

Inguinal Region

Dr Muhammad Aaqib Riaz

Department of Anatomy

Sargodha Medical College

Inguinal Region

- The **inguinal region** (groin) lie between the anterior superior iliac spine and pubic tubercle.
- It has importance anatomically as well as clinically.
- Anatomically because structures exit and enter the abdominal cavity.
- Clinically because it is potential site for herniation.

Anatomy of Inguinal canal

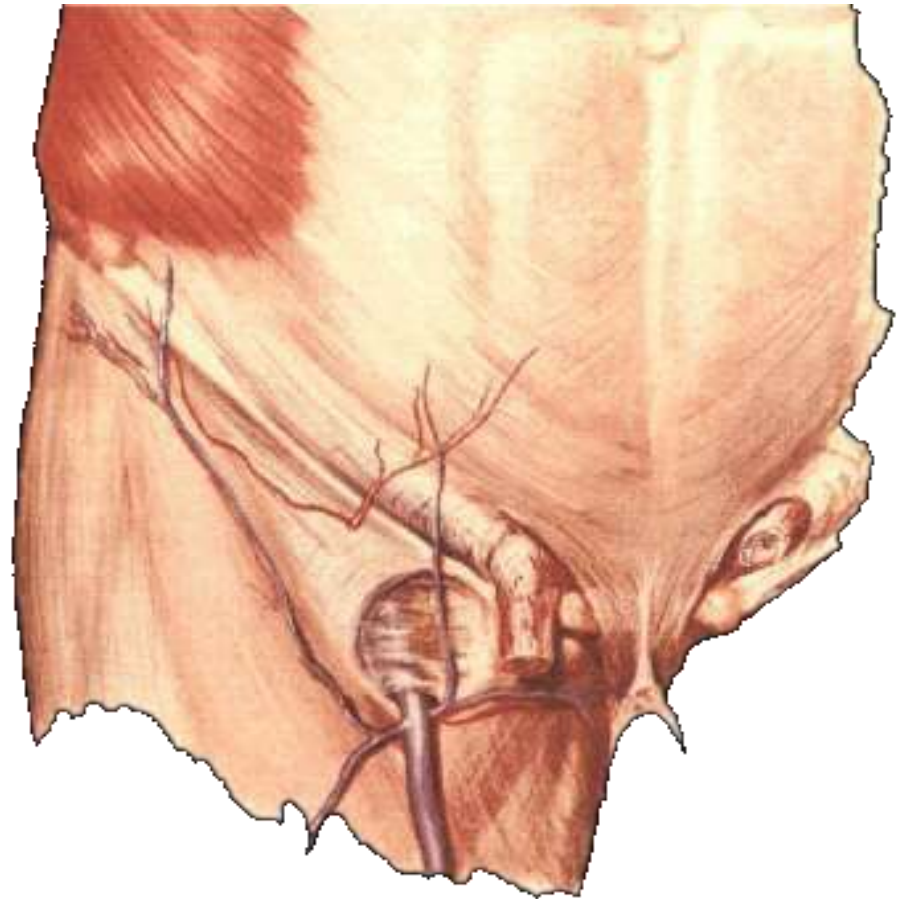
Inguinal Canal

- This is an oblique intermuscular passage in the lower part of the anterior abdominal wall , situated just above the medial half of the inguinal ligament

Inguinal Canal

Location:

- Inferior part of the anterolateral abdominal wall.
- It is about 4cm(1.5 inches) long, and is directed downwards, forwards and medially



Inguinal Canal

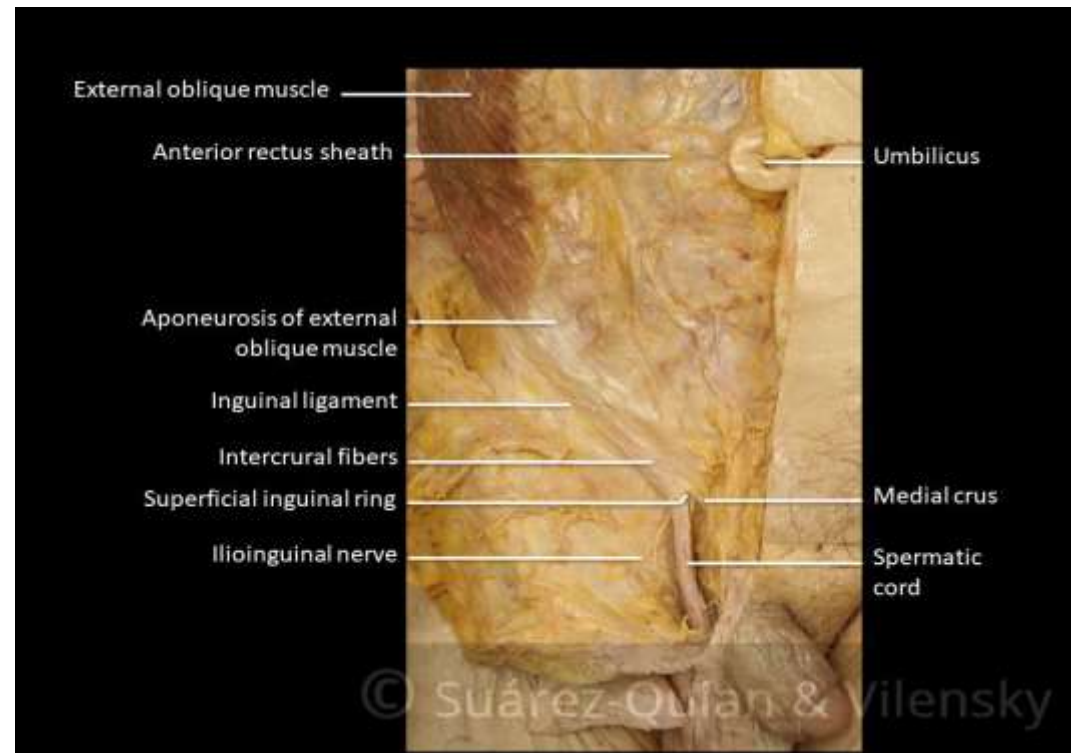
- The inguinal canal extends from the **deep inguinal ring** to the **superficial inguinal ring**.

