

Abdomen dissection visual manual

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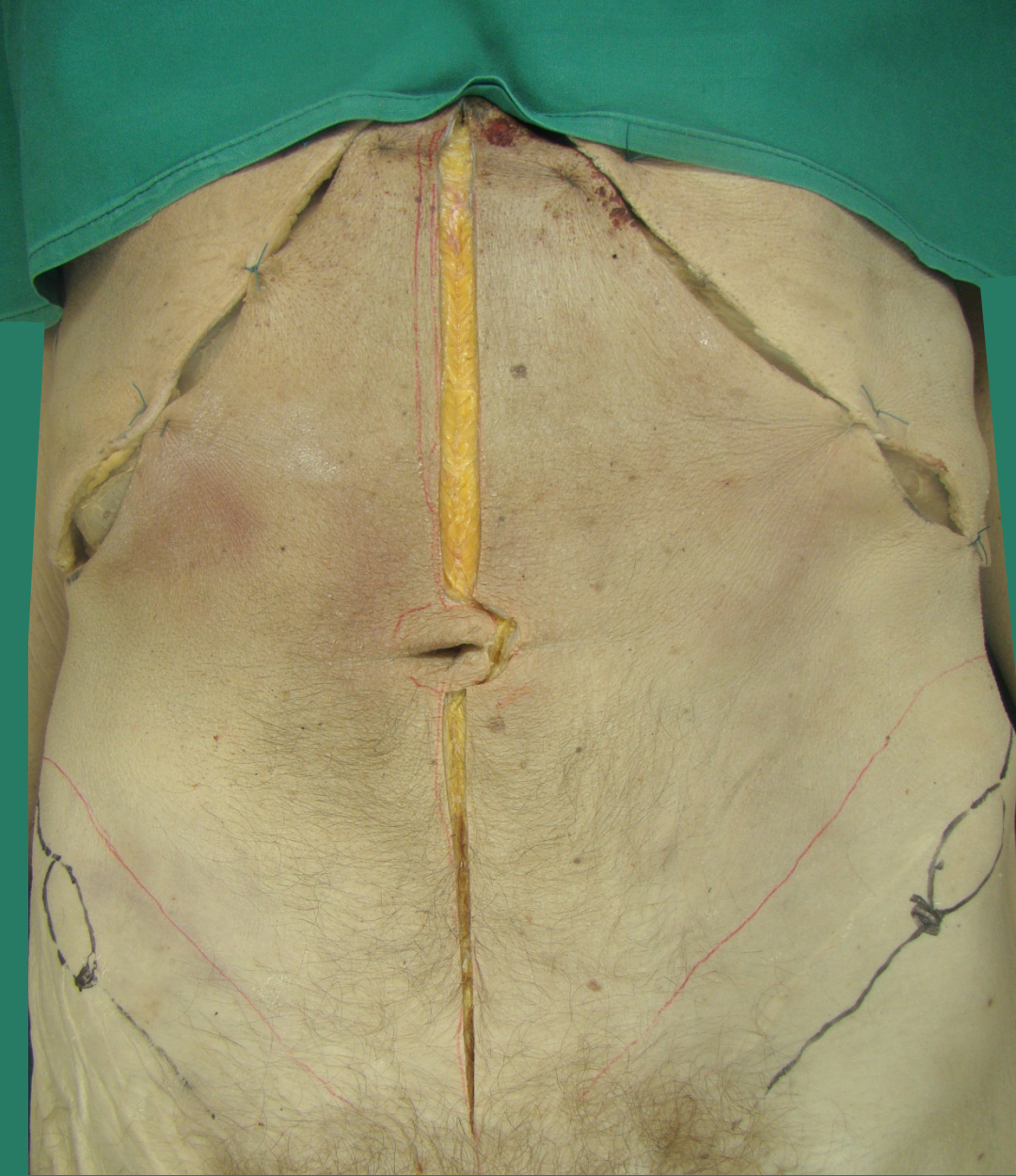
Skin and fasciae

Abdomen

with incision lines
indicated



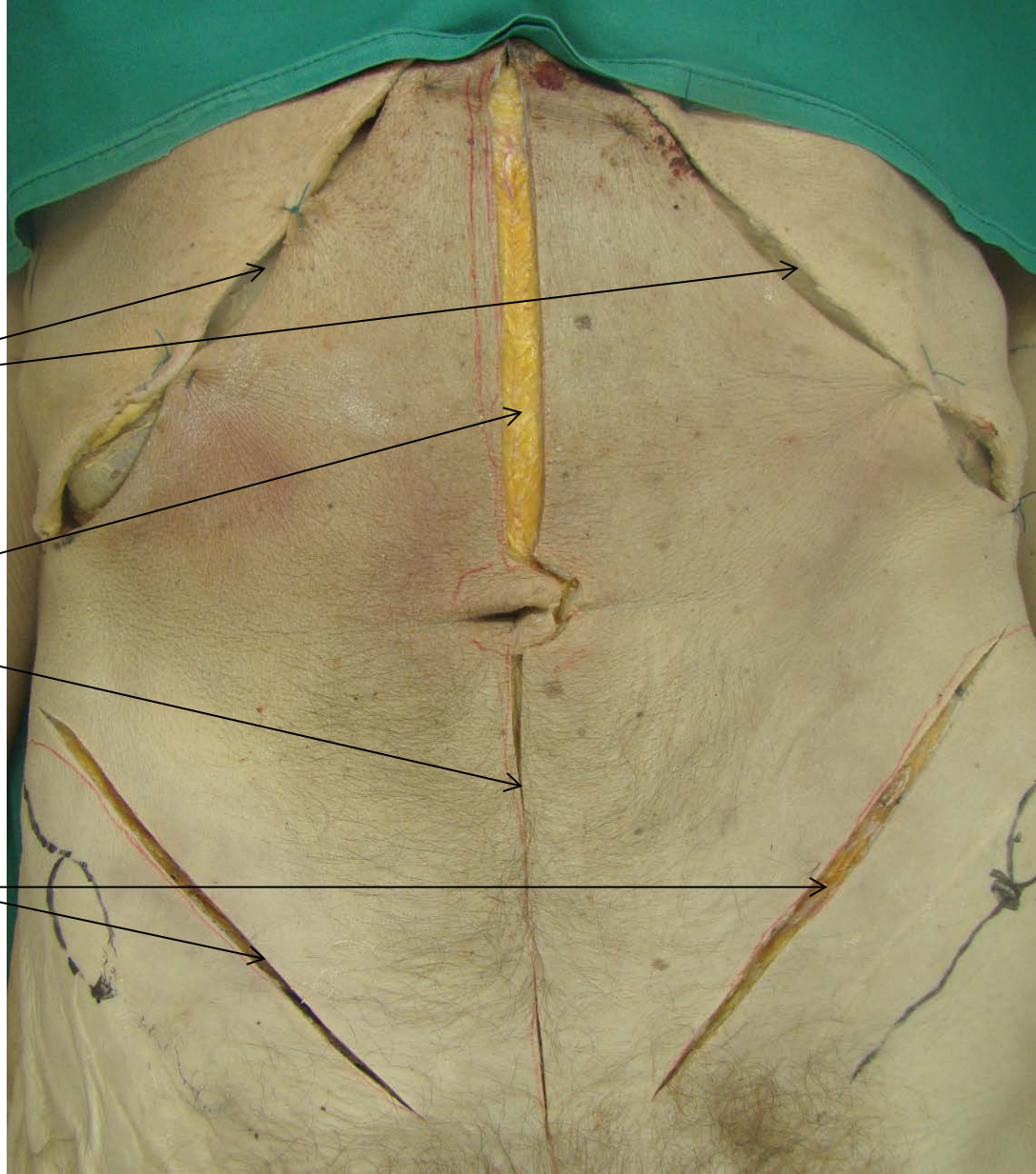
Median incision



Subcostal incision

Median incision

Both side groin incision



Superficial fascia



Superficial fatty fascia
(Camper's fascia)



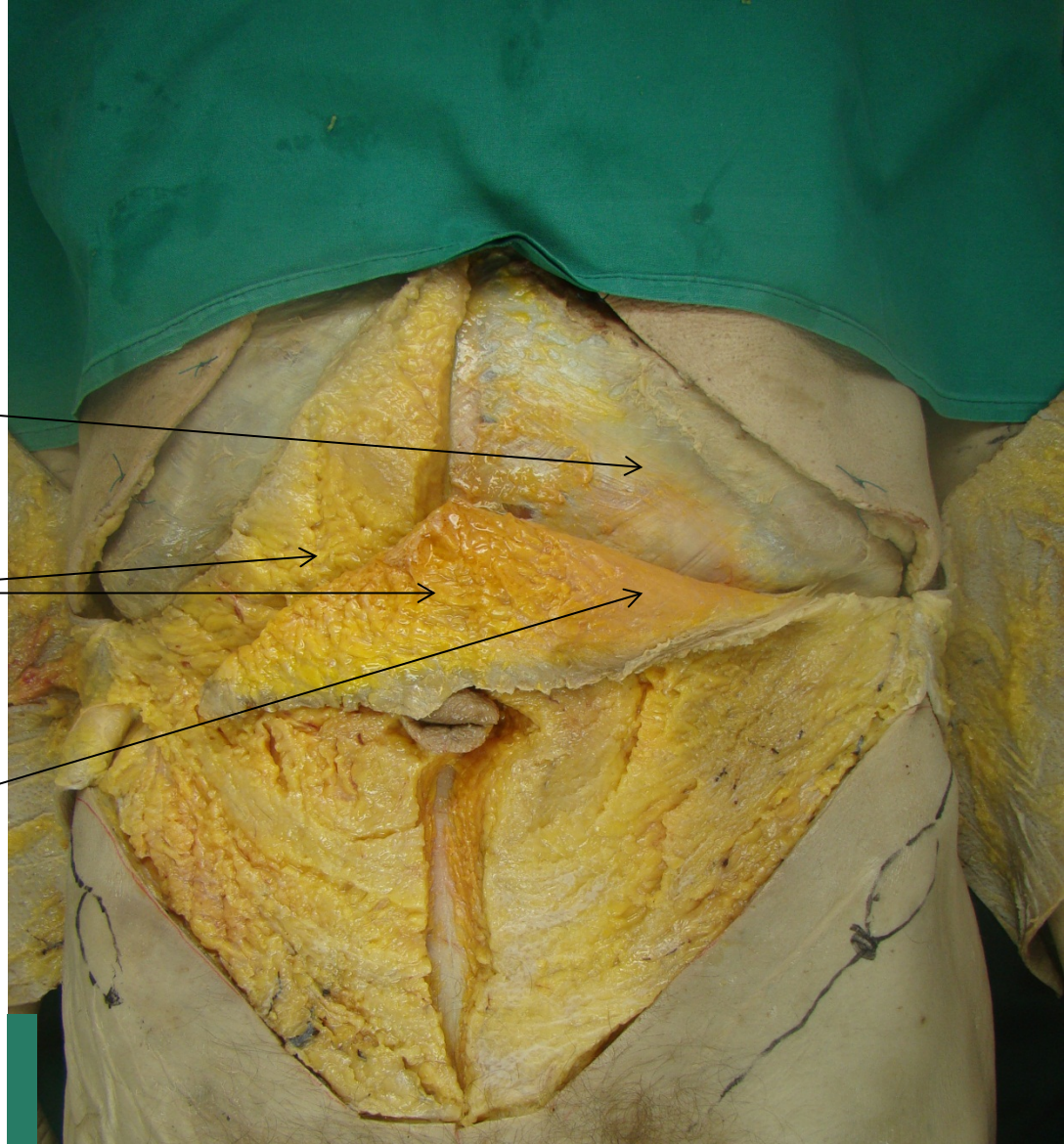
Superficial fatty fascia
(Camper's fascia)



Fascia over external
abdominal oblique
muscle

Camper's fascia
(superficial, fatty)

