The Placenta

Organ of exchange between maternal and fetal blood

External Features:

- **Shape:** Disk Shape
- **Thickness:** 3cm
- **Diameter:** 15 - 20cm
- **Weight:** 500 - 600g
- **Site:** Upper uterine cavity post. wall

Fetal Surface

Formed from Chroinic plate

Facing the fetus, Smooth, covered with amnion, umbilical cord attached near to its center

Maternal Surface

Formed from Decidua Basalis

Contacts uterine wall internal surface, 15-20 cotyledons seperated by grooves, covered by decidua basalis

Functions Of Placenta

Function 1:
Exchange of gasses and metabolic products

Function 2:
Transmission of maternal antibodies to fetus starting from 14th week

Function 3:
Prevents passage of bacteria & most viruses from mother to fetus

Function 4:
Excretion of fetal waste such as urea and creatinine

Endocrine Function:

Progesterone:
Maintain pregnancy Endometrium.

Estrogen:
Stimulate uterine growth & mammary gland development.

HCG:
Maintain corpus leteum till 4th month. Used to detect pregnancy

Somatomammoprotein:
Fetal priority on maternal blood glucose

Structure

Chorionic Plate

- Amnion
- Somatic Extraemberyonic Mesoderm
- Cytotrophoblast
- Syncytiotrophoblast

Decidial Plate

- Syncytiotrophoblast
- Decidua Basalis
- Cytotrophoblastic Shell

Chorionic Villi

= Tertiary villi of Chorion Frondosum

- Syncytiotrophoblast (Outer Layer)
- Cytotrophoblast
- Somatic Extraemberyonic Mesoderm
- Fetal Blood Vessels Endothelium

- **STEM VILLI** — Between Chorionic & Decidial Plates
- **FLOATING VILLI** — Side Branches floating in intervillous space

Intervillous Spaces

- Intercommunicating spaces separating stem villi.
- Extending from chronic plate to decidual plate.
- Maternal arterioles and venules open into them.

Placental Septa

- Incomplete septa from decicual plate to intervillous cavity
- Decidua basalis core, covered with Cytotrophoblast & Syncytiotrophoblast

Placental Circulation

Maternal

Arterial blood enters intervillous space, deoxygenates, and leaves through veinules. Full term placenta cycles 150ml maternal blood 3-4 times a minute.

Fetal

Umbilical arteries leave fetus through umbilical cord, reaching placenta where they branch & enter villi. After oxygenation, blood taken through LT Umbilical vein into the heart to be circulated.

Placental Barriers

Membranes separating maternal and fetal blood in placenta

Early Barrier:
- Fetal BV Endothelium
- Somatic Extra-emberyonic Mesoderm
- Cytotrophoblast
- Syncytiotrophoblast

At 4th month, becomes **LATE BARRIER**

Late Barrier:
- Fetal BV Endothelium
- Syncytiotrophoblast

Placental membrane thins in 2nd half pregnancy to allow rapid exchange.

Functions of Barriers

- Separation of Maternal and Fetal Blood
- Allows exchange of Nutrients, gasses, and waste
- Prevents passage of bacteria and most viruses
- Prevents passage of most hormones and toxins

Abnormalities

In Position:

Placenta Previa:
Implantation occurs at uterus lower level:
Complete Placenta: Covers internal os fully
Partial Placenta: Covers internal os partially
Marginal placenta: Lower edge placenta lies at margin of internal os

Low Lying Placenta:
Implantation in lower segment uterine cavity, Where lower edge of placenta lies within 2cm away from internal os margin.

In Shape:

Bilobed | Trilobed

In Number:

Twin:
2 Identical Placenta with 2 cords

Accessory:
Main placenta with smaller placenta

In Umbilical cord attachment:

Velamentous:
Umbilical cord attached through membranes

Battle Door:
Umbilical cord attached to placenta margin

In Diameter:

Placenta Membranacea: Thinner or Wider Placenta

In Infiltration:

Accreta
Deep Infiltration of Placenta

Increta
Infiltration to Myometrium

Percreta
Infiltration to Peritoneum