Deep Inguinal Ring:

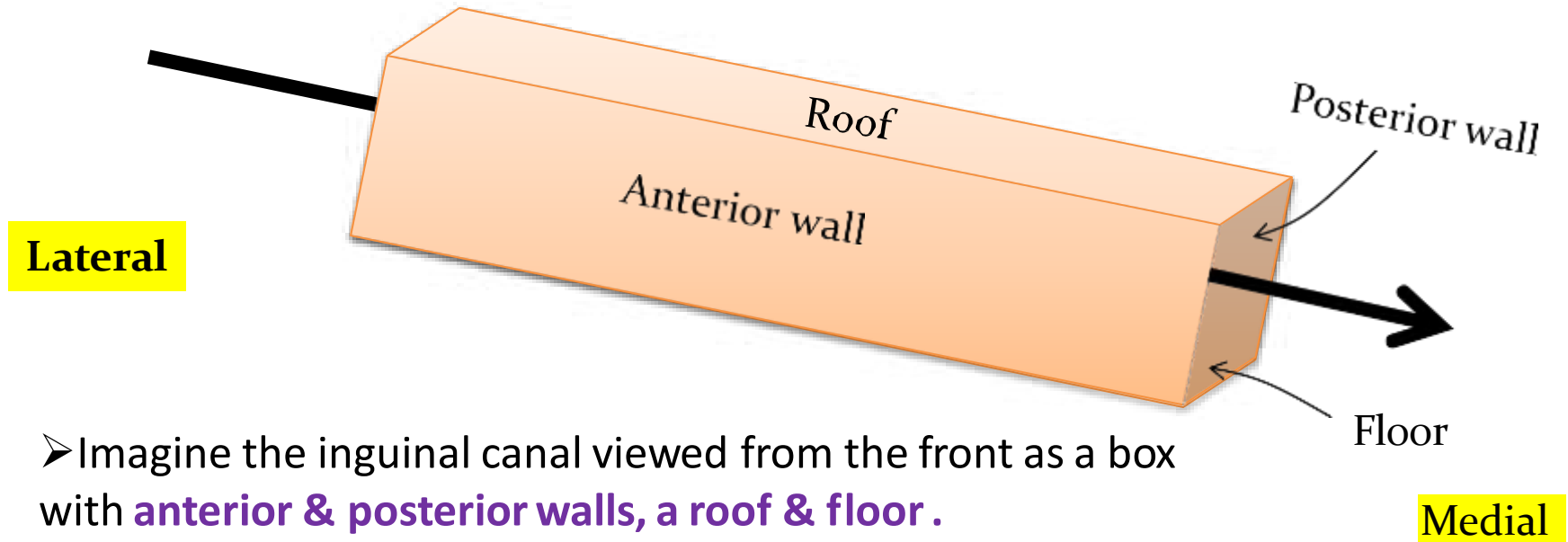
- An oval opening in the fascia transversalis situated 1.2 cm above the midinguinal point, and immediately lateral to the inferior epigastric artery

Superficial Inguinal Ring

- The superficial inguinal ring is a triangular shaped defect in aponeurosis of external oblique muscle.
- Lies immediately above and medially to the pubic tubercle.

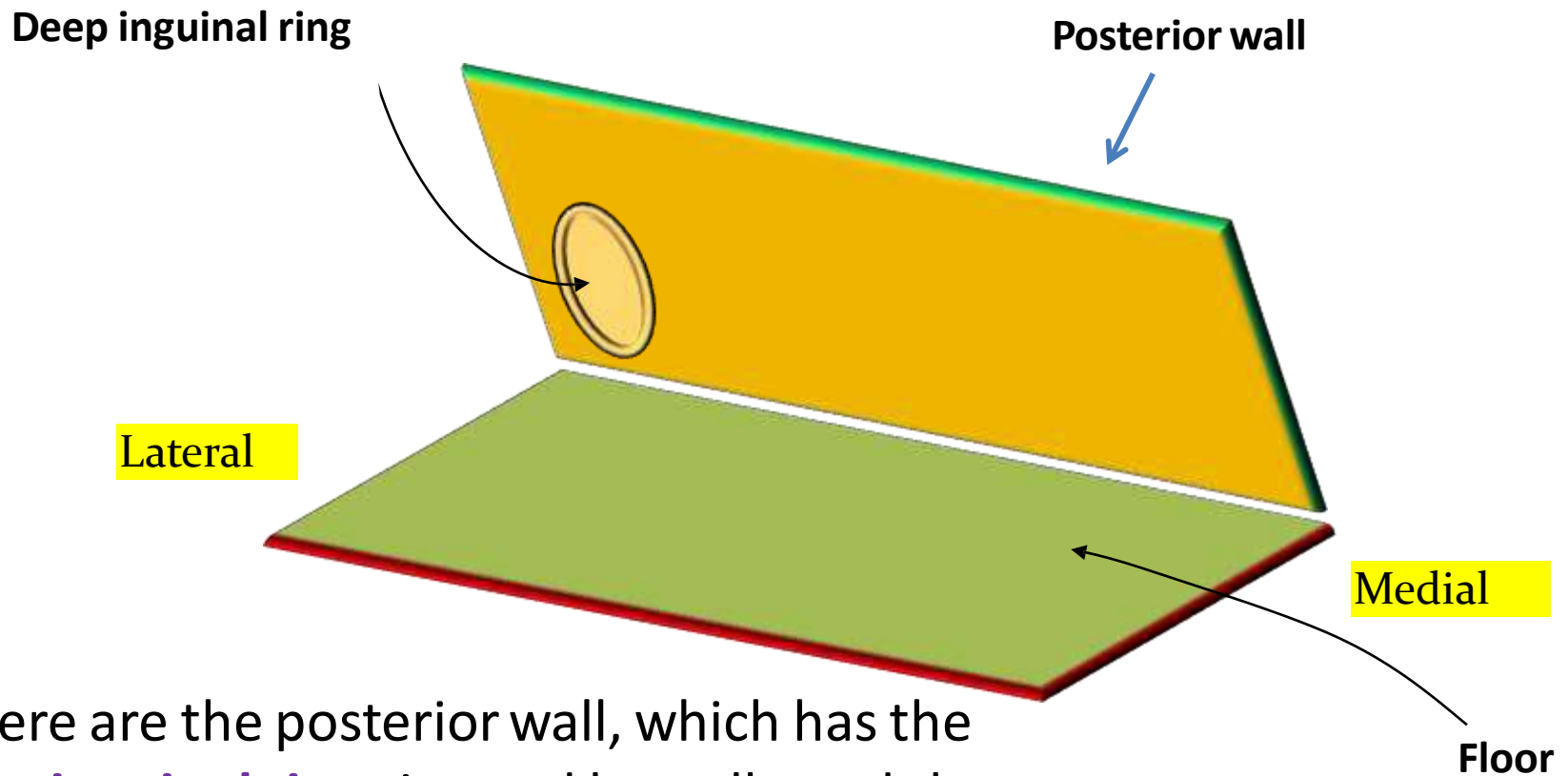


Inguinal Canal



- Imagine the inguinal canal viewed from the front as a box with **anterior & posterior walls, a roof & floor**.
- The arrow indicates that structures can run through it from lateral to medial
 - e.g. in males it transmits the spermatic cord, and in females, the round ligament of the uterus.