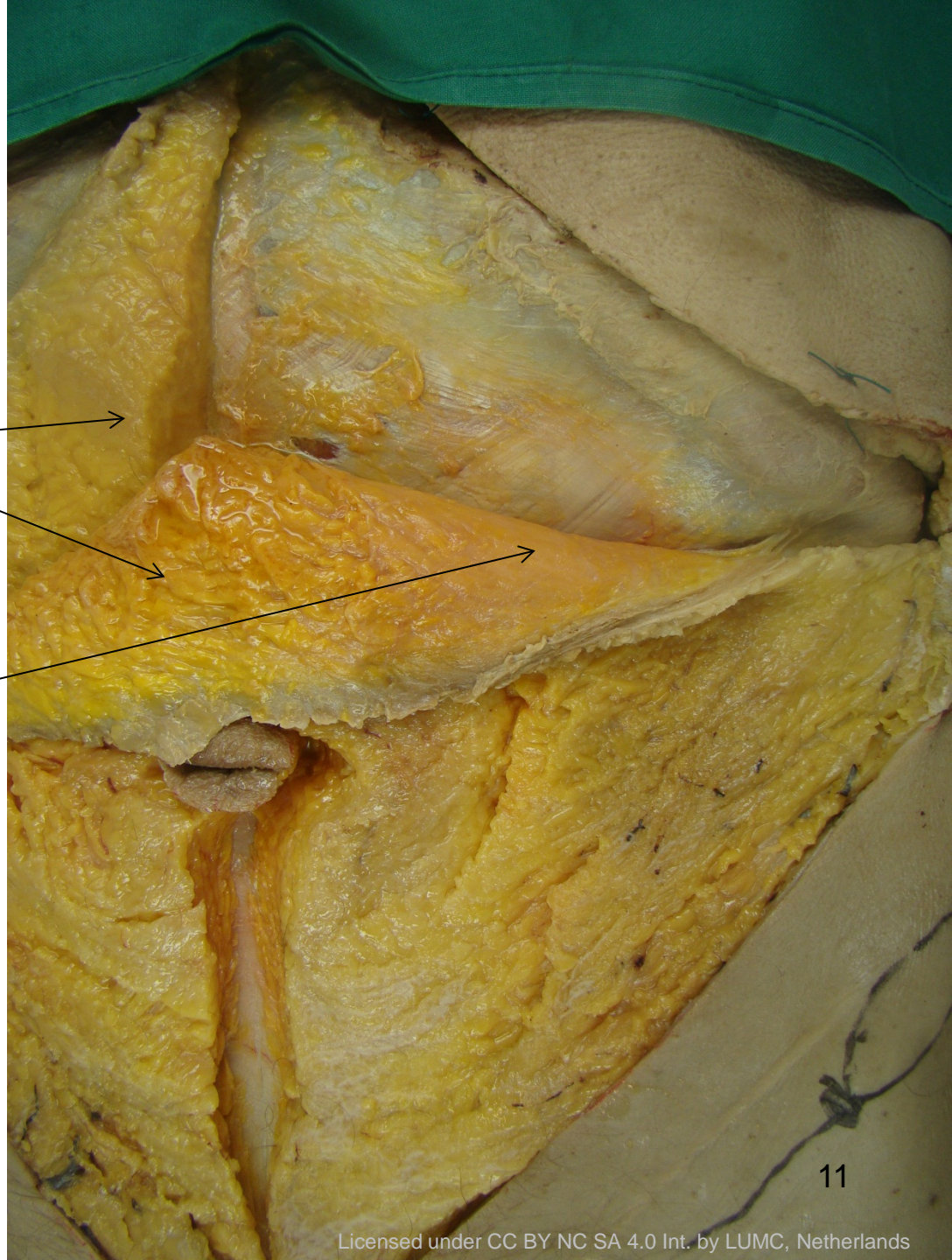
Scarpa's fascia
(deep, membranous)
(the shiny continuous tissue)



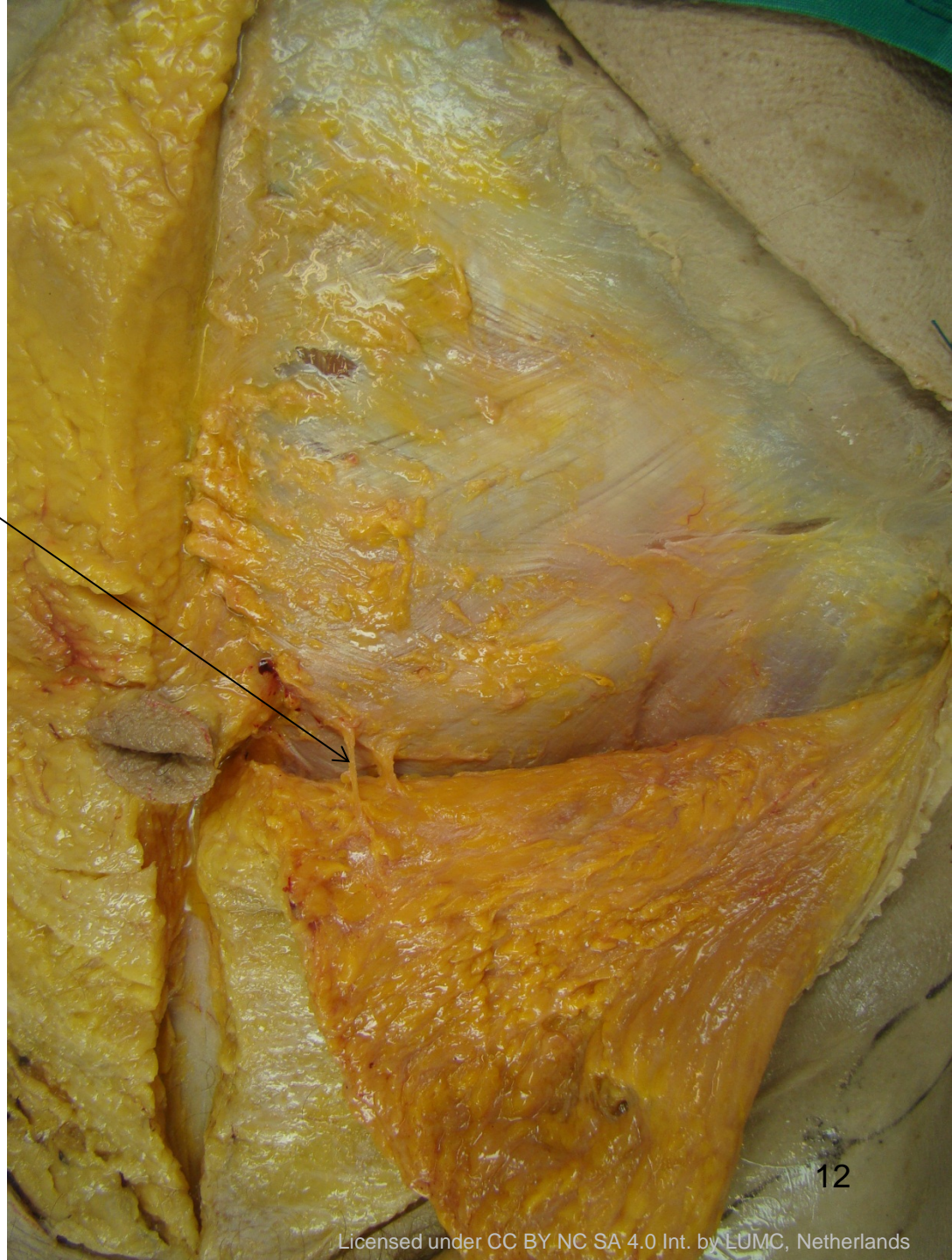
Closeup

Camper's fascia
(superficial, fatty)

Scarpa's fascia
(deep, membranous)
(the shiny continuous tissue)

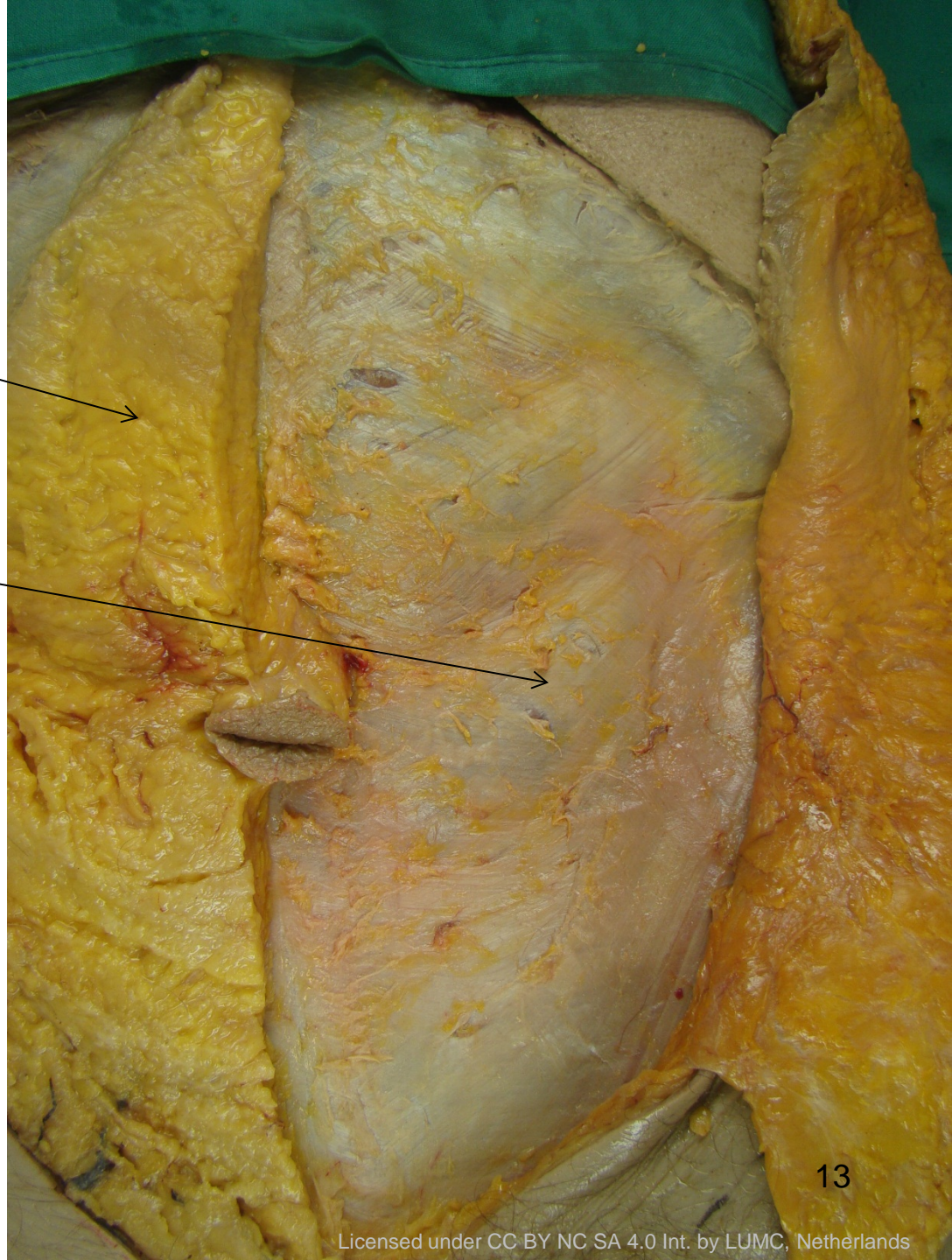


Anterior cutaneous
branches of intercostal
nerves (T10)



Camper's fascia
(superficial fatty layer)

Fascia



Superficial fatty layer
removed on both sides,
looking on fascia



Fascia

Aponeurosis (1) of external abdominal oblique muscle contributing to *Anterior sheath* of rectus abdominis muscle

Aponeurosis (2) of external abdominal oblique muscle

Fascia (3) over external abdominal oblique muscle


(these are all continuous)

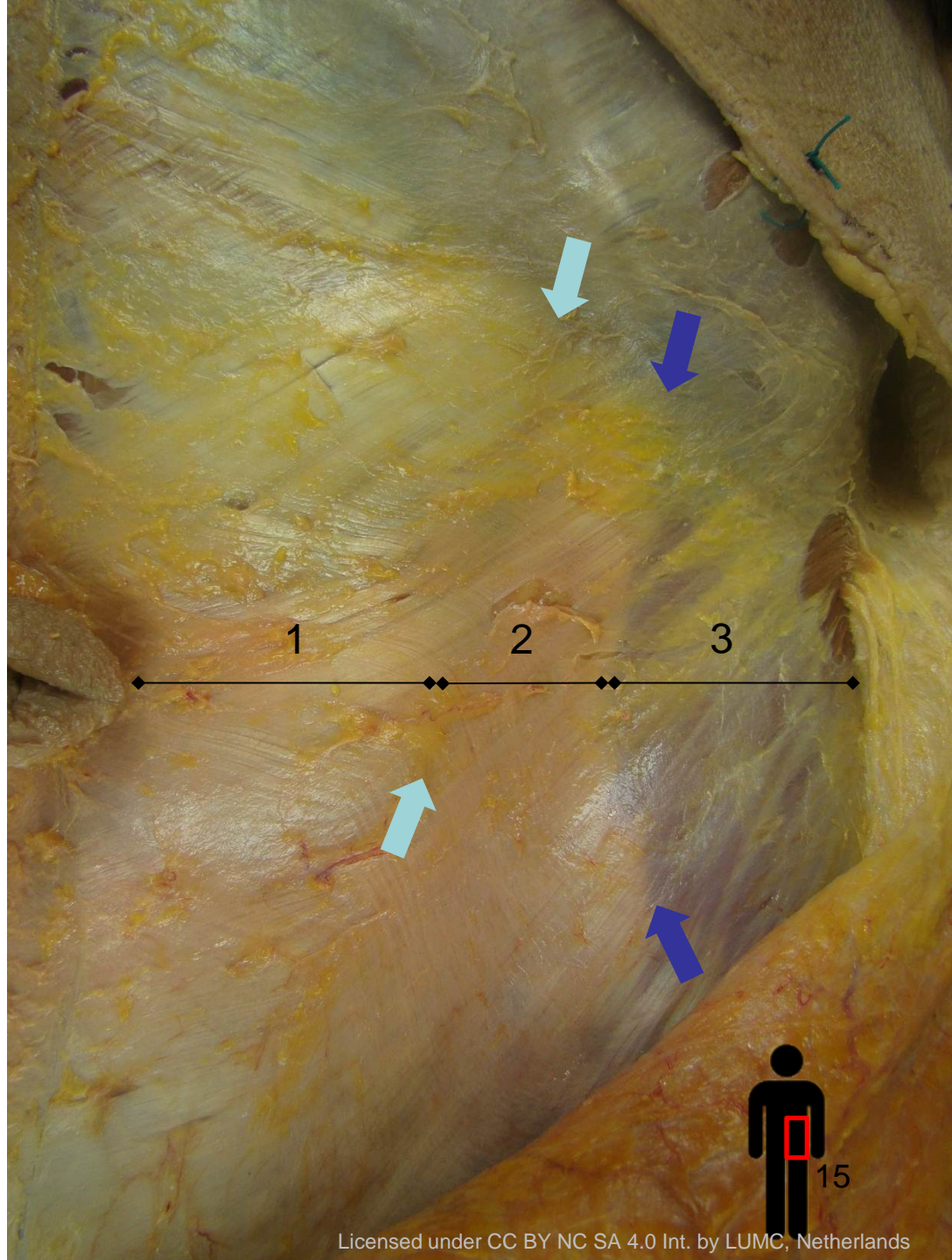
Linea semilunaris

(Spiegel's line)

