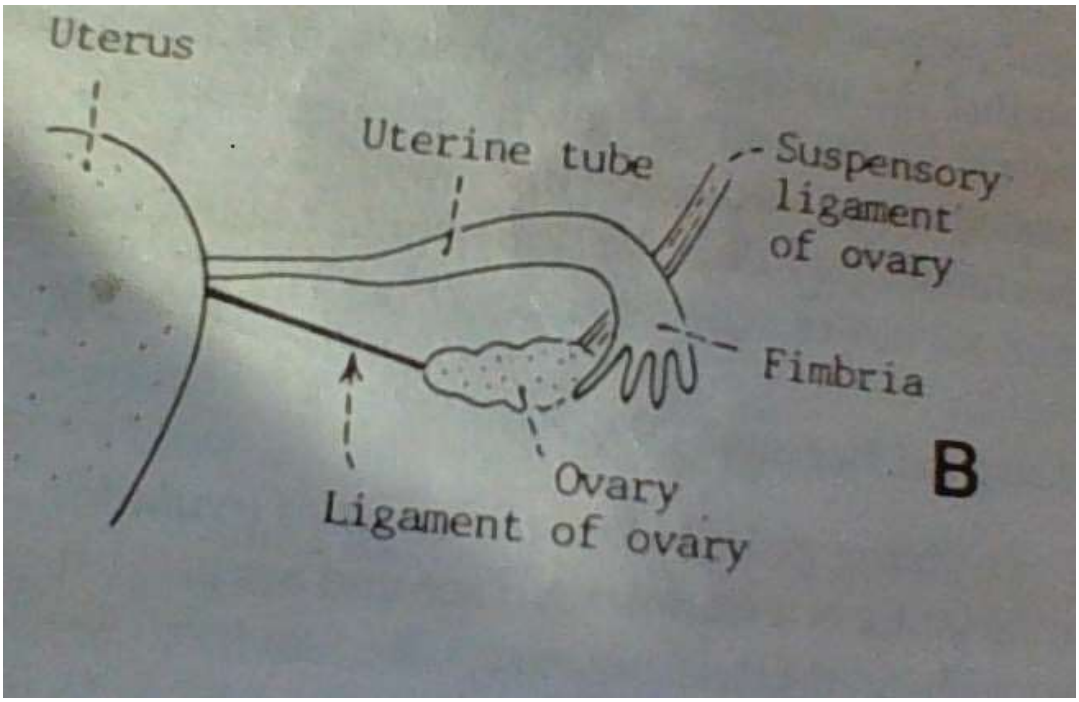
related to ovarian fossa lined by parietal peritoneum

this peritoneum separates the ovary from obturator vessels and nerves



Relations:

tubal end: uterine tube
ovarian fimbria
suspensory ligament of ovary
uterine end: ligament of ovary
anterior border: mesovarium with ovarian vessels and nerves
posterior border: ureter and internal iliac vessels



Ligaments:

suspensory ligament of ovary: connects uterine tube and ovary to pelvic brim.
conveys ovarian vessels

Ligament of ovary:

connects lateral angle of uterus to uterine end of ovary
remnant of gubernaculum ovary

Mesovarium:

it is a fold derived from posterior layer of broad ligament
acts as an hilum of ovary
transmits ovarian vessels and nerves

Blood supply:

Arterial supply:

mainly supplied by ovarian arteries – branch ofabdominal aorta
partly supplied by uterine arteries – branch of anterior division of internal iliac

Venous drainage:

veins form pampiniform plexus around ovary

condenses into single ovarian vein and right side drains into ivc and left side into left renal vein

FALLOPIAN TUBE PARTS(SE)

parts:

uterine ostium -1 mm
lateral angle of uterus

pelvic/abdominal ostium - 3 mm
lateral end of the tube
pierces broad ligament-
communicates with peritoneal cavity-
fimbriated end

Intramural/interstitial – 1cm
uterus at junction of fundus and body

Isthmus-3cm-cordlike

Ampulla – 5cm- thin,dilated and tortuous
fertilisation takes place in ampulla

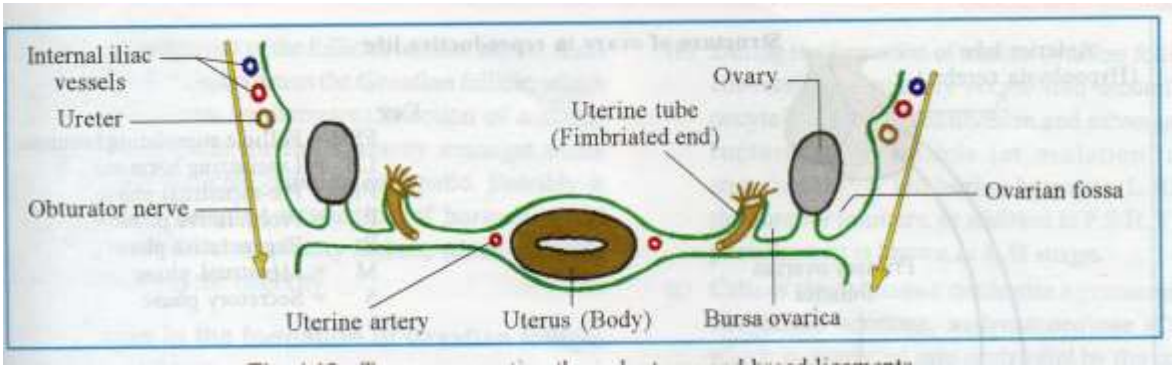
Infundibulum- 1cm.