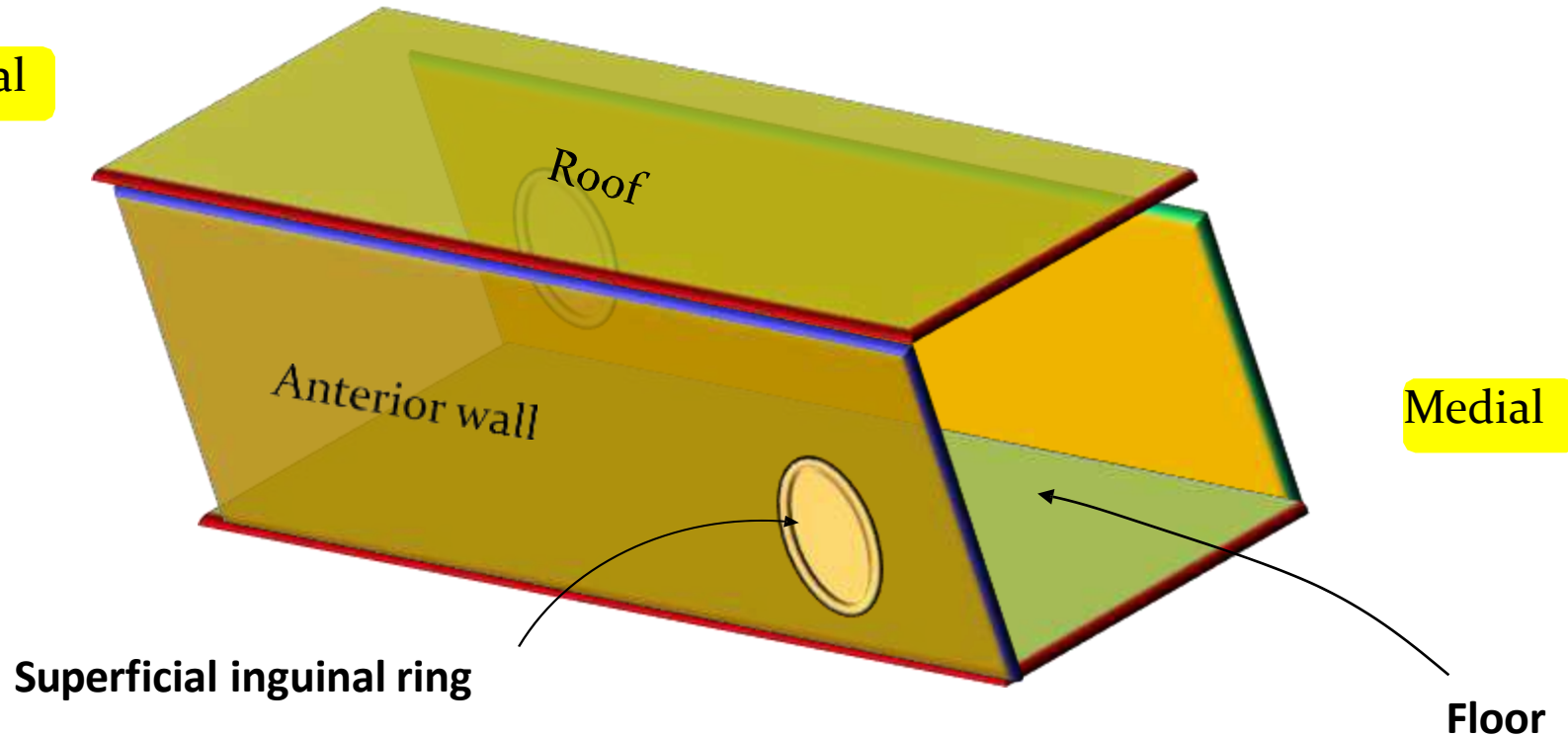
Inguinal canal



❖ Here are the posterior wall, which has the **Deep inguinal ring** situated laterally, and the floor.

Inguinal canal

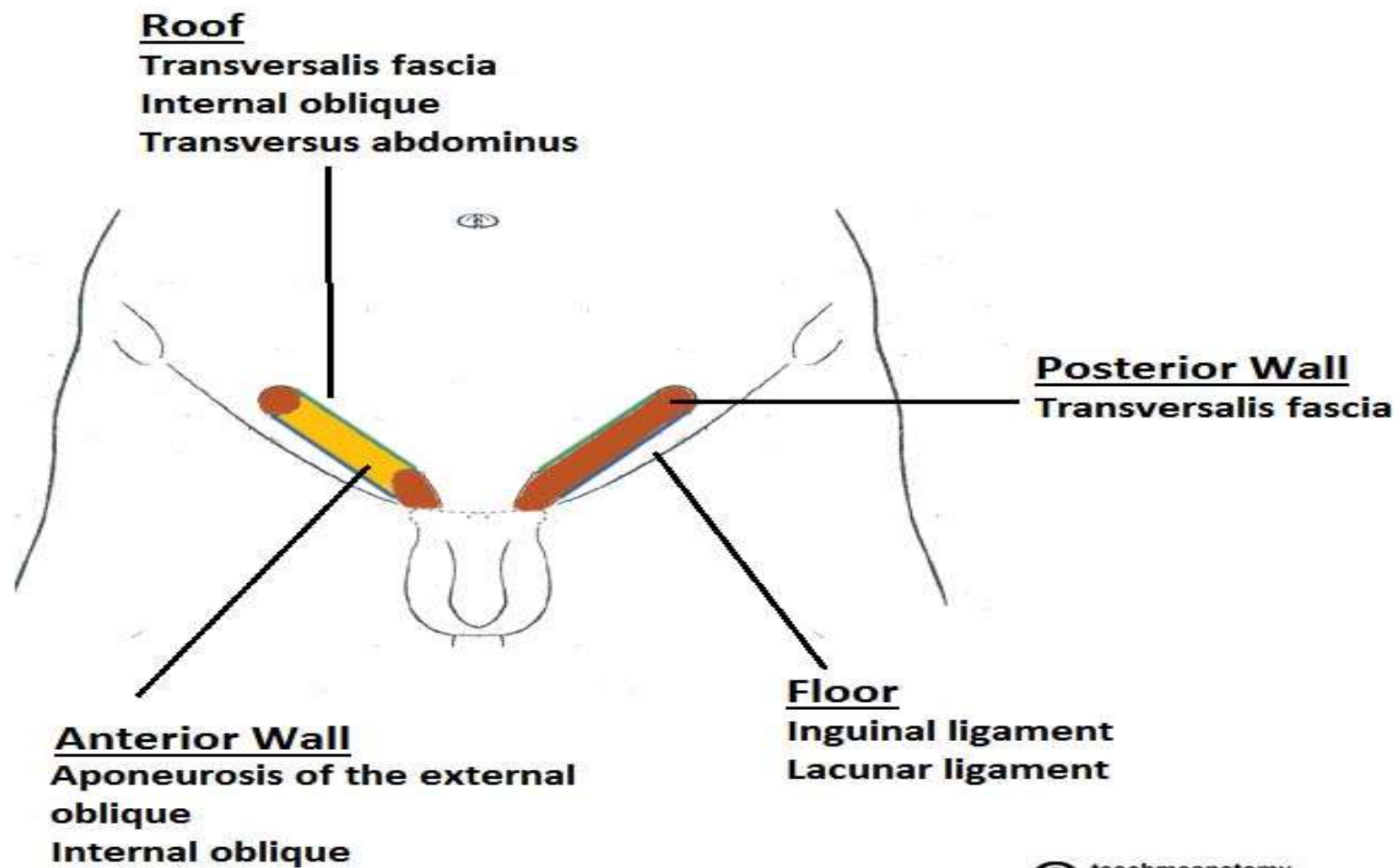
Lateral



Here are the anterior wall (which has the **Superficial inguinal ring** situated medially), and the roof.