= definitions vary:

lateral rectus border  or

transition  of oblique and transverse muscles to their aponeuroses – draw imaginary line between blue arrows



Rectus abdominis muscle and sheath

Opening of the anterior rectus sheath



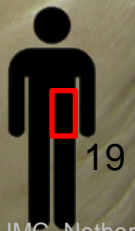
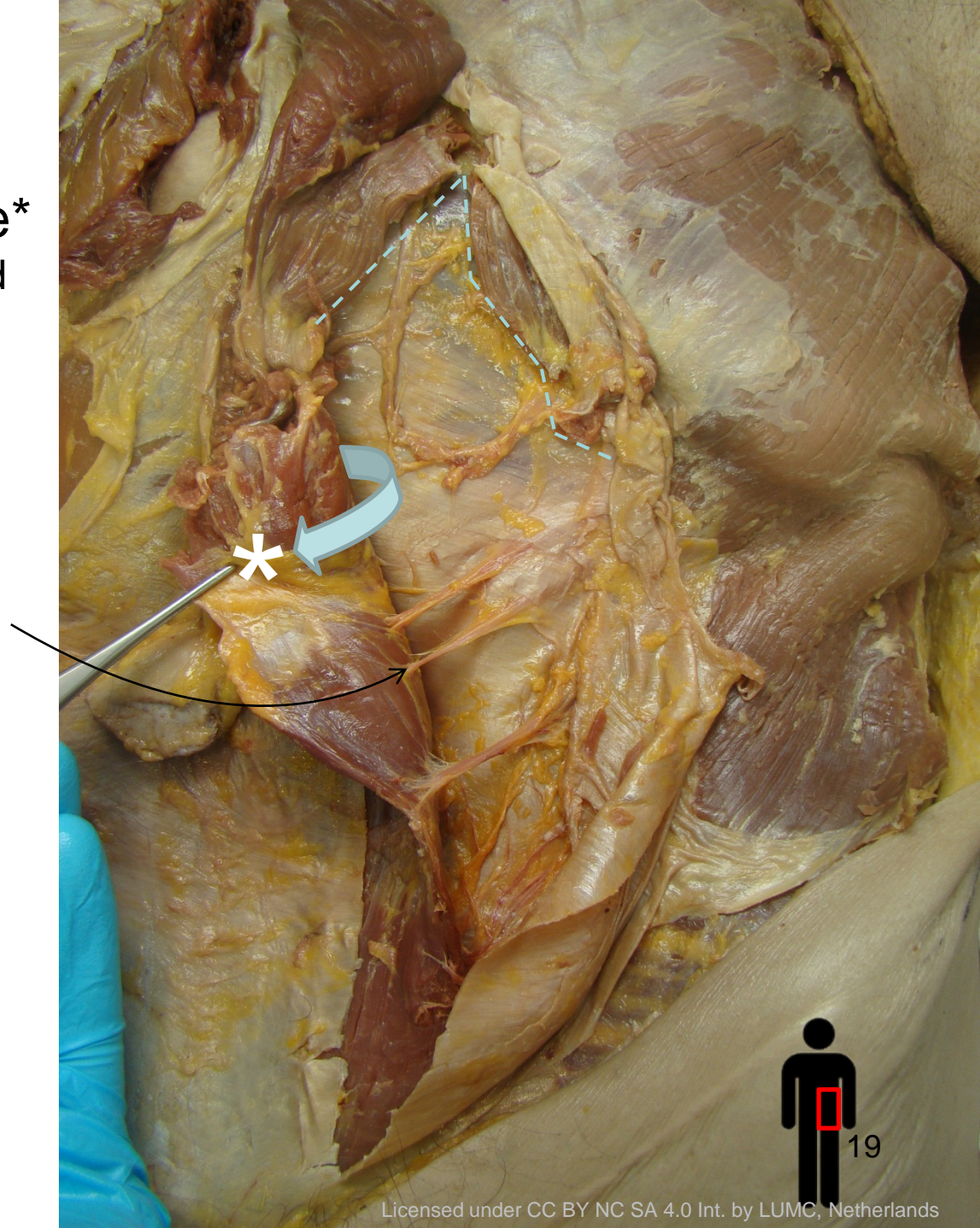
Rectus abdominis muscle and its intersections



Rectus abdominis muscle*
cut (blue dashed line) and folded
medially (blue arrow)

innervated by

anterior cutaneous
branches of
thoracoabdominal
(or intercostal) nerves
(T7-T12)

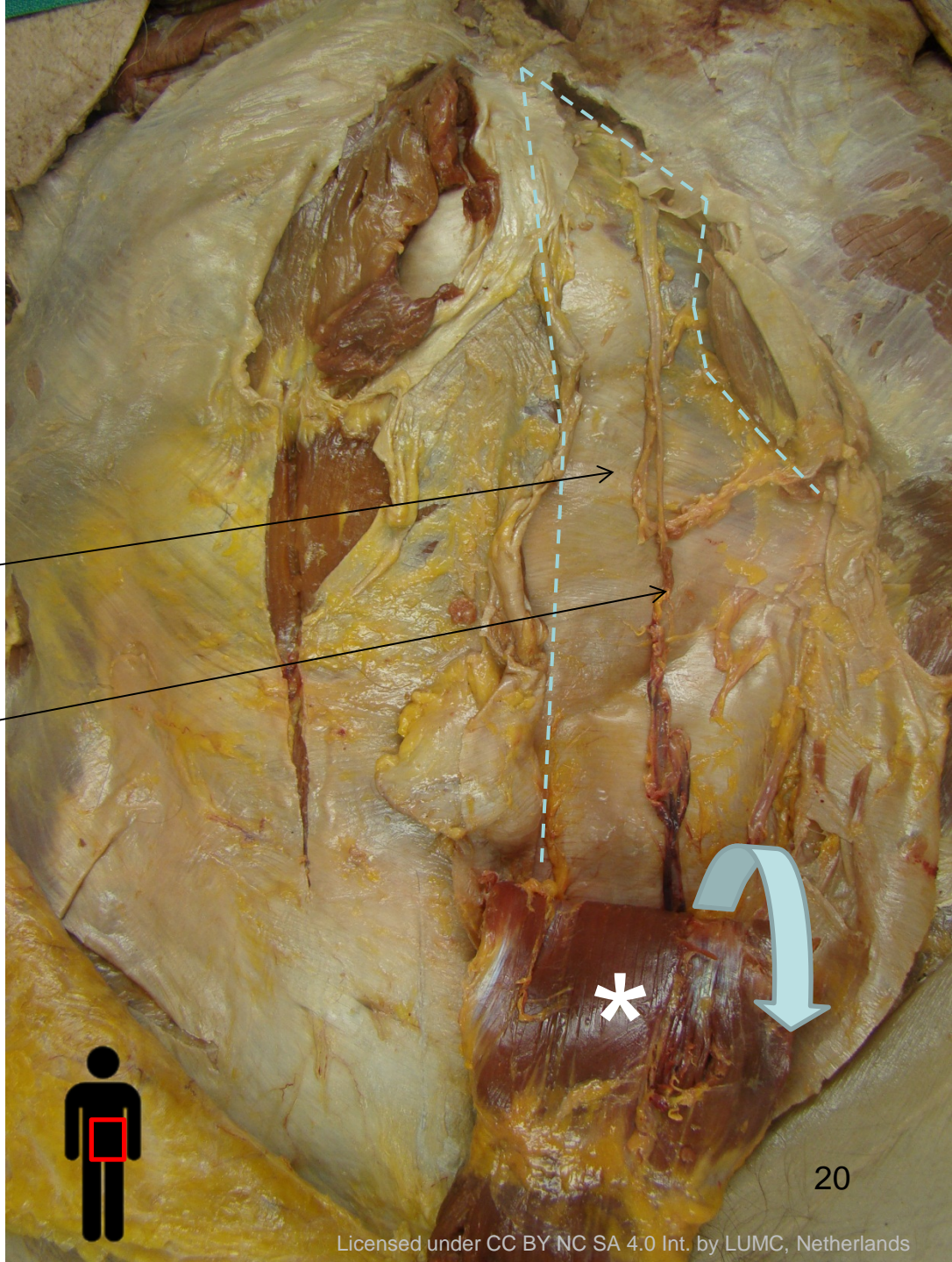


Rectus abdominis muscle*
cut (blue dashed line) and folded
caudally (blue arrow)

exposing

Posterior rectus sheath

Superior epigastric
vessels (artery and vein)



Closeup

Superior and inferior
epigastric arteries and
veins



'Lines'

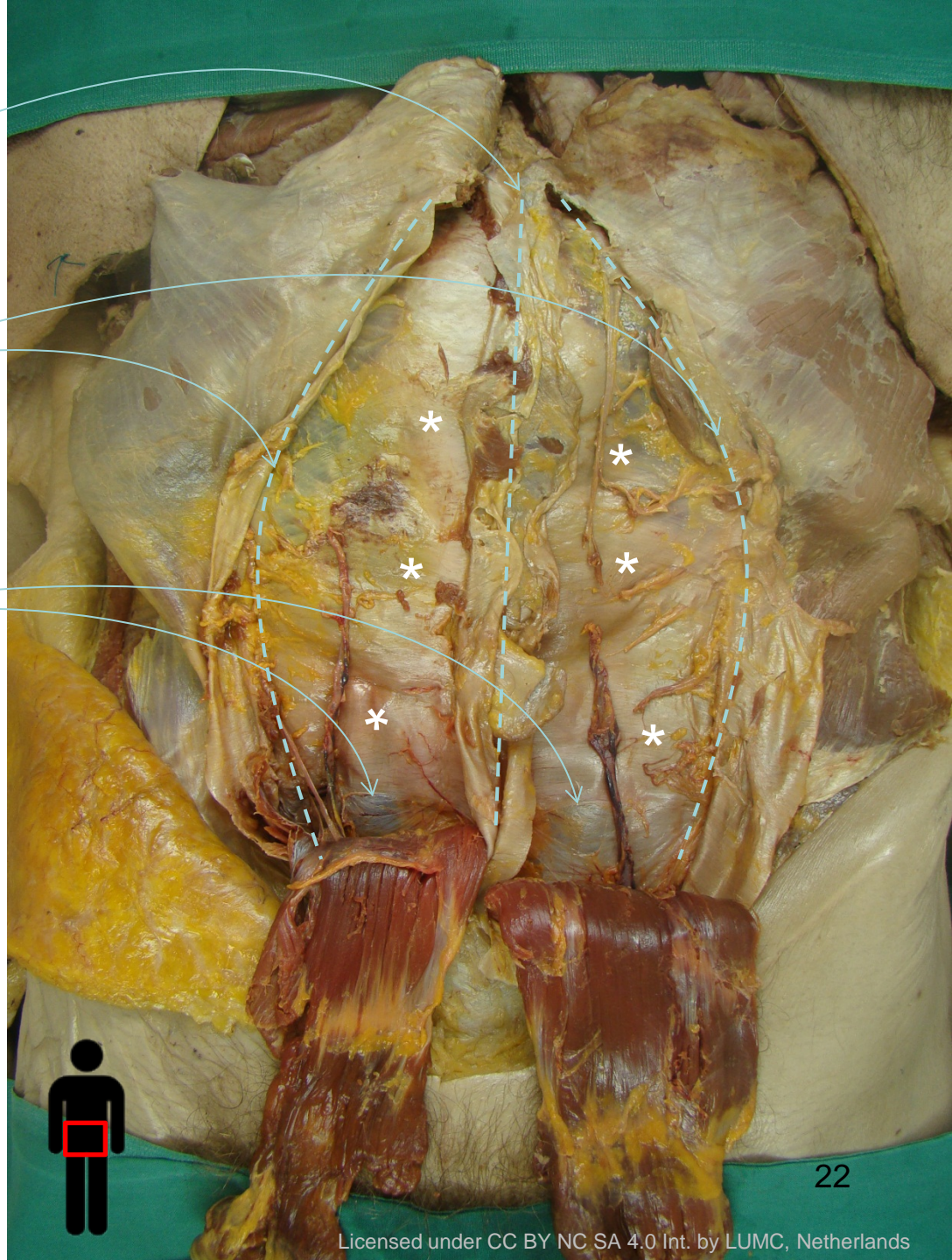
Linea alba

Linea semilunaris
(Spiegel line)

