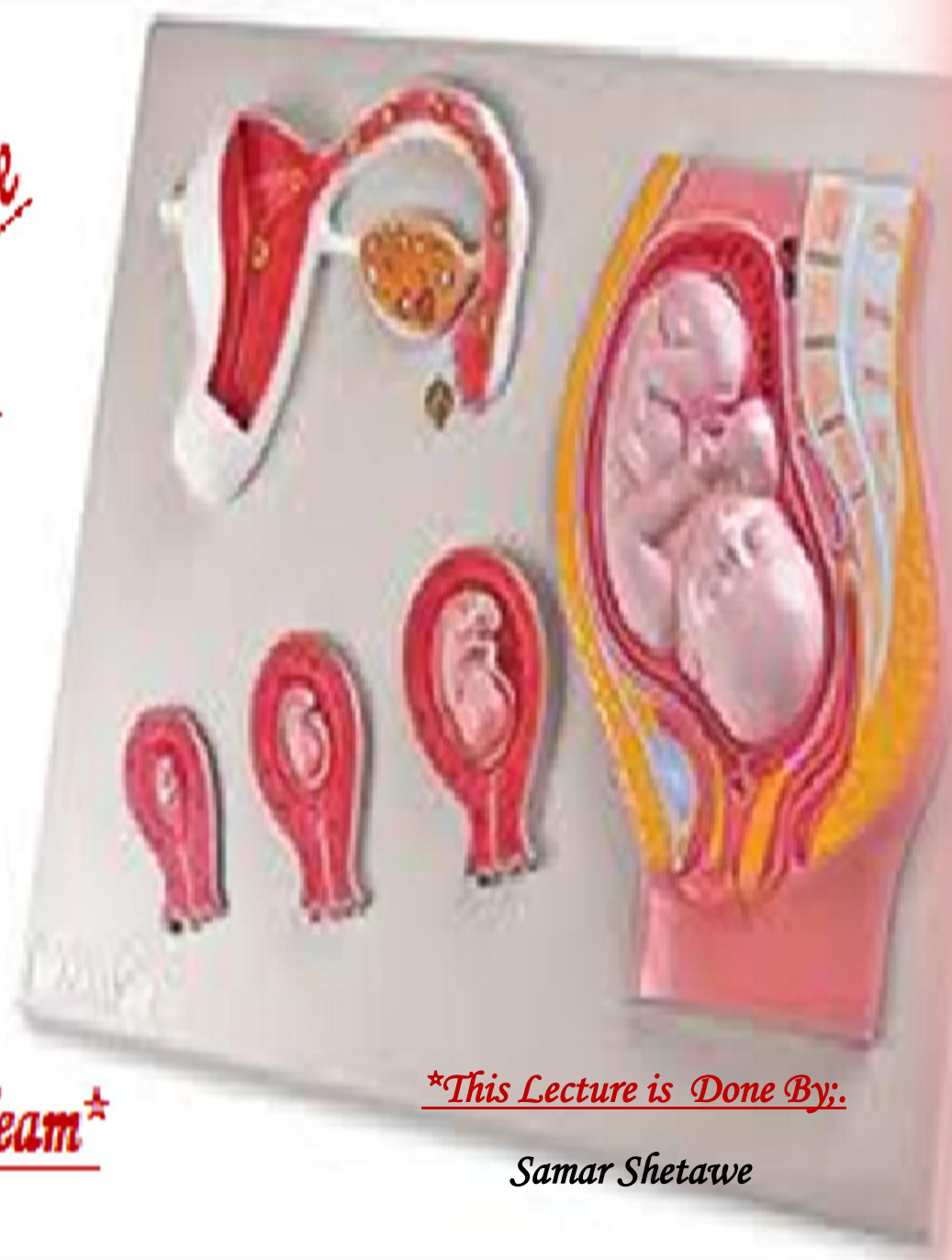




Reproductive System



Anatomy Team

430

This Lecture is Done By:

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The bony pelvis is composed of four bones:

- Two hip bones, which form the anterior and lateral walls.
- Sacrum and coccyx, which form the posterior wall.
- These 4 bones are lined by 4 muscles and connected by 4 joints
- .These 4 joints are :-

- * Symphysis pubis (cartilaginous joint) —————→ **Anteriorly**
- * A pair of sacroiliac joints (Synovial) —————→ **posterolaterally**
- * Sacrococcygeal joint (cartilaginous), between sacrum and coccyx
—————→ **Posteriorly**

-The bony pelvis with its joints and muscles form a strong basin-shaped structure (with multiple foramina), that contains and protects the lower parts of the alimentary, urinary tracts and internal organs of reproduction.

The pelvis is divided into two parts by the pelvic brim.

- 1- Above the brim is the **false or greater pelvis**, which is part of **the abdominal cavity**.
- 2-Below the brim is the **true or lesser pelvis**.

The False or greater pelvis is bounded by:

Anteriorly	Lower part of the anterior abdominal wall. It supports the abdominal contents.
Laterally	Iliac fossae and the iliacus.
Posteriorly	Lumbar vertebrae._

The True pelvis has:

1- Inlet.

2-Outlet.

3- Cavity: Which is a short, curved canal, with a shallow anterior wall and a deeper posterior wall . It lies between the inlet and the outlet.

	Pelvic inlet	Pelvic outlet
Anteriorly	Symphysis pubis.	
Laterally	Ileopectineal (arcuate) lines	
Posteriorly	Sacral promontory, ala of sacrum.	Coccyx
Anterolaterally		ischiopubic ramus (pubic arch)
Posterolaterally		Sacrotuberous ligament

Female and male pelvis :-

1-In female the Sacrum is usually wider in proportion to its length.

2-In female the Angle of the pubic arch is wider.

Types of Female Bony Pelvis:-

1- **Platypelloid (female type)**

2- **Android (male type)**

3- **Gynecoid,**

4- **Anthropoid**

Pelvic walls: -

-It has 4 walls and floor (The walls are formed by bones and ligaments that are lined with muscles covered with fascia and parietal peritoneum).

	Important notes	Muscles
Anterior pelvic wall	It is the shallowest wall and is formed by the posterior surfaces of the symphysis pubis, bodies of the pubic bones, and the pubic rami.	
2 Lateral pelvic walls	It is formed by: -Part of the hip bone below the pelvic inlet, -Obturator internus and its covering fascia & the obturator fascia, -Sacrotuberous ligament -Sacrospinous ligament.	Obturator internus
Posterior pelvic wall	It is wide and formed by sacrum, coccyx , and piriformis muscles and their covering of pelvic fascia.	piriformis muscles
Inferior wall or pelvic floor	-The pelvic floor supports the pelvic viscera and is formed by the pelvic diaphragm (It is formed by the levator ani and the coccygeus muscles and their covering fasciae & It is incomplete anteriorly to allow passage of the urethra in males and the urethra & vagina in females). -It stretches across the true pelvis and divides it into: Main or true pelvic cavity above, which contains the pelvic viscera, and Perineum below which contains the external genital organs.	levator ani and the coccygeus muscle

Muscles :-

	Origin	Insertion	Action	Nerve supply
Piriformis	Front of the middle 3 sacral vertebrae. It leaves the pelvis through the greater sciatic foramen.	Greater trochanter of the femur	Lateral rotator of the femur at the hip joint.	Sacral plexus
Obturator Internus	Inner surface of the obturator membrane and the hip bone. It leaves the pelvis through the lesser sciatic foramen			Nerve to obturator internus

Levator ani muscles :-

-It is a wide thin sheet that has a linear origin from: Back of body of pubis, tendinous arch of the obturator fascia, and the Spine of the ischium.

-Its fibers are divided into 3 parts:

1- Pubococcygeus.