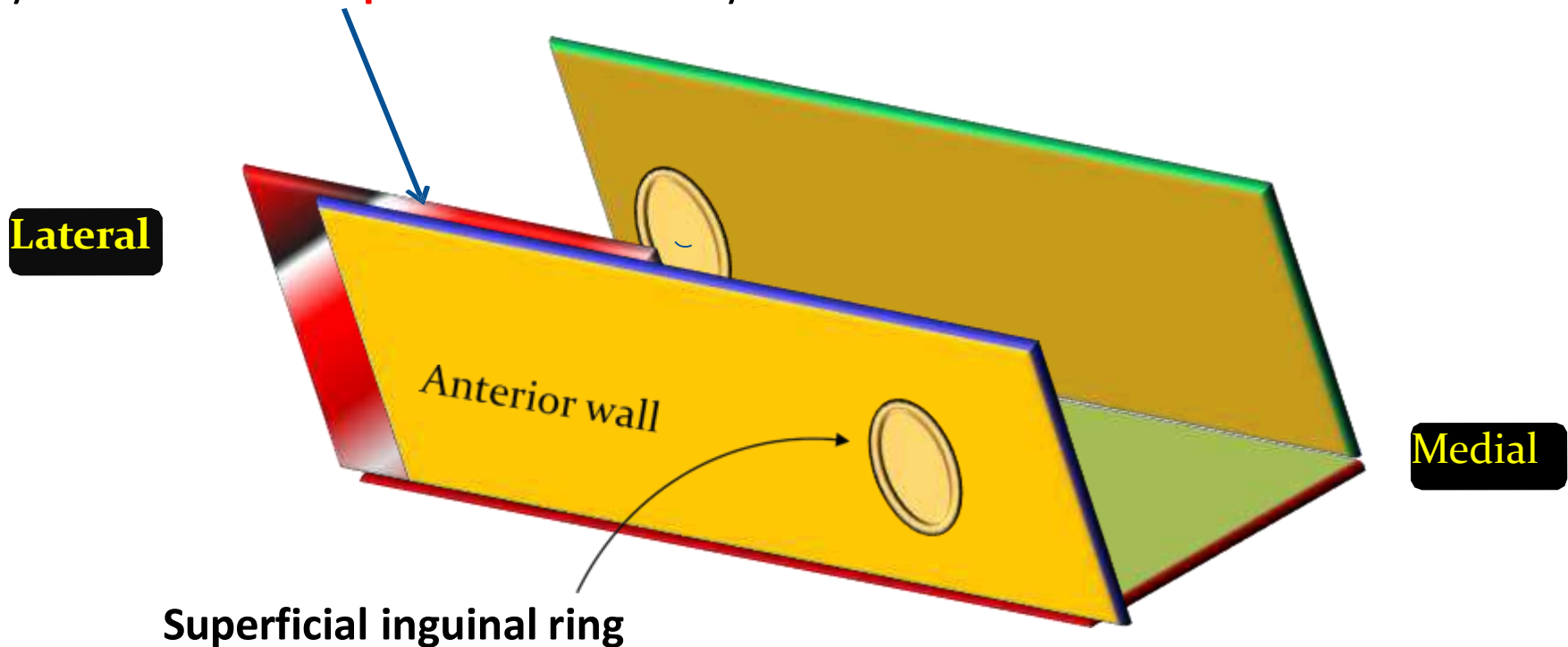
Boundaries of Inguinal Canal

- ❑ **Anterior wall:** Formed by the external oblique aponeurosis and laterally reinforced by internal oblique muscle.
- ❑ **Posterior Wall:** Formed by conjoint tendon medially and transversalis fascia laterally.
- ❑ **Superior wall:** Formed by the arching lowest fibers of the internal oblique and transversus abdominis muscle.
- ❑ **Inferior wall:** Formed by lower edge of the inguinal ligament and medially by lacunar ligament.

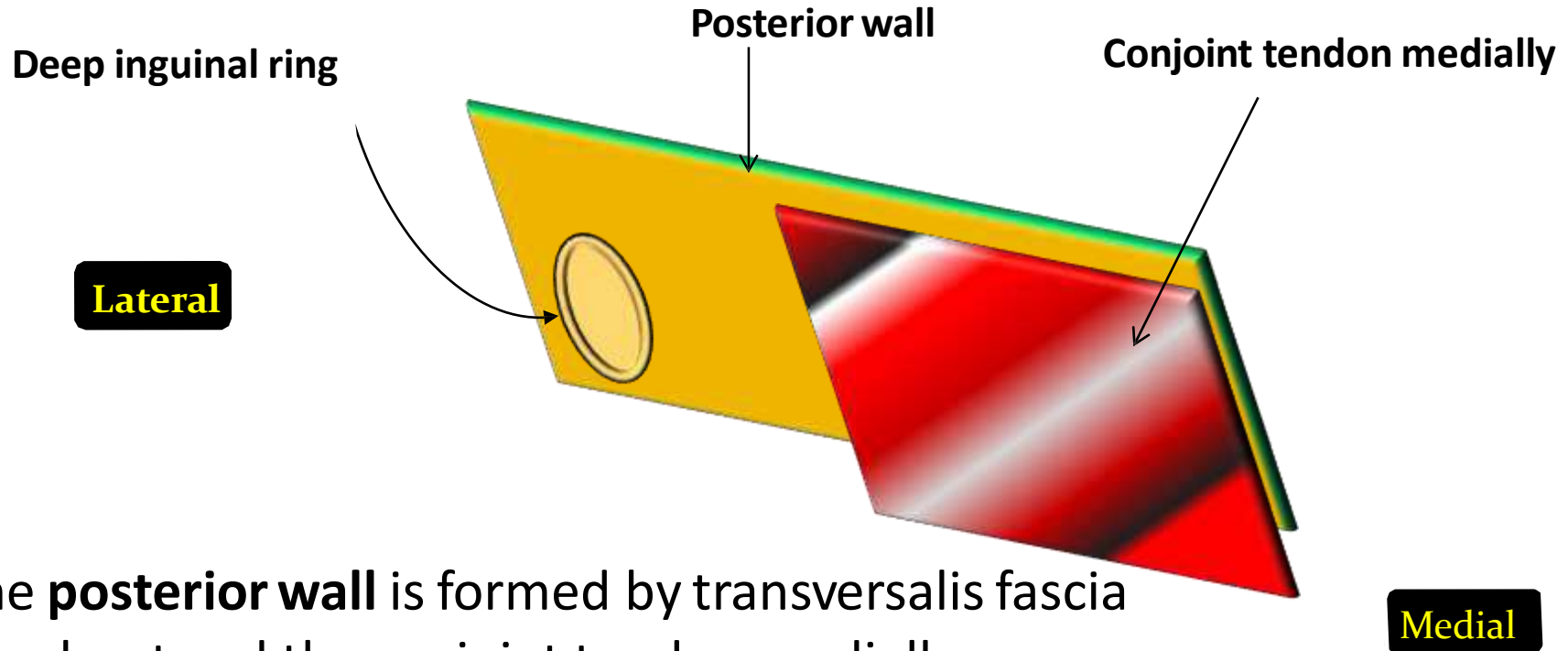


Anterior wall of Inguinal canal

The **anterior wall** is made up of the **external oblique** muscle throughout, and is reinforced by the **internal oblique muscle** laterally.