Linea arcuata
(Linea semicircularis,
Douglas line)

Posterior rectus sheath*

Note: linea arcuata is often (as here) not a very clear-cut line, but more a thinning of the tissue



Closeup

Posterior rectus sheath

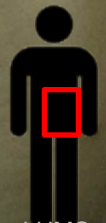
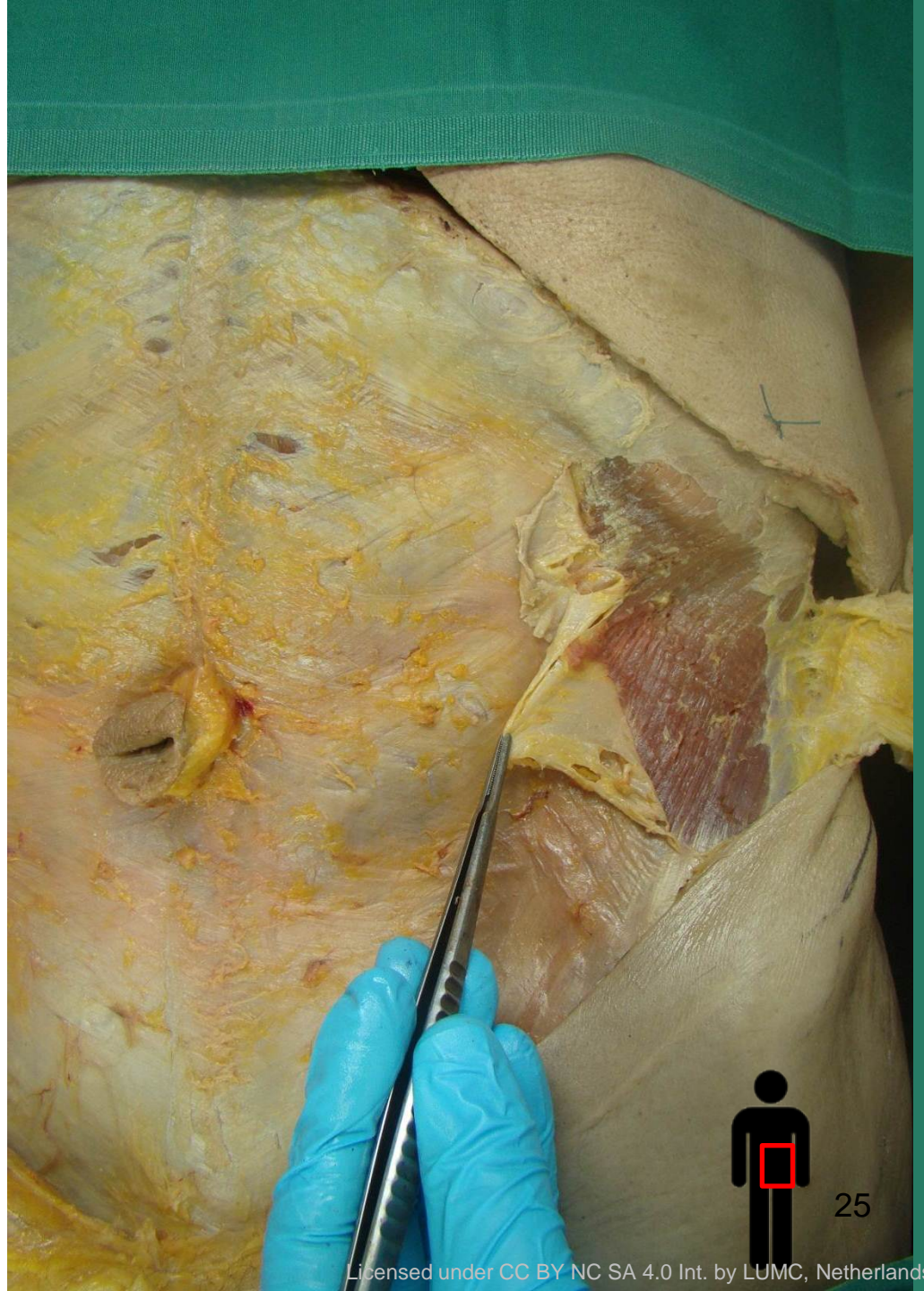
Linea arcuata
(Linea semicircularis,
Douglas line)



Lateral muscles of abdominal wall

Fascia opened over
External abdominal
oblique muscle
Note fibre direction

(note: the fascia is
continuous with
aponeurosis)



External abdominal
oblique muscle
Note fibre direction



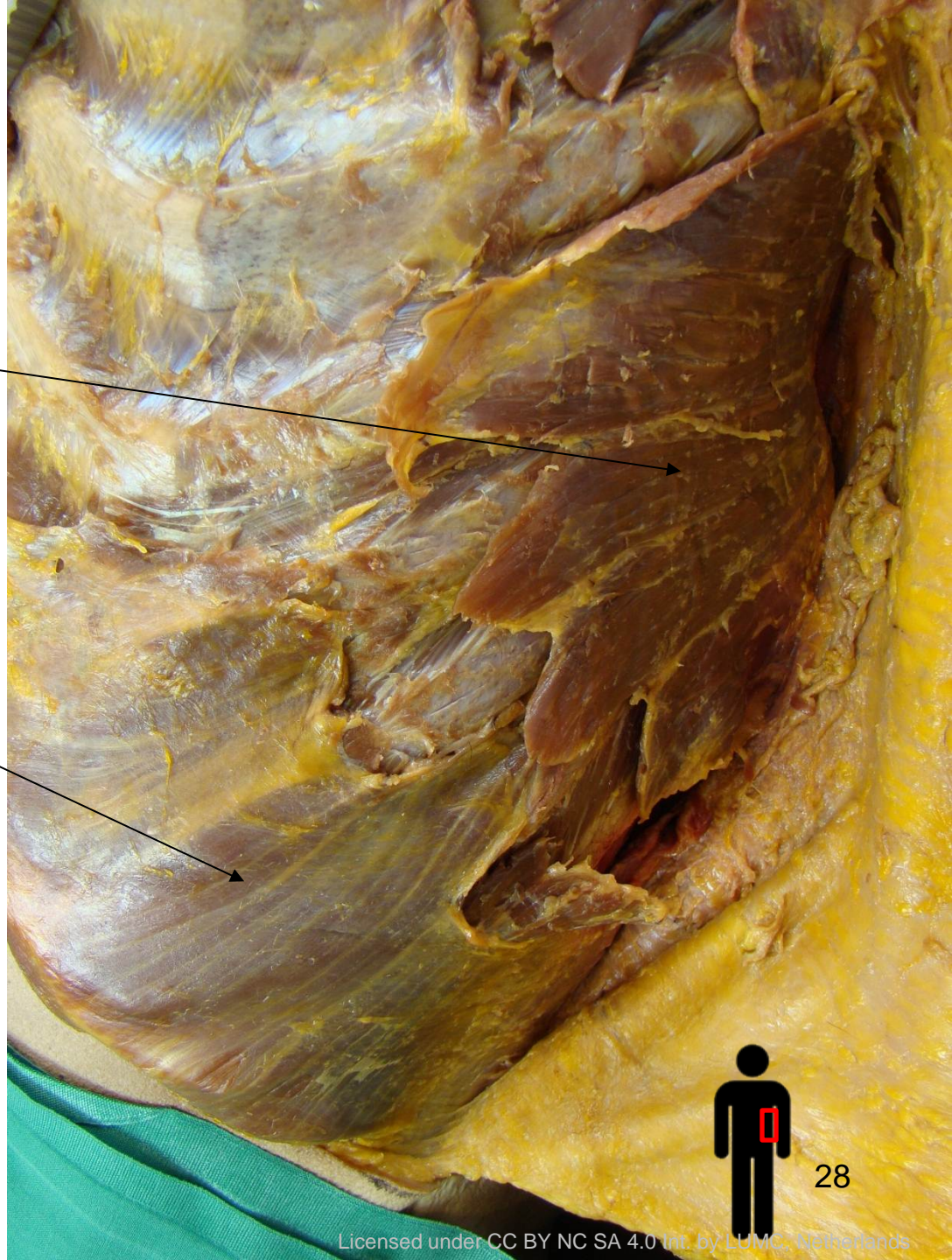
Serratus anterior muscle
interdigitation with

External abdominal
oblique muscle



Serratus anterior muscle
interdigitation with

External abdominal
oblique muscle



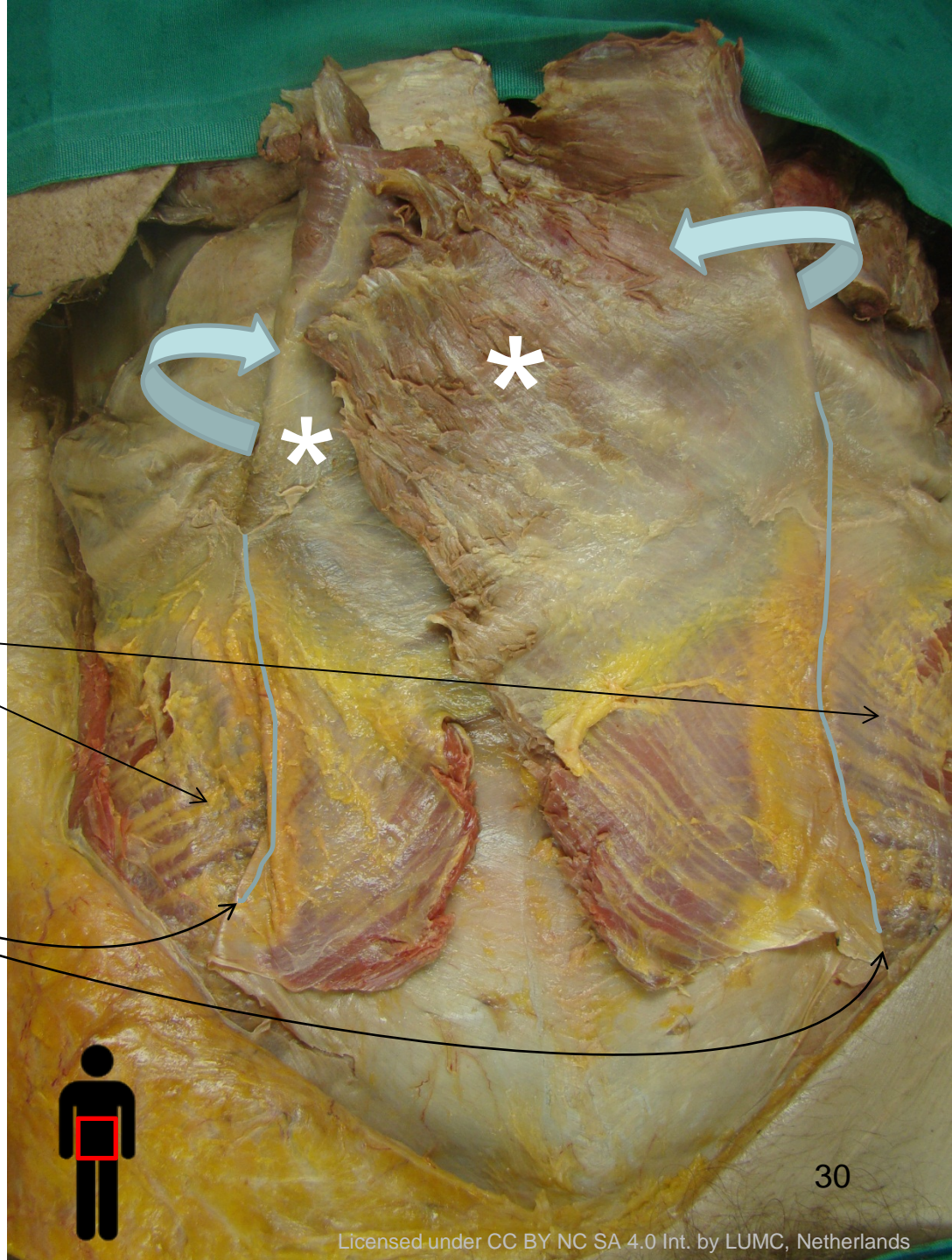
External abdominal
oblique muscle
origin detached from ribs