2- Puborectalis

3- Iliococcygeus

Pubococcygeus(anterior fibers)	Puborectalis (intermediate fibers)	Iliococcygeus(posterior fibers)
<p>1-It passes downwards and posteriorly to be inserted into a small fibrous mass, called the anococcygeal body (between the tip of the coccyx and the anal canal) .</p> <p>2-These anterior fibers sweep downward and medially to their Insertion, as follows:</p> <p>1-The levator prostate :-</p> <ul style="list-style-type: none">-form a sling around the prostate-supports the prostate-stabilizes the perineal body. <p>2- sphincter vaginae:-</p> <ul style="list-style-type: none">- form a sling around the vagina.-constricts the vagina-stabilizes the perineal body.	<p>1-It forms a sling around the anorectal junction.</p> <p>2-It has a very important role in maintaining fecal continence.</p>	<p>It`s is inserted into the anococcygeal body and the coccyx.</p>

Actions of levator ani:

- 1-The muscles of the two sides form an efficient muscular sling that supports and maintains the pelvic viscera in position.
- 2-They resist the rise in intra pelvic pressure during the straining and expulsive efforts of the abdominal muscles (as in coughing).
- 3-They also have an important sphincter action on the anorectal junction.
- 4-They serve as a vaginal sphincter in the female

Nerve supply to levator ani:

- 1-perineal branch of the fourth sacral nerve
- 2-perineal branch of the pudendal nerve.

Coccygeus Muscle :-

Origin	Insertion	Action	Nerve supply
Ischial spine	Lower end of sacrum and coccyx	It assists the levator ani in supporting the pelvic viscera	4 th & 5 th sacral nerves

Arteries of the Pelvis:-

- Internal iliac artery:

1-It is a terminal branch of the Common iliac artery.

2-Arises in front of the sacroiliac joint .

3-It descends inferiorly over the pelvic inlet.

4-It divides at the upper border of the greater sciatic foramen into Anterior & Posterior divisions. The anterior division supplies the pelvic viscera (except ovaries) , perineum, gluteal region, adductor (medial) region of the thigh & the fetus (through the umbilical arteries).While the posterior division supplies the posterior abdominal wall, posterior pelvic wall & gluteal region .

Parietal Branches:-

From posterior division	<ul style="list-style-type: none">-Iliolumbar artery (supplies the posterior abdominal wall).-Two Lateral sacral arteries(supplies the posterior pelvic wall).-Superior Gluteal artery(supplies the gluteal region).
From anterior division	<ul style="list-style-type: none">-Inferior Gluteal Artery (supplies the gluteal region).-Obturator artery (supplies the medial region of the thigh)

Visceral Branches (from anterior division of internal iliac artery):-

Umbilical artery	Inferior Vesical artery (in males only):	Middle rectal artery	Internal pudendal artery	Uterine artery	Vaginal artery
<p>-Gives the superior vesical artery that supplies the upper part of the urinary bladder</p> <p>-The distal part of this artery fibrosed and becomes the Medial Umbilical Ligament.</p>	<p>-supplies the lower part of the urinary bladder</p> <p>-In the male it supplies, the Prostate and the Seminal Vesicles.</p> <p>-It gives the artery to the Vas Deferens.</p>	Supplies the rectum	It is the main arterial supply to the perineum	Crosses the Ureter superiorly and supplies the uterus & uterine tubes	Replaces the inferior vesical artery of male.it supplies the vagina .

Visceral Branches (Arises from the abdominal aorta):-

Ovarian artery	Arises from the abdominal aorta. It supplies the ovaries and the uterine tubes .
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Venous& Lymph drainage:-

Venous drainage	Lymph Drainage
Internal iliac vein (It Joins the external iliac vein to form the Common Iliac vein)	Lymph from the pelvis passes through Internal iliac>> External iliac >>common iliac nodes >>lymph from Common iliac nodes & the (Ovaries, uterine tubes & fundus of uterus) passes to>> Lateral aortic (paraortic) nodes.
Ovarian vein:- -Right vein drains into IVC. -Left vein drains into L renal Vein. "Like the venous drainage of the right adrenal gland"	

