ABDOMINAL WALL MUSCLES
EXTERNAL & INTERNAL OBLIQUE

EXTERNAL OBLIQUE
From: ant angles last 8 ribs.
To: xiphisternum, linea alba, pubic symphysis & crest, inguinal lig, ant 1/2 iliac crest.
Fibres: down/medial
N: T7-12

INTERNAL OBLIQUE
From: ant. 2/3 iliac crest, lat 2/3 inguinal lig, lumbar fascia
To: costal margin, rectus sheath.
Conjoint tendon (CT) on pubic crest & pectineal line.
Fibres: Upward/medial
N: T7-12, ilioinguinal to CT
ABDOMINAL WALL - THORACOLUMBAR FASCIA, NEUROVASCULAR PLANE & FASCIA OVER INGUINAL REGION

Neurovascular plane between two muscles as indicated

Transversus abdominis

External oblique

Thoracolumbar fascia. Note that external oblique does not attach to it, hence free edge

Erector spinae

Internal oblique

Psoas

Scarpa's fascia of abdomen attaches to fascia lata of thigh 2-3cm below inguinal ligament

Inguinal ligament

FASCIA IN INGUINAL REGION

fascia lata of thigh

Posterior

Anterior
**ABDOMINAL WALL MUSCLES**

**TRANSVERSUS, RECTUS ABDOMINIS, PYRAMIDALIS**

**TRANSVERSUS ABDOMINIS**
From: costal margin, lumbar fascia, ant 2/3 iliac crest, lat 1/2 inguinal lig
To: rectus sheath, linea alba, CT to pubic crest & pectineal line
Fibres: transverse
N: T7-12, ilioinguinal to CT

**RECTUS ABDOMINIS**
From: pubic crest, tubercle & symphysis
To: costal cartilages 5,6,7, costal margin of 7, sternum & diaphragm
N: T7-12
(note: 3 morphological layers)

**PYRAMIDALIS**
From: front of body of pubis
To: linea alba
N: T12 (subcostal)

3 Tendinous intersections
(rarely 4)
Fusion to anterior sheath

Diaphragm

Xiphoid
ABDOMINAL WALL MUSCLES & RECTUS SHEATH

EO External oblique
IO Internal oblique
TA Transversus abdominis
TF Transversalis fascia

Actions of abdominal muscles:
• Truncal movements
• Rib depression
• Visceral support
INGUINAL LIGAMENT

- Anterior superior iliac spine
- Edge curled under
- Pubic tubercle
- Pectineal line
- Pubic body
- Pubic crest
- Pubic ramus

Lacunar ligament: Extends upwards/backwards onto pectineal line along which it extends to become the pectineal ligament (of Astley Cooper)

MID POINT OF INGUINAL LIGAMENT (lower free edge of external oblique abdominis)

- ASIS
- Deep inguinal ring
- Pubic tubercle

MID INGUINAL POINT
(1/2 way between ASIS and pubic symphysis)

- Anterior superior iliac spine (ASIS)
- Femoral artery
- Lacunar ligament
- Pubic symphysis

External (superficial) inguinal ring

Ilioinguinal nerve lies on the internal oblique in canal

Iliohypogastric nerve

Medial crus to symphysis

Reflected part of inguinal ligament
(from lateral crus to linea alba)

Lateral crus to pubic tubercle

Intercrural fibres
INGUINAL CANAL

A 4cm tunnel in the lower, anterior abdominal muscles that runs downwards and medially between the deep and superficial inguinal rings.

Anterior wall: external oblique, & internal oblique for lateral 1/3
Roof: Arcing fibres of internal oblique & transversus
Posterior wall: transversalis fascia & conjoint tendon
Floor: inguinal ligament

Deep inguinal ring is a hole in the transversalis fascia lying 3cm superior to the mid point of the inguinal ligament.

Superficial inguinal ring is a V-shaped defect in the lower, medial fibres of the external oblique, just superior and lateral to the pubic tubercle.

RIGHT INGUINAL REGION

Arrows show 2 areas of “reinforcement” for superficial and deep ring

EXPLoded INGUINAL CANAL

- Arrows indicate sites of weakness at deep ring (indirect hernia) and at transversalis fascia lateral to conjoint tendon (direct hernia).
- Dotted lines indicate the 2 layers that support both the deep and superficial inguinal rings.
**Note:** If the obturator artery is missing then the superior pubic branch of the inferior epigastric takes over. This artery is then called an abnormal (aberrant) obturator artery. Whether or not an abnormal obturator artery is present, the superior pubic branch of the inferior epigastric may run anteromedial to the sac of a femoral hernia in the femoral ring. If so, it can easily be damaged during a hernia repair. In this illustration it runs posterolateral and is thus not a hazard.
ILIOHYPOGASTRIC, ILIO-INGUINAL & GENITOFEMORAL NERVES

ILIOHYPOGASTRIC NERVE
- Main branch of L1
- Sensory and motor
- Pierces internal oblique above anterior superior iliac spine
- Pierces external oblique above superficial inguinal ring
- Supplies: Upper buttock (lateral cutaneous branch)
  - Transversus & internal oblique (lowest fibres)
  - Skin of mons pubis

ILIOINGUINAL NERVE
- Muscular collateral branch of L1
- Motor and sensory
- Pierces internal oblique above anterior superior iliac spine
- Supplies: Transversus & internal oblique (lowest fibres)
- Conjoint tendon
- Then enters inguinal canal from above/lateral and leaves via superficial inguinal ring
- Supplies: Upper medial thigh, anterior 1/3 scrotum, labia majora and root of penis

Genital branch of genitofemoral (L2). Supplies cremaster muscle, all spermatic fascia & tunica vaginalis, +/- a small area of scrotum

CUTANEOUS NERVE SUPPLY OF BUTTOCKS

Note that the POSTERIOR RAMI of C1, L4.5, S4.5 and the coccygeal nerves do not reach the skin