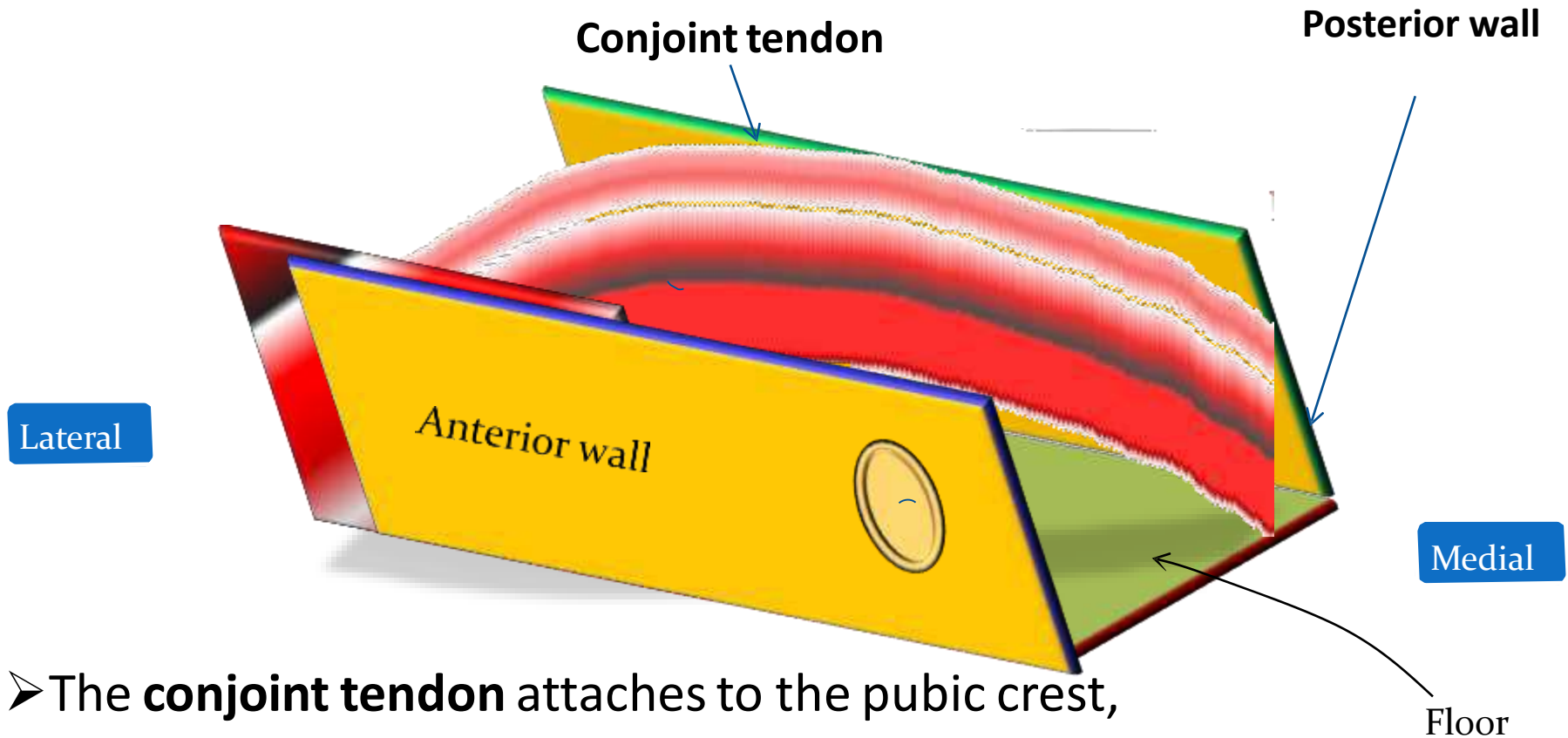


Posterior wall of the inguinal canal



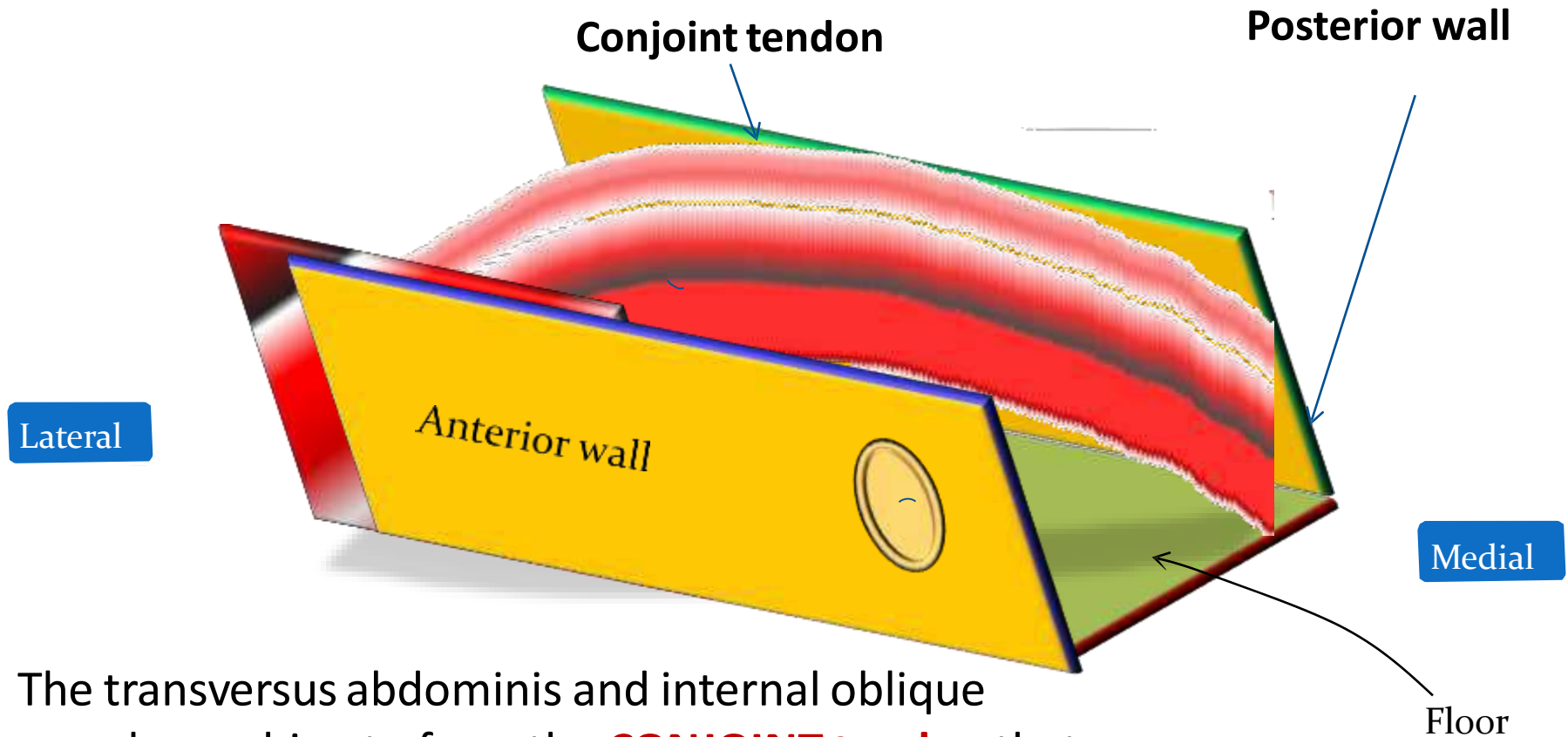
- The **posterior wall** is formed by transversalis fascia throughout and the conjoint tendon medially.
- The wall is particularly weak over the deep inguinal ring