Both external abdominal oblique muscles* folded medially

Internal abdominal oblique muscle

Linea semilunaris
Spiegheli



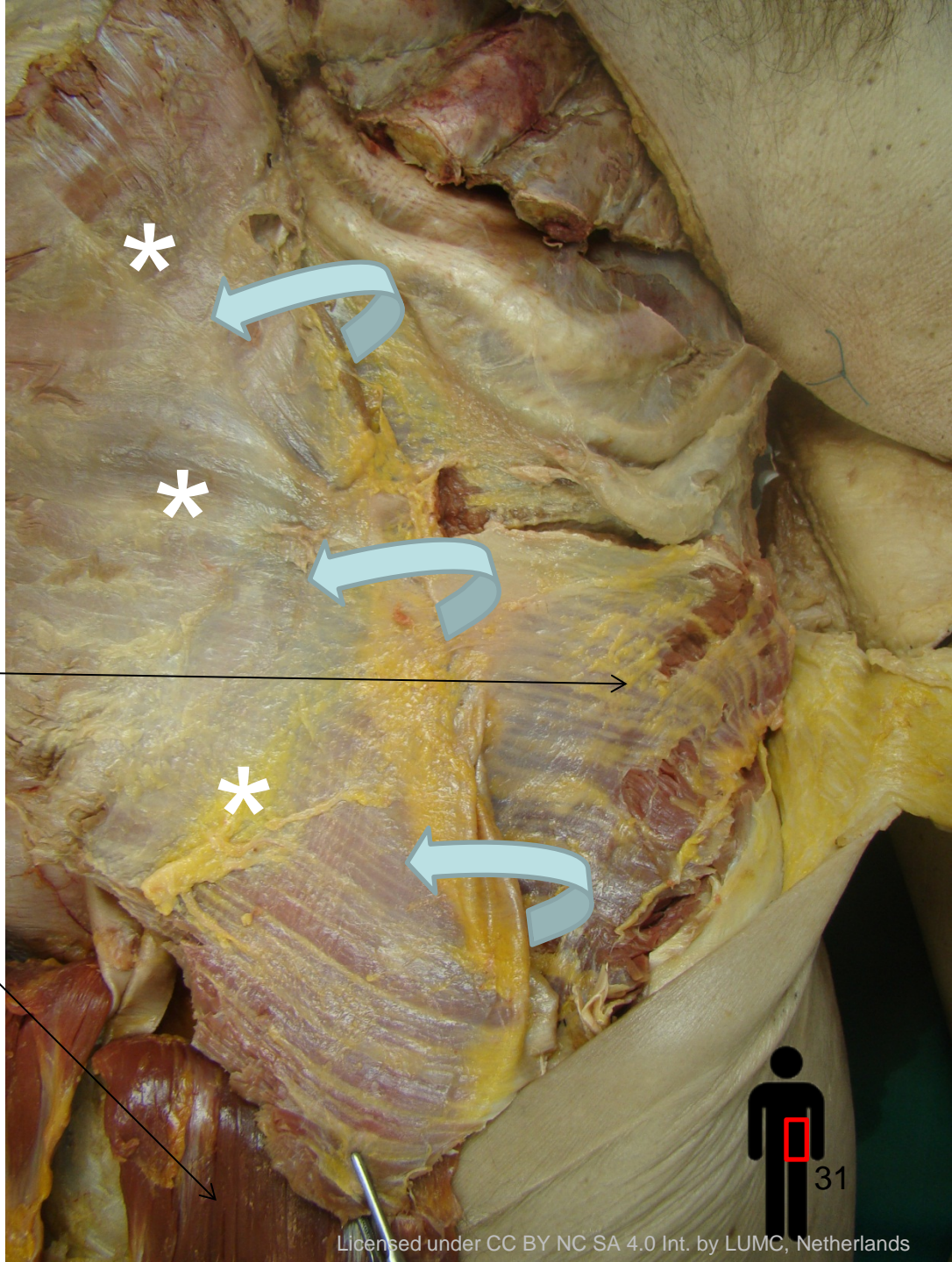
Closeup

External abdominal oblique muscle* folded medially

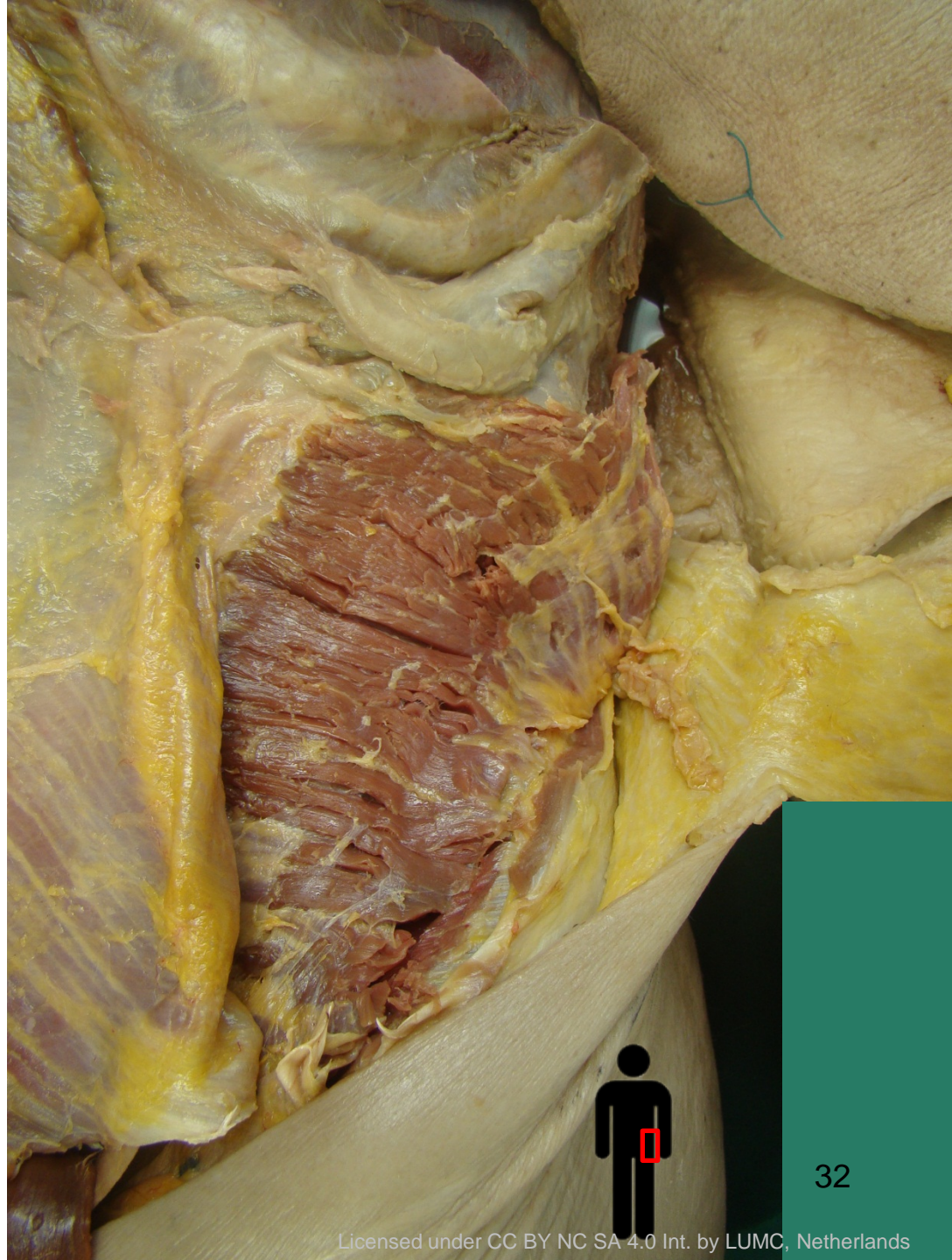
Internal oblique abdominal muscle

Rectus abdominis muscle folded caudally

View on left half of abdomen



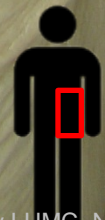
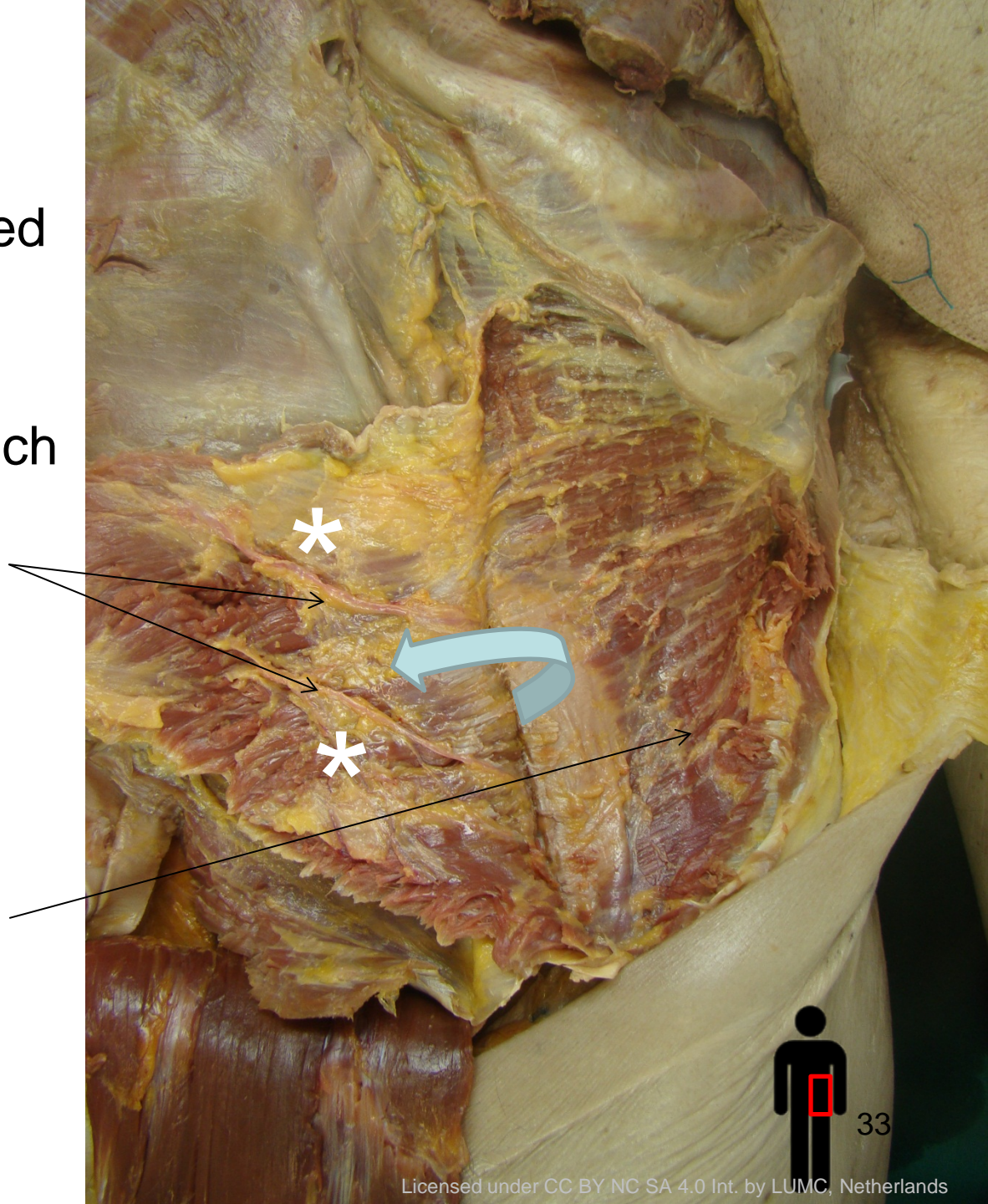
Internal abdominal
oblique muscle,
note fibre direction



Internal abdominal oblique muscle* is folded medially

Lateral cutaneous branch of thoracoabdominal (=intercostal) nerves innervate internal abdominal oblique muscle

