

Exploring anatomy: the human abdomen

An advanced look at the inguinal canal transcript

Welcome to this video for exploring anatomy, the human abdomen. This video is going to outline the inguinal canal.

So on the screen at the moment, we've got the anterior superior iliac spine and also the pubic bone. Here in the midline, we've got the pubic symphysis. And here, we can see the superior pubic ramus that has the public tubercle here.

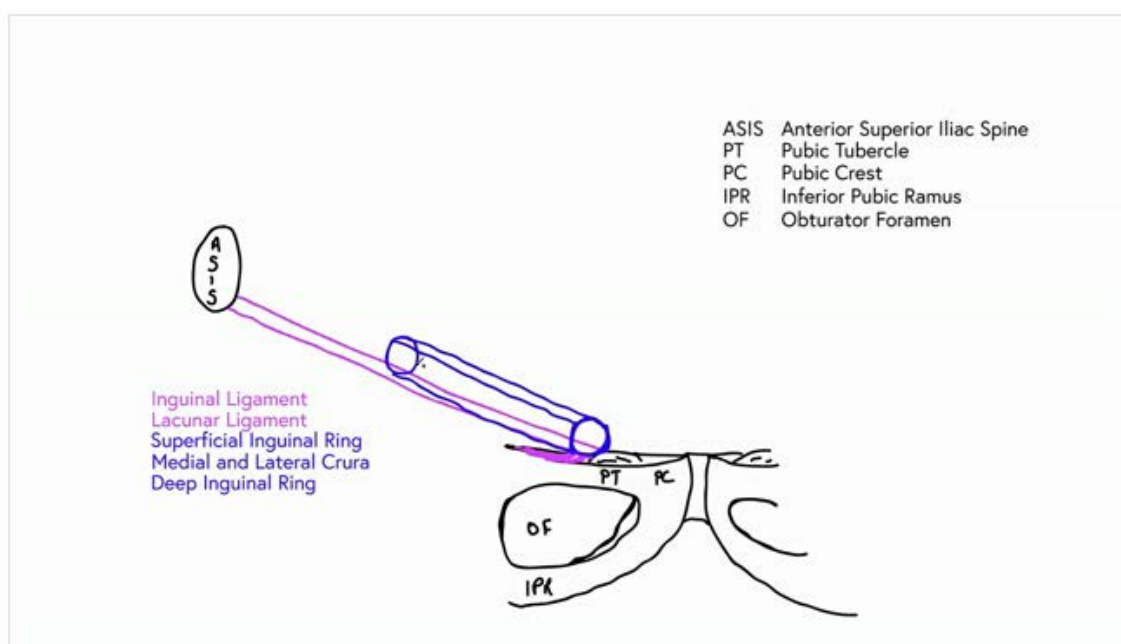
And here, we can see the pubic crest. This is the inferior pubic ramus. And here's the obturator foramen.

So the first thing I'm going to draw out is the inguinal ligament. And the inguinal ligament forms the floor of the inguinal canal. So here we have the inguinal ligament-- the inguinal ligament.

This forms the floor of the inguinal canal. It's the free edge of the external oblique muscle fibres, which I'm not going to draw on this diagram as they overcomplicate it. But you should be aware the external oblique muscle fibres run downwards and forwards.

At the pubic tubercle, some fibres of the inguinal ligament reflect laterally and form the lacunar ligament. And some more of these fibres extend further laterally onto the pectineal line of the pubic bone. So here we're going to have the lacunar ligament, this lateral reflection of the inguinal ligament. Some fibres of the inguinal ligament also reflect superiorally and medially to blend with the muscles of the anterior and lateral abdominal wall. But I won't draw those in.

So like I said, I'm not actually going to draw in external oblique muscle or its aponeurosis. But I need to drawn in a specific aspect of it, which is a defect in external oblique aponeurosis, just found supralateral to the pubic tubercle. And this is the superficial inguinal ring-- so the superficial inguinal ring.



The superficial inguinal ring is thickened laterally and medially by the medial and lateral crura. And these are thickenings on the medial and lateral aspect of the inguinal ring, to help reinforce it and to

prevent it from splitting-- the medial and the lateral crura. So the superficial inguinal ring is a slit in external oblique aponeurosis.

We've got a superficial inguinal ring. We're also going to have a deep inguinal ring. And this is located about halfway along the inguinal ligament. And here we can have, running from the deep inguinal ring to the superficial inguinal ring, we can draw in the inguinal canal. So here we can see this inguinal canal, this passageway that's running obliquely through the anterior abdominal wall.

The deep inguinal ring is where the spermatic cord passes through in the male and the round ligament of the uterus passes through in the female. They then pass through the inguinal canal and exit the superficial inguinal ring, to pass to the testes and the scrotum, or the labia majora if you're a female. So, the deep inguinal ring and the superficial inguinal ring.

So now, let's start drawing the boundaries of this inguinal canal. So the anterior wall, along the entire length of the canal, is formed by external oblique muscle and its aponeurosis. But I'm not going to draw that in because it will then shield everything else. Then you wouldn't be able to see the other boundaries. So I'm going to leave external oblique and just hope that you can remember that external oblique is running downwards and forwards and having this defect, which is a superficial inguinal ring.

What I can draw in is internal oblique. Internal oblique is coming from the half of the inguinal ligament. And it runs upwards and forwards. So its fibres are running perpendicular to external oblique. And it's originating from the inguinal ligament.