MESOVARIUM(SA)

It is a fold derived from posterior layer of broad ligament where the ovary is attached by its anterior border.

Acts as an hilum of ovary.

Transmits ovarian vessels and nerves



OVARIAN FOSSA(SA)

It is the peritoneal depression on the lateral pelvic wall

each ovary lies in the ovarian fossa that is bounded

(1) anteriorly - obliterated umblical artery

(2) posteriorly – ureter and internal iliac vessels

(3) superiorly – external iliac vein

(4) laterally – parietal peritoneum with obturator nerves and vessels beneath it

FALLOPIAN TUBE PARTS AND BLOOD SUPPLY(SA)

Parts:

They are described in 4 parts (lateral to medial);

Fimbriae: Finger-like, ciliated projections which capture the ovum from the surface of the ovary.

Infundibulum: Funnel-shaped opening near the ovary to which fimbriae are attached.

1cm

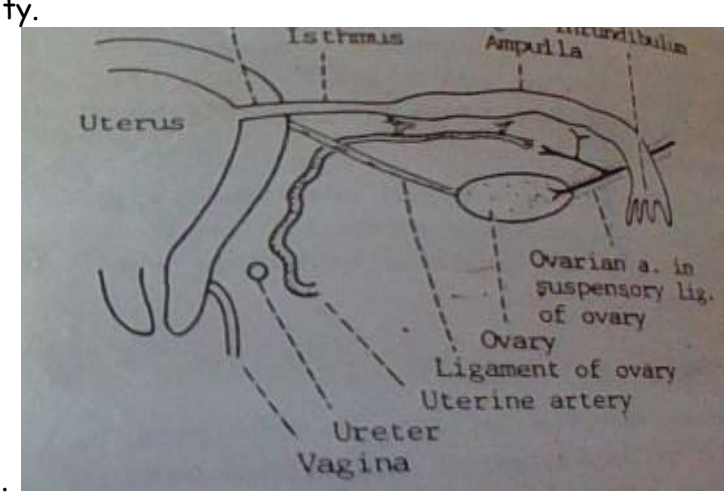
Ampulla: Widest section of the uterine tubes.

5cm

Thin, dilated and tortuous

Fertilization usually occurs here.

Isthmus: Narrow section of the uterine tubes connecting the ampulla to the uterine cavity.



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Blood supply:

Arterial supply:

anastomoses between ovarian artery – branch of abdominal aorta

uterine artery – anterior division of internal iliac artery

Venous drainage:

right side – ovarian vein draining into inferior vena cava.

left side – uterine vein into left renal vein.

TUBAL PREGNANCY / ECTOPIC PREGNANCY (SA)

It is a condition where the fertilized ovum fails to migrate to the uterine cavity and gets adhered on the wall of the uterine tube and starts developing.

The fallopian tubes are not designed to hold a growing embryo; thus, the fertilized egg in a tubal pregnancy cannot develop properly.

This leads to the rupture of uterine tube and produces hemorrhage requiring surgical intervention.

An ectopic pregnancy happens in **1 out of 50 pregnancies**.

TUBECTOMY(SA)

one of the permanent methods of female sterilization

It is the ideal method of family planning done through laparascopic endoscopy.

Involves removing a segment of uterine tubes on both sides and ligating its ends.

Ihis prevents male gamete coming in contact with female gamete and hence no fertilization takes place.

CONTENTS OF BROAD LIGAMENT(SA)

The structures that run within the broad ligament are:

- The uterine tube
- The round ligament of the uterus
- Ligament of the ovary
- Uterine vessels close to their point of attachment
- Ovarian vessels in the infundibulopelvic ligament
- Uterovaginal and ovarian nerve plexuses
- Epoophoron (organ of Rosenmüller)
- Paroophoron (similar to epoophoron, mesonephric tubular remnants)
- Lymph nodes and vessels
- Parametrium (fibrofatty layer)

COURSE & BRANCHES OF UTERINE ARTERY(SA)

The uterine artery arises from the anterior division of the internal iliac artery just below or in common with the vaginal artery.

It passes downward and medially on the levator ani toward the cervix.

It crosses in front of the ureter one to one and a half centimeters from the cervix.

It then turns upward and ascends in a twisted course between the layers of the broad ligament and on the side of the uterus.

It sends numerous branches at a right angle to spread over both surfaces of the uterus in a winding way.

It anastomoses with the uterine branch of the ovarian artery.

The cervical branch of the uterine artery springs from that vessel as it crosses the ureter. It passes directly medially and divides into four or five branches. Some of these branches anastomose with branches of the vaginal to form the vaginal arteries. They run along the median line of the vaginal wall, one lying in front and the other behind.

UTEROSACRAL LIGAMENT(SA)

These are also condensations of the endopelvic fascia.

They connect the cervix to the periosteum of the sacrum(s2, s3) and are enclosed within rectouterine folds of peritoneum.

The uterosacral ligaments keep the cervix braced backwards against the forward pull of the round ligaments.

The two ligaments maintains the uterine axis.

VAGINA(SA)

The vagina is a fibromuscular canal forming the copulatory organ.
It is about 8cm (3in) long,
Extends from vulva to the uterus.
The vagina is very elastic, so it can easily stretch around a man's penis or around a baby during labour.
Vaginas vary in shape, size and colour.
Some are small and ovoid [egg-shaped], some are large and cylindrical, and the colours can vary from light pink to a deep brownish red-pink.