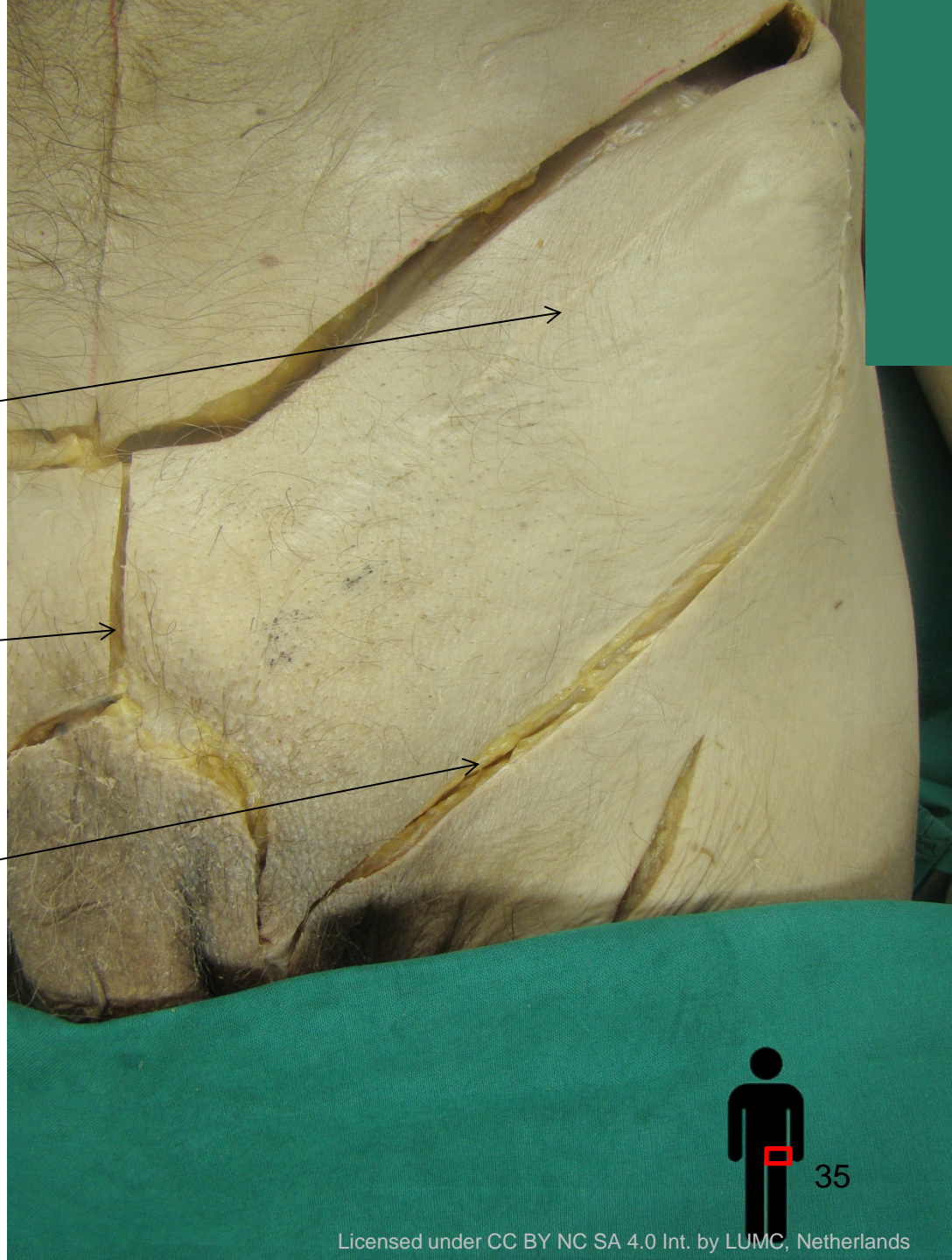
Transverse abdominal muscle



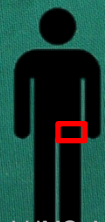
Inguinal area

Preparing inguinal region

- Scar of previous herniorrhaphy operation
- Mid line incision to mid scrotum
- Incision parallel and under inguinal ligament

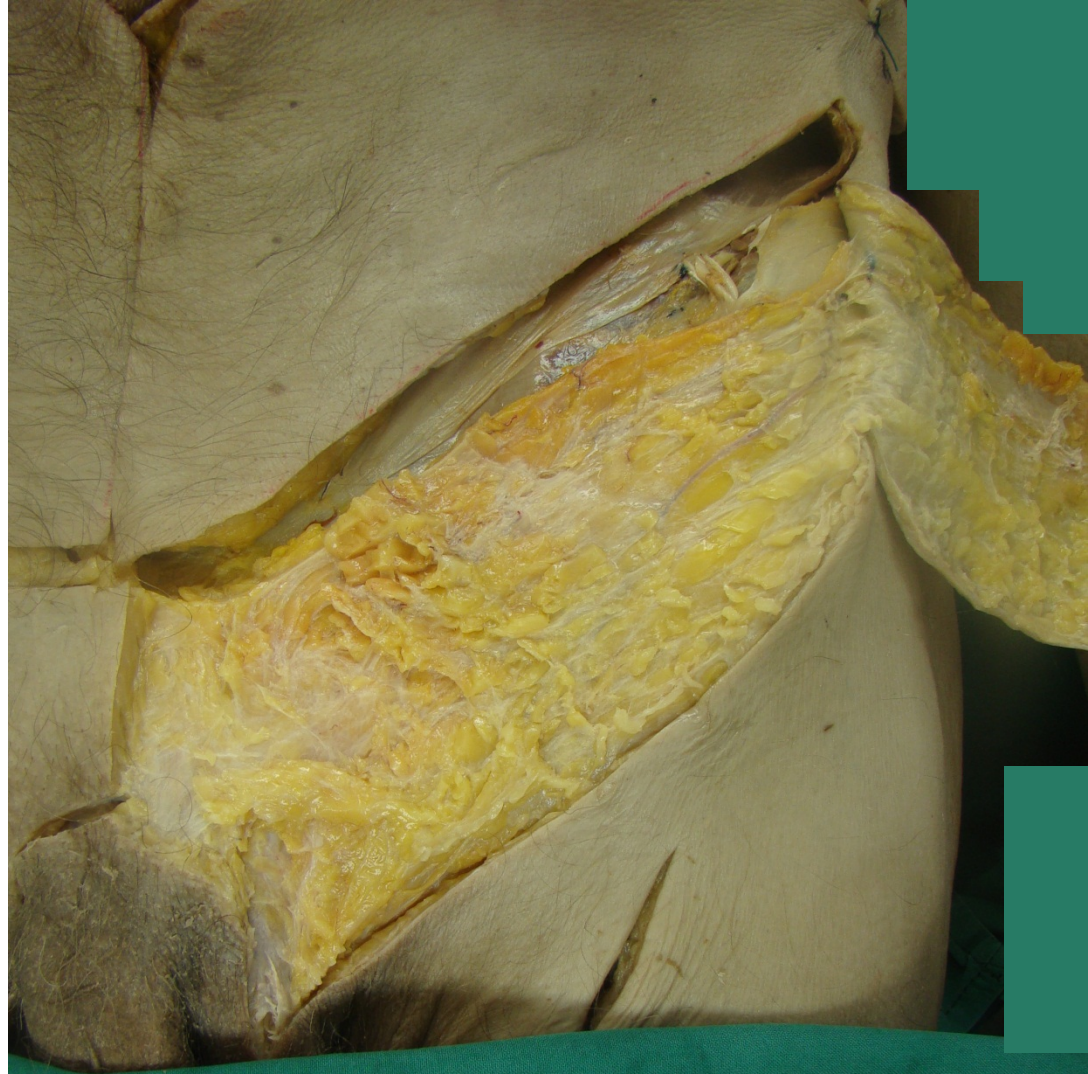


Left side

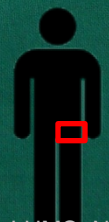


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Superficial fascia of inguinal region

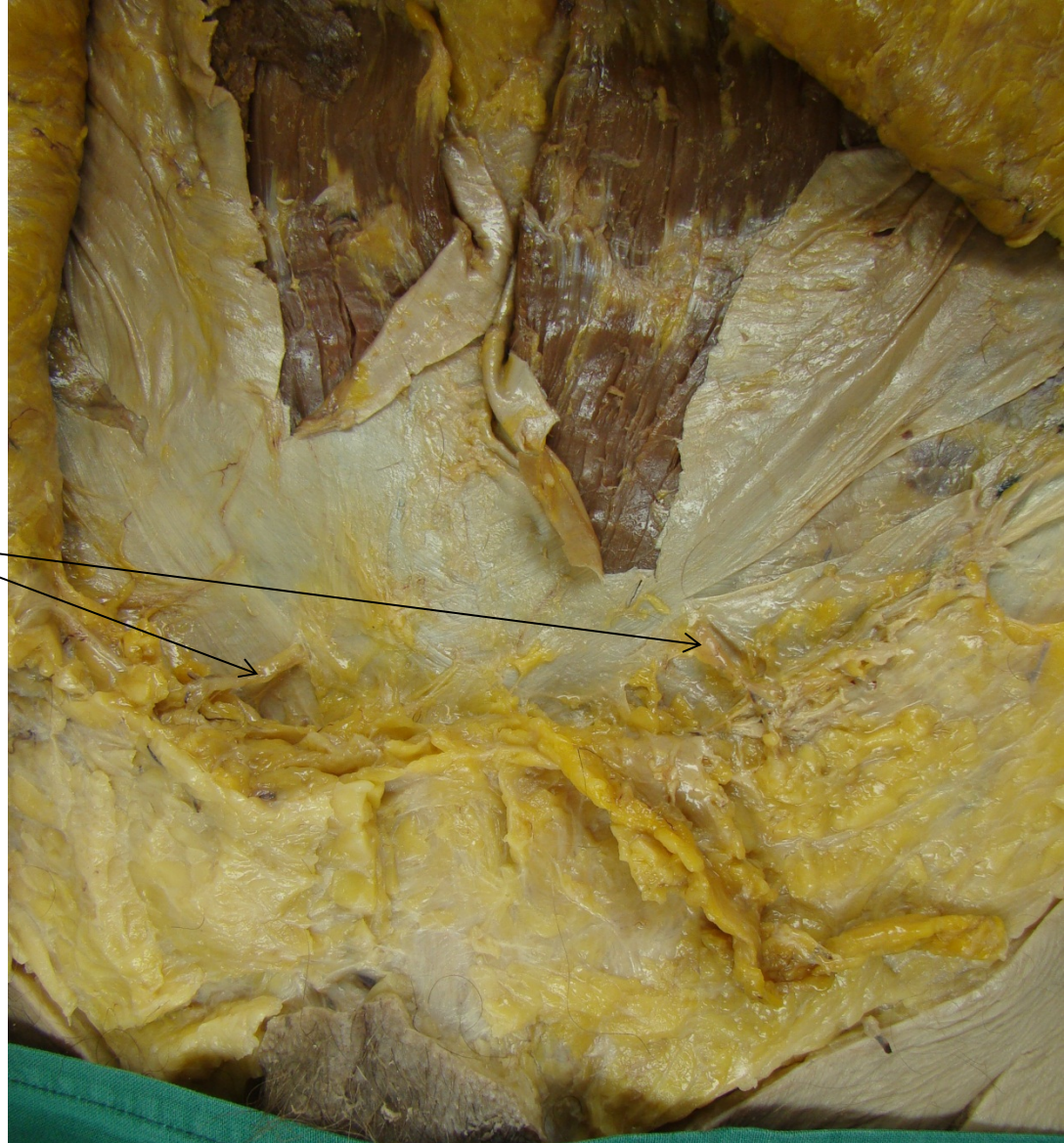


Left side

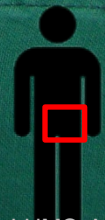


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Iliohypogastric nerve
emerging from external
oblique muscle
aponeurosis



Both sides

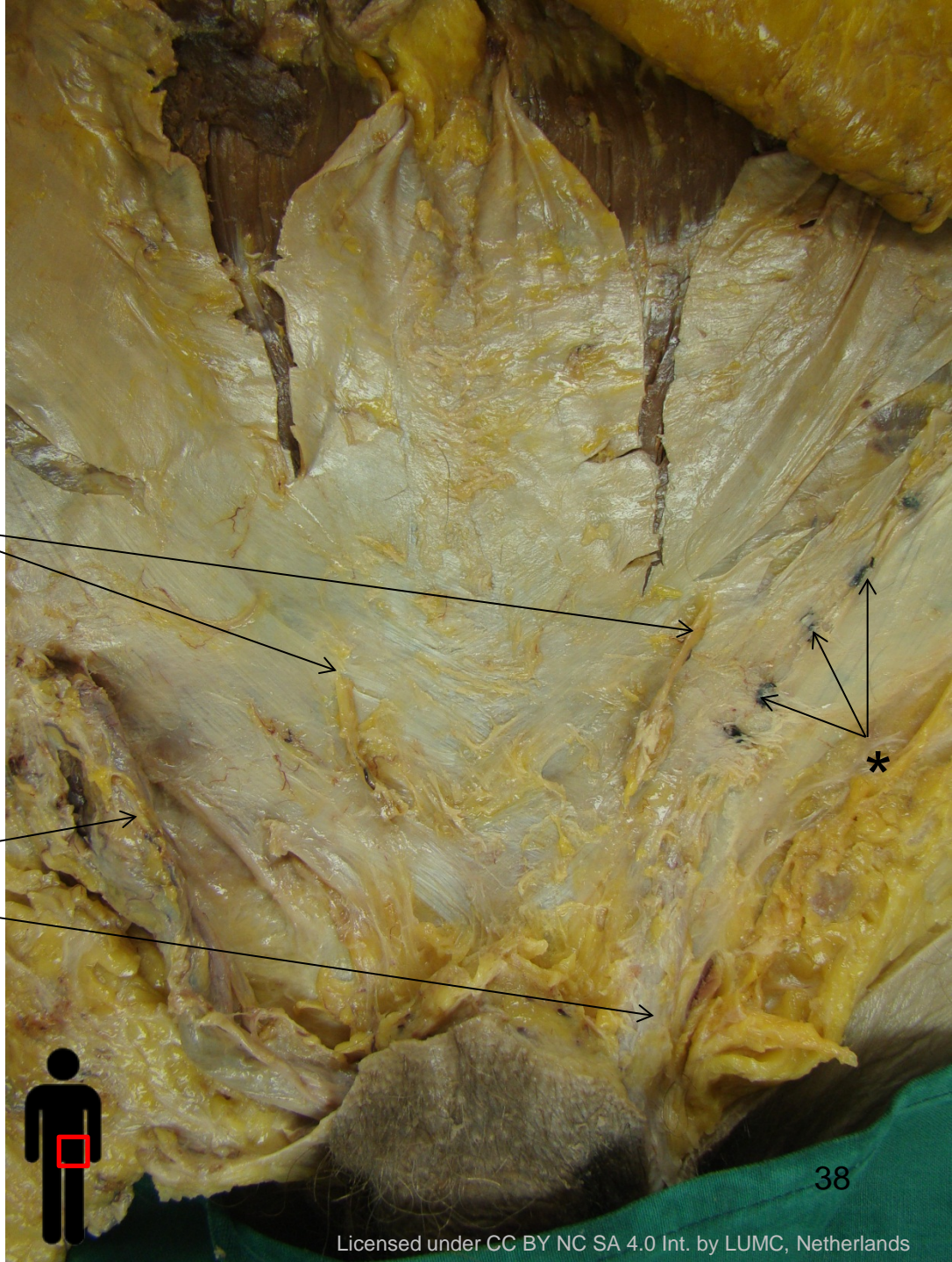


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Iliohypogastric nerves

Herniorrhaphy's stiches*

Spermatic cord



Both sides



Anterior wall of inguinal canal (aponeurosis of ext. obl. abd. muscle) cut (dashed line) and folded open