And as it does come from the inguinal ligament, it actually forms part of the anterior wall of the inguinal canal. We can see it here coming off the inguinal ligament and running anterior to inguinal canal.

Now most of the fibres will run towards the midline, where they'll form the rectus sheath. But these lower fibres actually curve over the inguinal canal to help form its roof. So these fibres we can see here, coming off the inguinal ligament, these internal oblique fibres are running anterior to the inguinal canal and then running over the contents. So they're running over the spermatic cord or the round ligament, to form the roof of the inguinal canal.

These fibres then pass behind the inguinal canal and attach to the pubic tubercle. So I'll just draw in these ones here in dotted lines, so hopefully you can appreciate that these are now running behind the inguinal canal. So they're now medially forming the posterior wall.

If I just reinforce the superficial inguinal ring and part of the inguinal canal, then hopefully this will become a bit clearer. So hopefully now, you can appreciate that these dotted lines are running posterior to the inguinal canal.

Internal oblique, in orange-- I'll just make it here, "I-O," internal oblique-- forms the anterior wall of the lateral third of the inguinal canal. And then it forms the roof and then it forms the posterior wall.

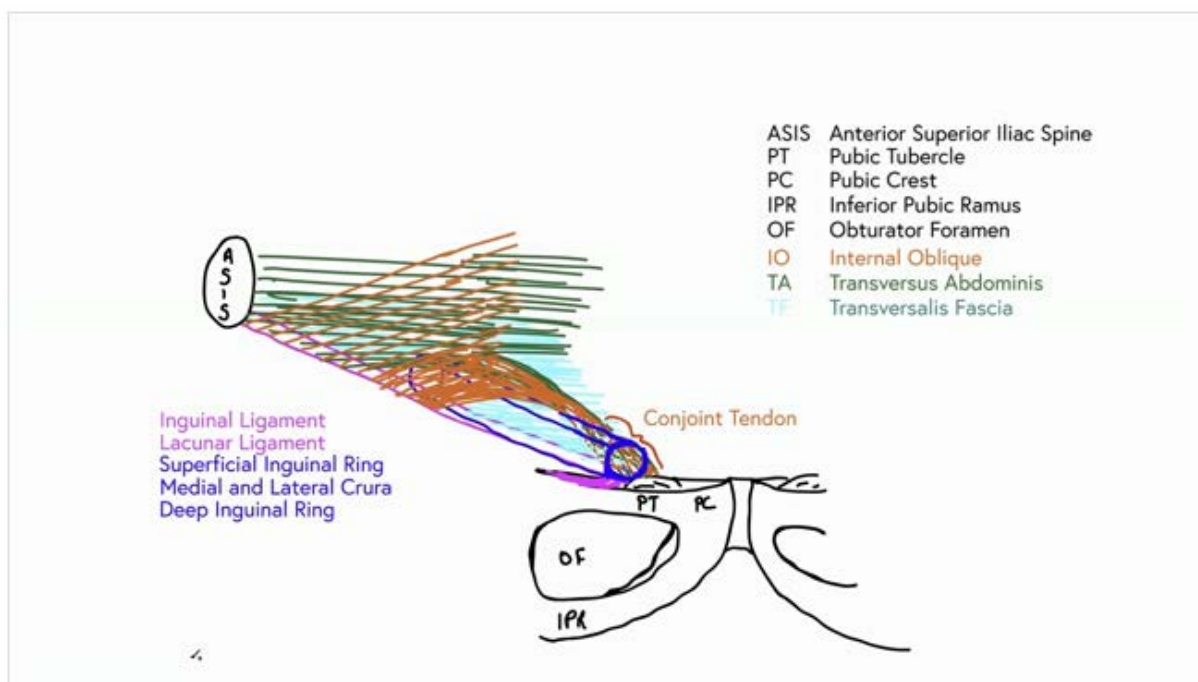
If we now turn to transverse abdominis, transverse abdominis is the deepest of the three anterolateral abdominal wall muscles. And this also comes from the inguinal ligament, it's lateral third. And its fibres run transversely across the abdominal wall. So its fibres are running deep to internal oblique and they're running transversely across.

They also go to the midline, where they help form the rectus sheath. But these fibres, some of them, also curve posteriorly over the inguinal canal. And they're helping internal oblique to form the roof of the inguinal canal. So these fibres are now running alongside internal oblique. And we can see them running behind the inguinal canal. So these fibres are running behind the inguinal canal.

So now we can see that, in green, transverse abdominis muscle is forming the roof and then forming the posterior wall of the inguinal canal. Where? Transverse abdominis in green and internal oblique in orange join the pubic tubercle. Where they attach to the pubic tubercle, these two muscle layers actually fuse. So that directly behind the superficial inguinal ring, they're fused to form the conjoint tendon.

So directly posterior to the superficial inguinal ring, we have the conjoint tendon. This reinforces the weakness that is the superficial inguinal ring on the anterior abdominal wall.

Running most posterior is the transversalis fascia. And hopefully, if I draw this in enough, you can see that most posteriorly, in blue, we find we have the transversalis fascia. And this forms all of the posterior wall. Throughout the whole length of the inguinal canal, we can see transversalis fascia. Transversalis fascia, the layer between transverse abdominis and the parietal peritoneum.



So in this light blue, we can see transversalis fascia. And that forms the posterior wall of the inguinal canal.

[end of transcript]