Roof of Inguinal canal



- The **conjoint tendon** attaches to the pubic crest, reinforces the posterior wall medially and also forms the ROOF of the canal

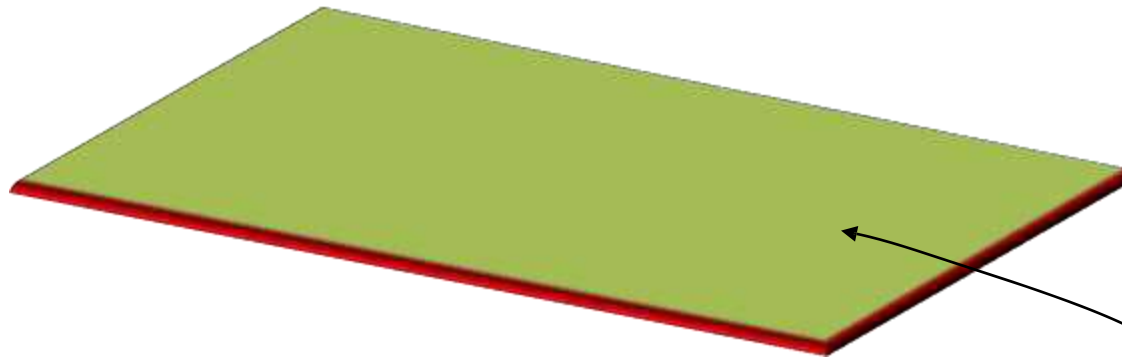
Roof of Inguinal canal



The transversus abdominis and internal oblique muscle combine to form the **CONJOINT tendon** that arches over the contents of the inguinal canal

Floor of the inguinal canal

Lateral



Medial

Floor

Formed by lower edge of the inguinal ligament and medially by lacunar ligament.

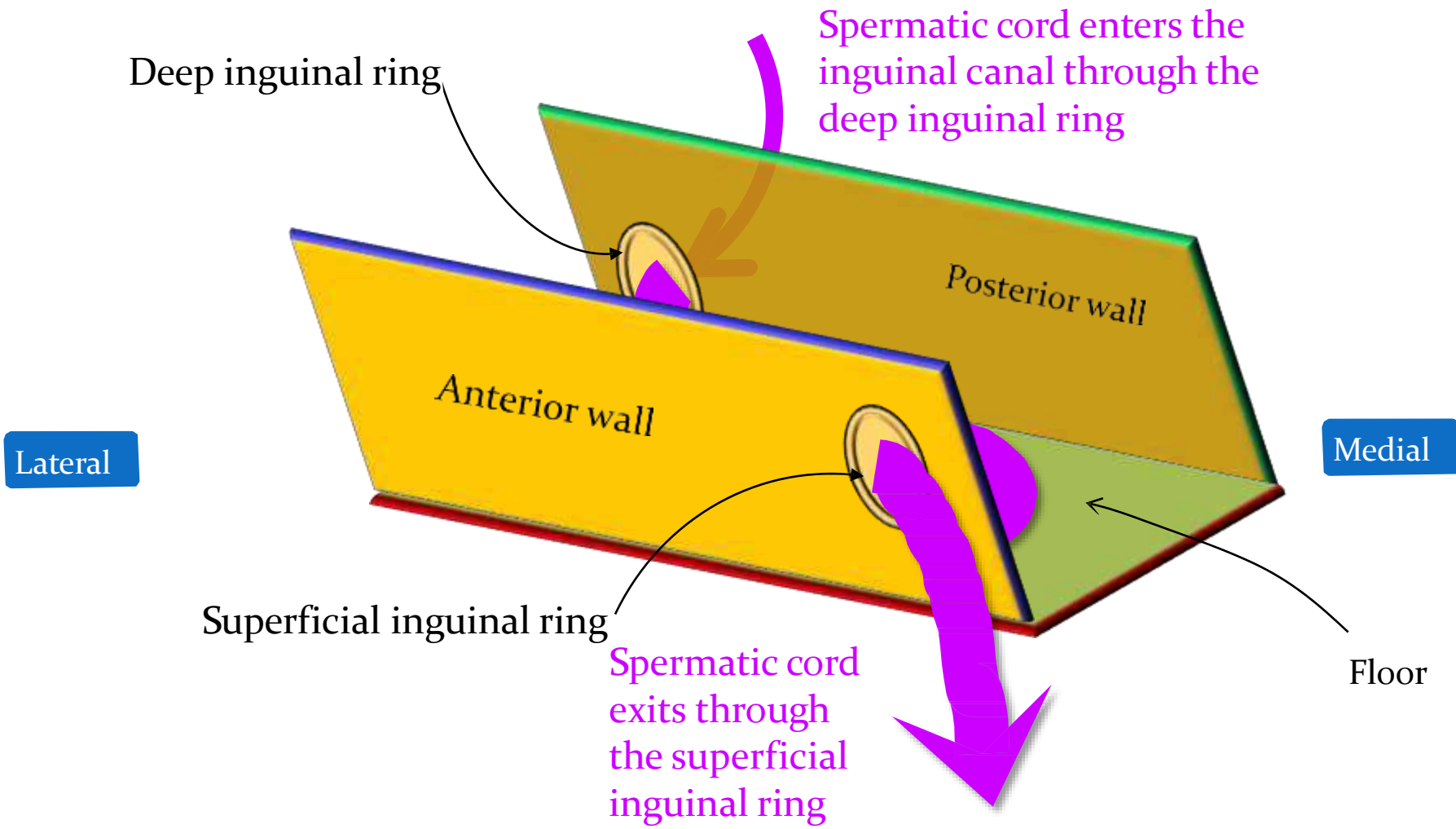
Sex Difference

The inguinal canal is larger in males than in females.

Spermatic cord

- The **spermatic cord** in males, or the **round ligament** of the uterus in females, enters the inguinal canal through the deep inguinal ring and passes out through the superficial inguinal ring.
- The **ilioinguinal nerve** enters the canal through the interval between the external and internal oblique muscles and passes out through the superficial inguinal ring.

Inguinal canal



Structures of spermatic cord

The structure of spermatic cord are:

3 Arteries:

1. Testicular artery
2. Artery to ductus deferens
3. Cremasteric artery

3 Nerves:

1. Genital br of genitofemoral
2. Ilioinguinal
3. Autonomic nerves

3 other things:

1. Ductus deferens
2. Pampiniform plexus
3. Remain of processus vaginalis

Spermatic fascia

The spermatic cord has three concentric layers of fascia derived from the layers of the anterior abdominal wall.

- External spermatic fascia: derived from the external oblique aponeurosis and attached to the margins of superficial ring.
- Cremasteric fascia: derived from the internal oblique muscle.
- Internal spermatic fascia: derived from the transverse fascia and attached to the margins of deep inguinal ring.