Oblique internal abdominal muscle

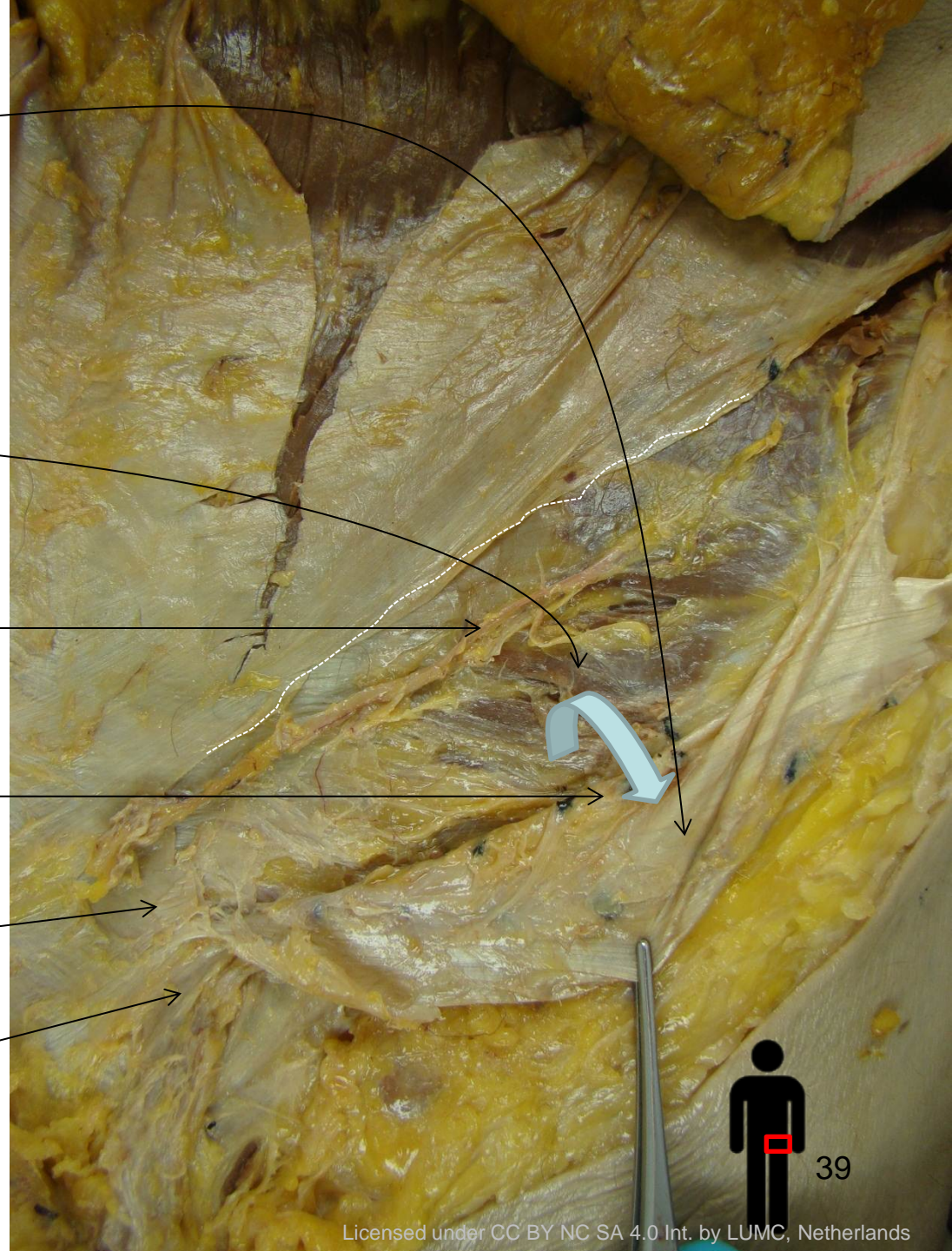
Iliohypogastric nerve

Inguinal ligament

Conjoint tendon

Spermatic cord

Left side



External inguinal ring

Spermatic cord

Note: this photo is from a different specimen

Left side



40

External oblique
abdominal muscle
aponeurosis

covering

Inguinal canal

External inguinal ring

Inguinal hernia

Spermatic cord

Note: this photo is from a
different specimen

Left side





Ilioinguinal nerve

Funiculus

Both sides



Spermatic cord and its contents

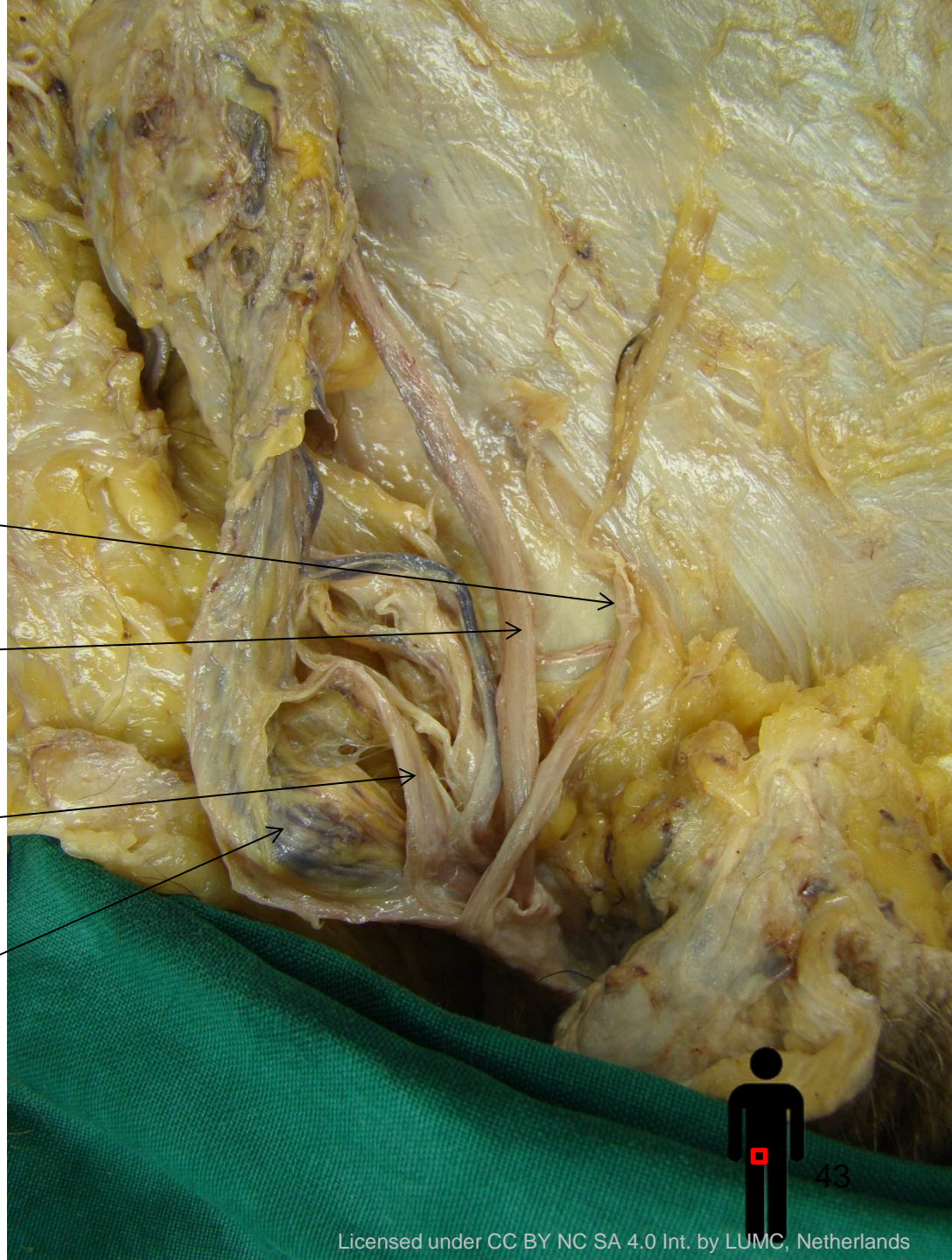
Ilioinguinal nerve

Ductus deferens

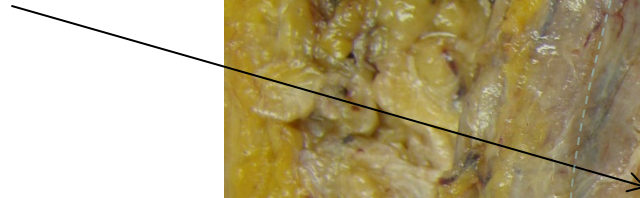
Genitofemoral nerve,
genital branch

Testicular vessel

Right side



Lateral (indirect) hernia