Nerve Supply:-

Somatic	Autonomic
**Sacral plexus:- -Lies in front of piriformis. -Formed by the Ventral (anterior) rami of a part of L4 & whole L5 (lumbosacral trunk) + S1,2,3 and most of S4.	-Parasympathetic:- 1. Pelvic splanchnic nerves (From S 2 , 3 & 4) >>They are Preganglionic parasympathetic nerves to pelvic viscera & hindgut.
It gives Pudendal nerve to perineum	-Sympathetic :- **Pelvic part of sympathetic trunk: -It is the continuation of the lumbar sympathetic trunk. -It descends in front of the ala of the sacrum and behind the rectum. -Inferiorly they terminate in front of the coccyx as they unit to form a single ganglion called (Ganglion Impar). ** Superior & Inferior Hypogastric plexuses.

SUMMARY :

**** The pelvis is composed of 4 bones are lined by 4 muscles and connected by 4 joints :-**

- the bones are : anterioplatrally : 2hipe bones , posteriorly : sacrum and coccyx.
- the 4 joints are : **Anteriorly** ; Symphysis pubis (2nd cartilaginous joint)
Posteriorlateraly: Two Sacroiliac joints. (Synovial joins), **Posteriorly**: Sacrococcygeal joint (cartilaginous), between sacrum and coccyx.
- **The pelvis is divided into two parts** by the pelvic brim: Above the brim is the False or greater pelvis, which is part of the abdominal cavity and below the brim is the True or lesser pelvis.

-The True pelvis has:

1- Inlet.

2-Outlet.

3- Cavity: Which is a short, curved canal, with a shallow anterior wall and a deeper posterior wall . It lies between the inlet and the outlet.

	Pelvic inlet	Pelvic outlet
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Anterolaterally		ischiopubic ramus (pubic arch)
Posterolaterally		Sacrotuberous ligament

-Female and male pelvis : In female the Sacrum is **usually wider** in proportion to its length Also, the Angle of the pubic arch is **wider**.

-The pelvis has 4 walls :

1- Anterior pelvic wall : formed by the posterior surfaces of the bodies of the pubic bones, the pubic rami, and the symphysis pubis

2- Posterior pelvic wall : It is large and formed by sacrum, coccyx , piriformis muscles and their covering of pelvic fascia.

3- Lateral pelvic wall : it is formed by : Part of the hip bone below the pelvic inlet, Obturator internus and its covering fascia & the obturator fascia, Sacrotuberous & Sacrospinous ligaments

4- Inferior pelvic wall or the pelvic floor : •

- The pelvic floor supports the pelvic viscera and is formed by the pelvic diaphragm . The pelvic diaphragm formed by the levator ani and the **coccygeus muscles** and their covering fasciae . •

-Levator Ani Muscle :

- **Origin :** It is a wide thin sheet that has a linear origin from: Back of body of pubis, tendinous arch of the obturator fascia, and the Spine of the ischium .

-Its fibers are divided into 3 parts:

1- Pubococcygeus.

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-Actions of levator ani:

support the visceral organs , They resist the rise in intra pelvic pressure, have an important sphincter action on the anorectal junction., they serve as a vaginal sphincter in the female.

-Arteries of the Pelvis:

1- Internal iliac artery 2- ovarian artery

-Venous & lymph drainage:

1- Internal iliac vein 2- Ovarian vein drain into : -Right vein drains into IVC , Left vein drains into L renal Vein.

- Lymph from the pelvis passes through Internal iliac>> External iliac >>common iliac nodes >>lymph from Common iliac nodes & the (Ovaries, uterine tubes & fundus of uterus) passes to>> **Lateral aortic (paraortic) nodes**

-NERVE SUPPLY :

-**Somatic** : sacral plexus

- **Autonomic** :

1-Parasympathetic : Pelvic splanchnic nerves

2-Sympathetic : Pelvic part of sympathetic trunk , ****Superior & Inferior Hypogastric plexuses**