CLINICAL ANATOMY OF INGUINAL CANAL

Hernias

➤ Hernias are abnormal outpouchings of the abdominal contents (such as the small intestine) from the cavity in which they belong.

Types :

- ✓ Inguinal
- ✓ Femoral
- ✓ Umbilical
- ✓ Epigastric
- ✓ Incisional

➤ There are two main types of hernias that occur at the inguinal region.

1. Direct hernia
2. Indirect hernia

- The **posterior wall** of the canal is particularly weak laterally because of the deep inguinal ring
- The **anterior wall** opposite the deep ring is reinforced laterally by the **internal oblique muscles**.
- A hernia (e.g. of small bowel) that comes through the deep inguinal ring will have to travel along the inguinal canal as it cannot push into the reinforced layers of muscle in the anterior wall of the canal directly opposite the deep inguinal ring

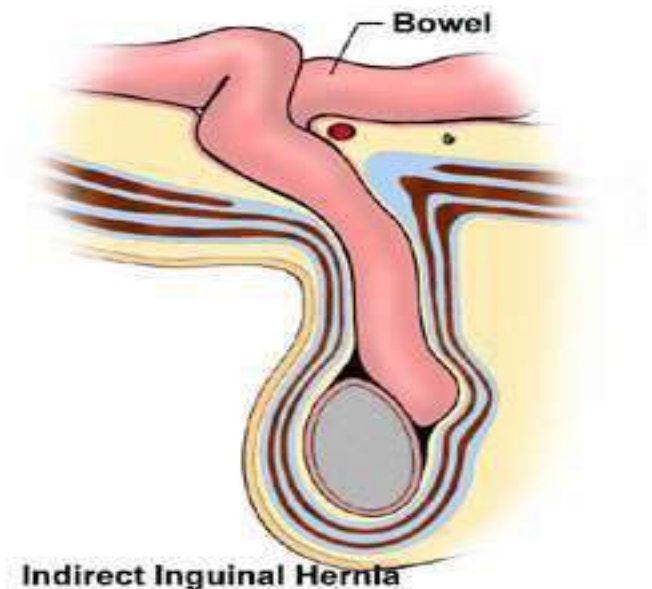
- The **anterior wall** of the canal is weak medially where the superficial inguinal ring is situated
- The **posterior wall**, opposite the superficial ring, is reinforced medially by the **conjoint tendon** that is formed by fibres of the internal oblique and transversus abdominis muscles

Indirect hernia

- These are the most common inguinal hernias, contents of the abdomen enter the deep inguinal ring and traverse the whole length of the inguinal canal to come out through the superficial inguinal ring.

The indirect hernia can be summarized as

- More common than a direct hernia
- More common in males than females
- More common on right side
- Most common in children and adult
- The neck of sac is narrow.

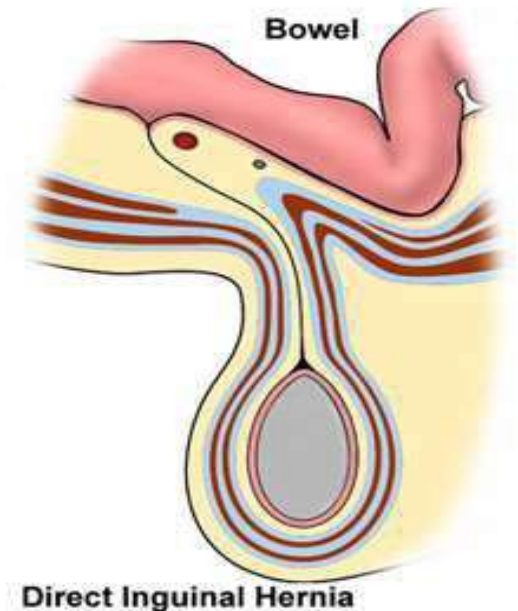


Direct Hernias

- Direct hernias occurs lateral to the epigastric vessels. They do not protrude through any ring, but through an area of weakness in the posterior wall of the inguinal canal; this area is likely to be **Hesselbach's Triangle**.
- The hernia is often parallel to the spermatic cord, but almost never enters the scrotum.

Direct hernia can be summarized as :

- Common in old men and rare in women
- The neck of sac is wide.
- Mostly bilateral.



Hesselbach's Triangle

- The **inguinal triangle (Hesselbach's triangle)** is a region in the anterior abdominal wall. It is alternatively known as the **medial inguinal fossa**.
- The inguinal triangle is located within the inferomedial aspect of the abdominal wall.

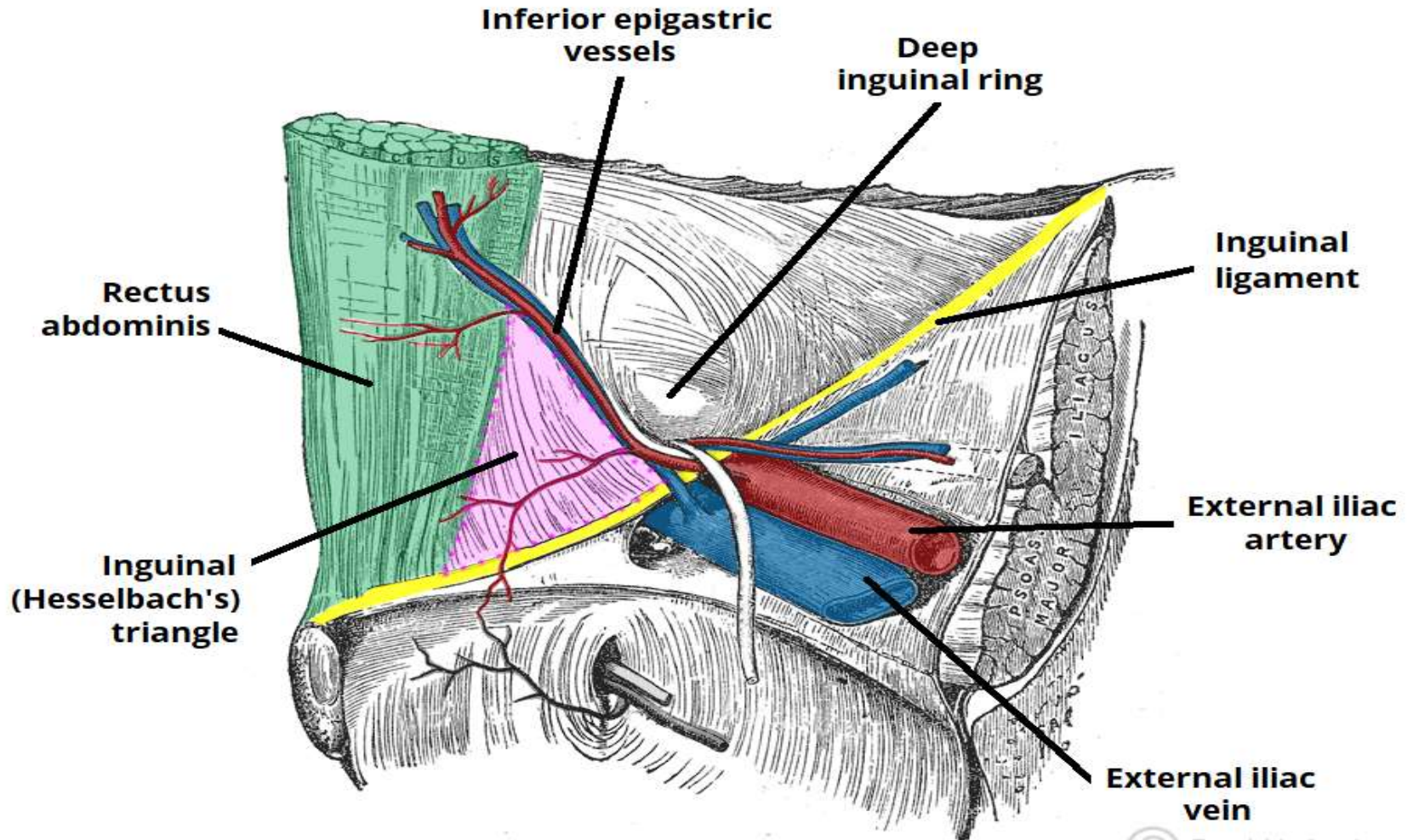
Boundaries:

- **Medial:** Lateral border of the rectus abdominis muscle.
- **Lateral:** Inferior epigastric vessels.
- **Inferior:** Inguinal ligament.

Contents

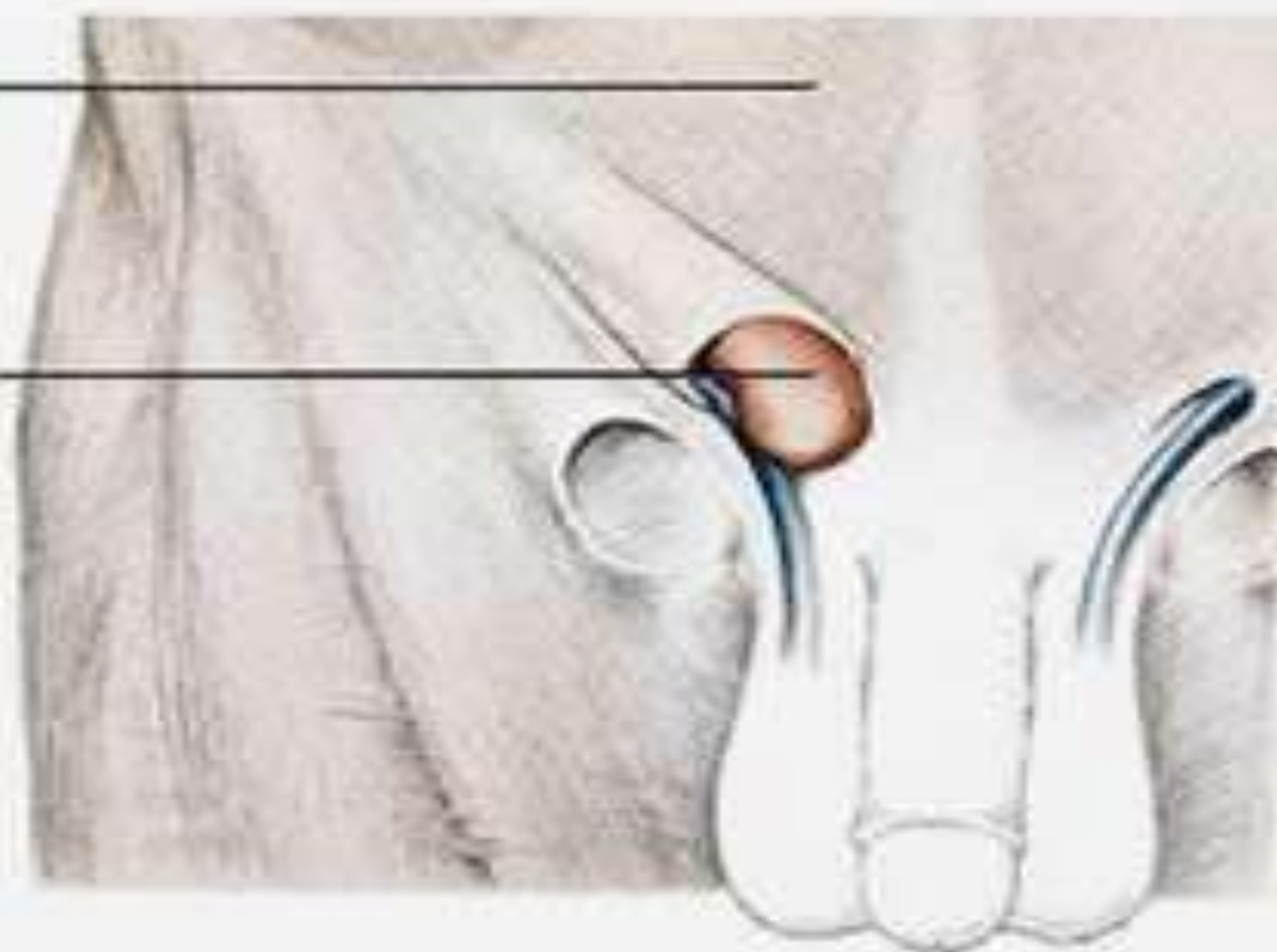
- Other than the layers of the abdominal wall, the inguinal triangle does not contain any structures of clinical importance.
- However, the triangle does demarcate an area of **potential weakness** in the abdominal wall – through which herniation (direct) of the abdominal contents can occur.

Hesselbach's Triangle



abdominal
muscles

hernia



© Martin Dunitz Ltd. 2001.

Case Scenario

- A 35-year old man was shifting to a new home. When he picked up a particularly heavy table, he suddenly felt a sharp pain in his right groin. Later, he noticed that a painful bulge had developed which disappeared when he lay on his back. He did not like going to the doctor, so he ignored the condition. After several months, the pain and the bulge in his groin increased and he finally consented to see a physician. On examination, the physician observed a swelling which began about midway between the anterior superior iliac spine and the midline, progressed medially for about 4 cm, and then turned toward the scrotum.

- What is the diagnosis?

- The indirect inguinal hernia traverses the inguinal canal. Indirect inguinal hernia sacs enter the canal at the deep inguinal ring lateral to the inferior epigastric vessels. It may or may not extend through the superficial inguinal ring and into the scrotum or labium majus.

- Difference between direct and indirect hernia.

COMPARISON OF INDIRECT AND DIRECT INGUINAL HERNIAS

Indirect

Traverses the whole length of inguinal canal

It occurs due to congenital defects of processus vaginalis

At any age but common in young

Inferior epigastric artery is medial to neck of hernial sac

Direct

Passes through Hesselbach's triangle

It is acquired

Common after the age of 40 years

The artery is lateral to neck of sac

DIFFERENCE BETWEEN INGUINAL HERNIA AND FEMORAL HERNIA

Inguinal hernia

More common in males
Above inguinal ligament
Neck of protrusion is
supero-medial to pubic
tubercle

Femoral hernia

More common in females
Below inguinal ligament
Neck of protrusion is
infero-lateral to pubic
tubercle

Thank You