sac



Right side



Lateral (indirect) hernia sac



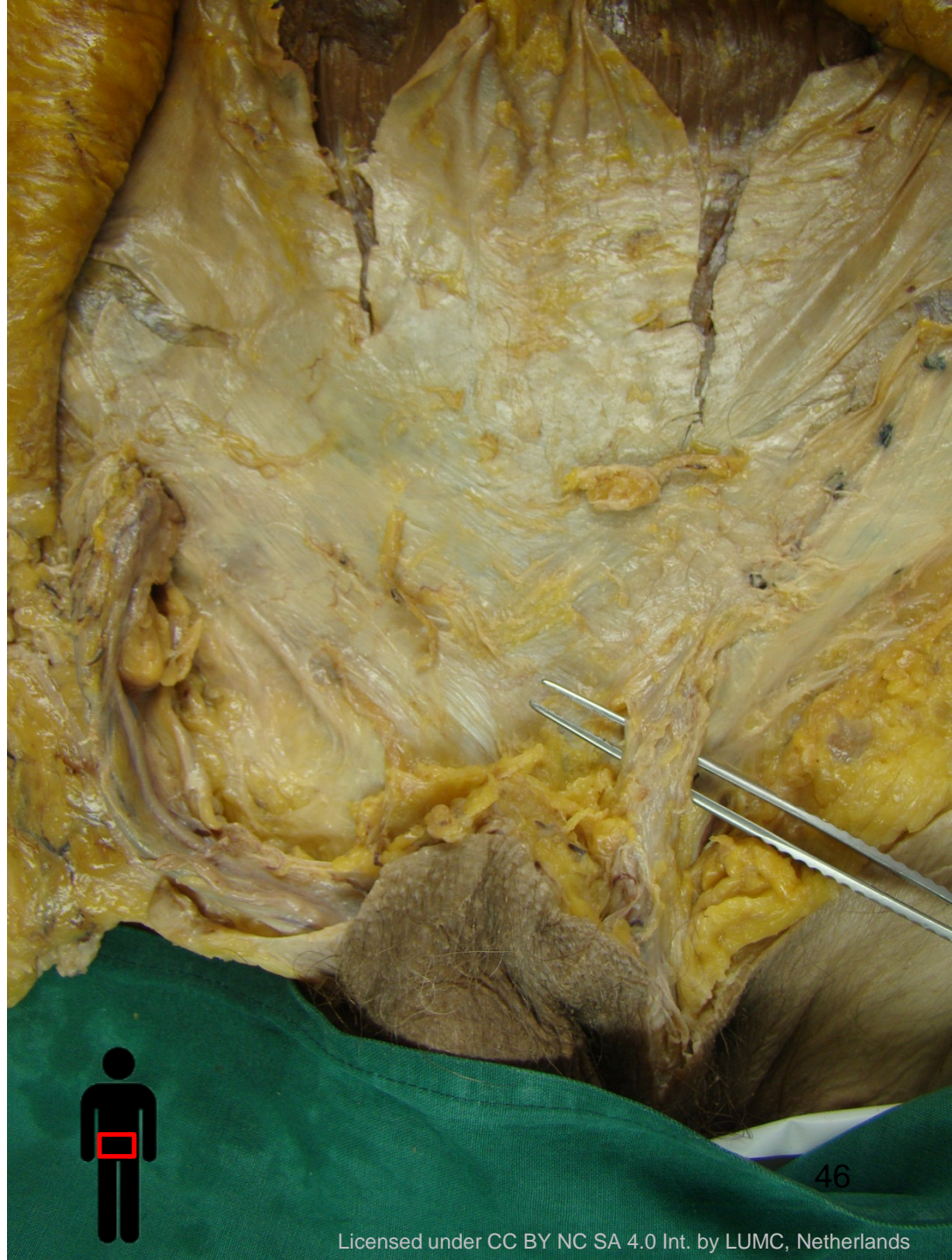
Right side

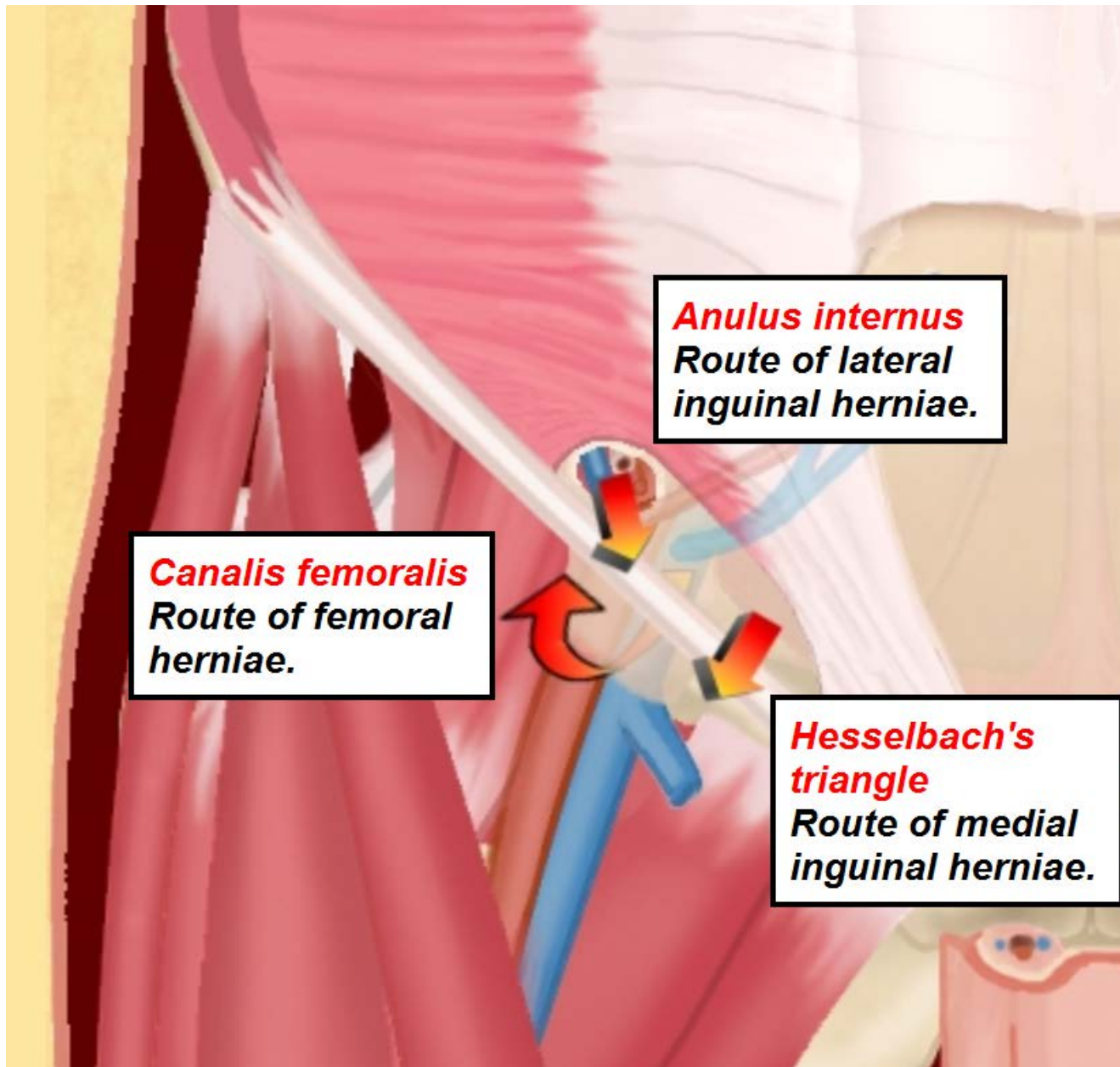


Right side lateral
(indirect) inguinal hernia

Left side hernia repaired

Both sides





Pre-peritoneum

Posterior rectus sheath *



Opened
Posterior rectus sheath

displaying
Parietal peritoneum

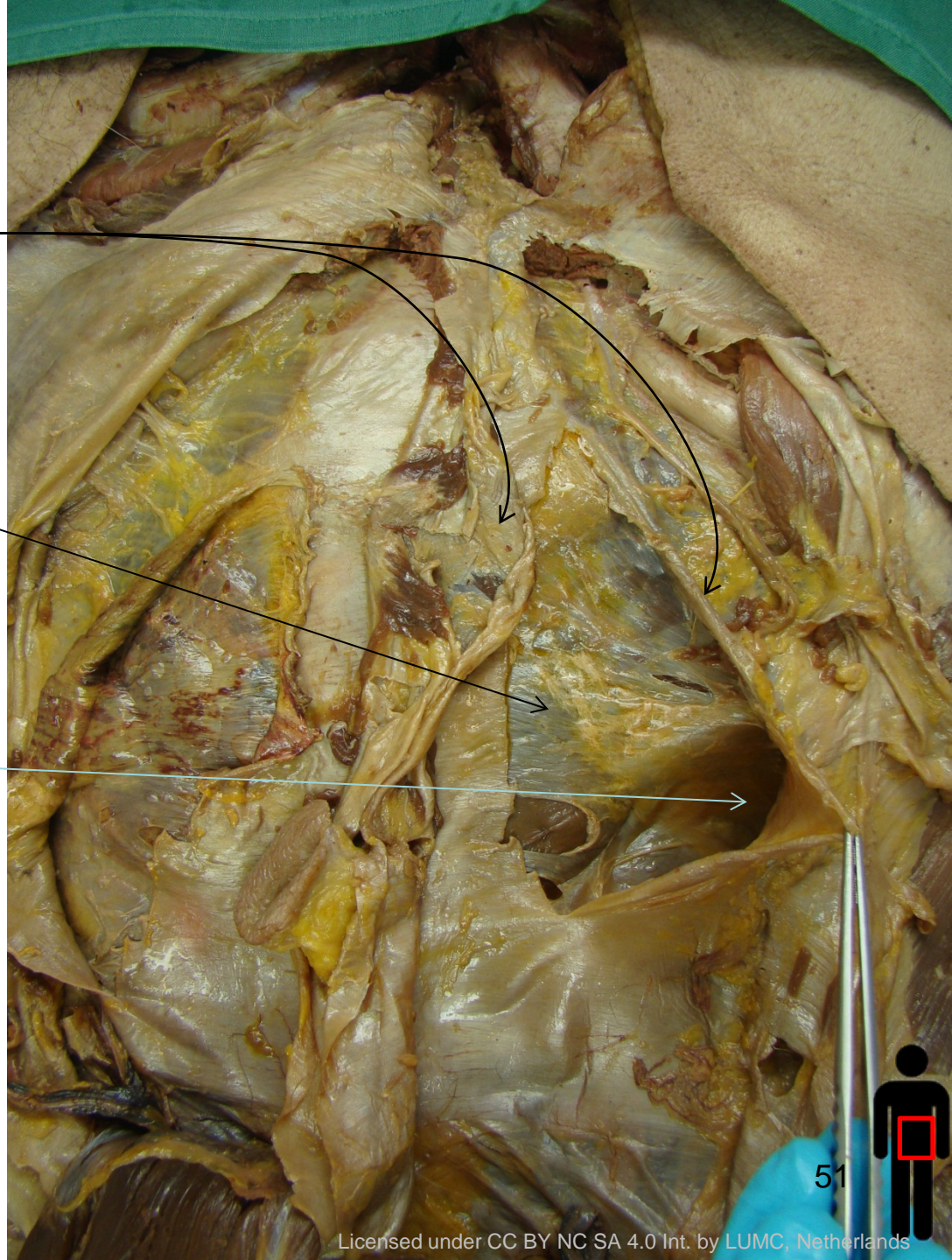
Umbilicus



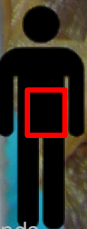
Opening lateralwards
between fascia layer
and
parietal peritoneum

exposes

Bogros' space
(lateral abdominal
extraperitoneal space)



Note: Opened on both sides, arrows
only on left side



Bogros' space
left

between

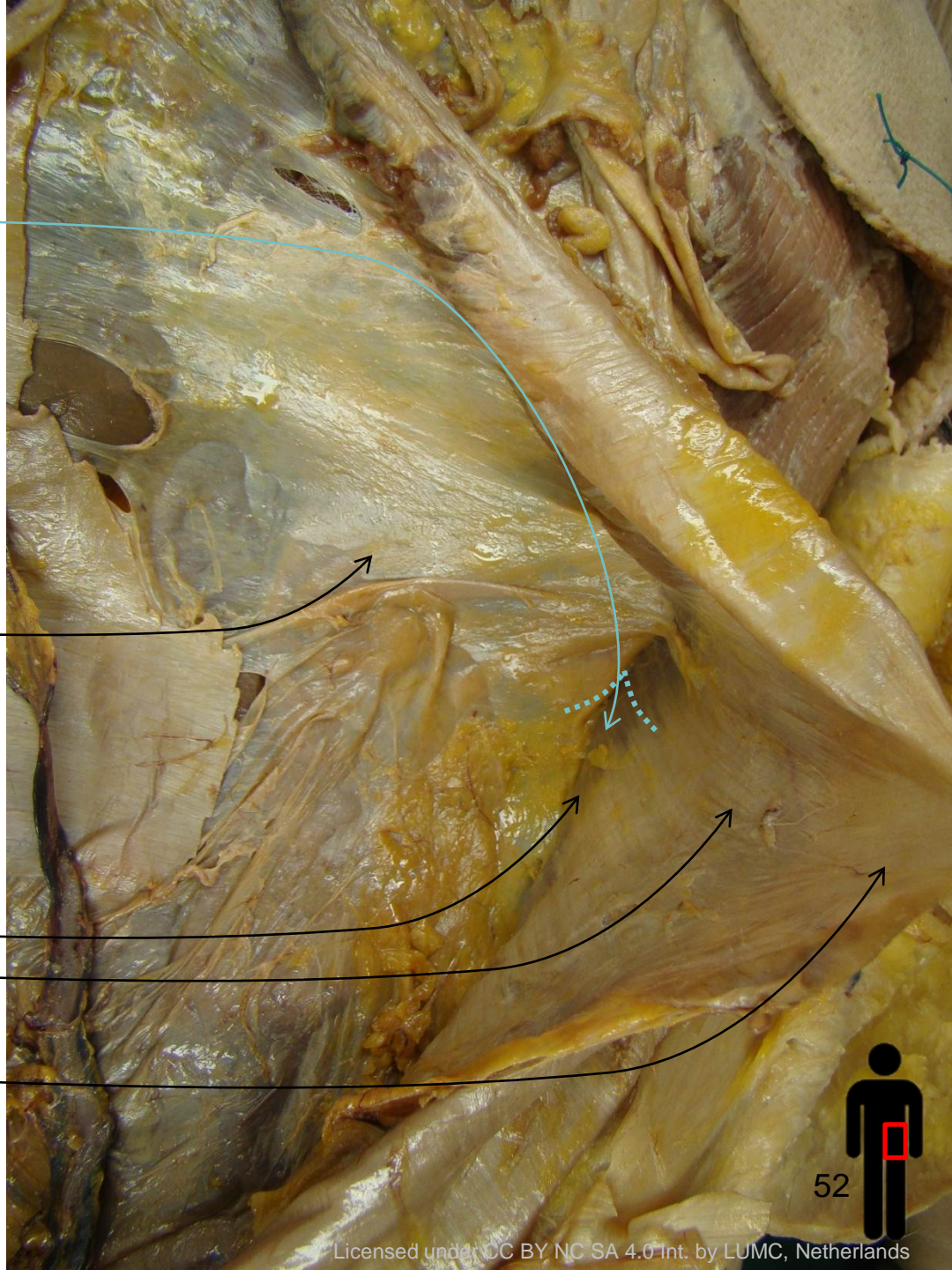
parietal peritoneum
and
fascia layer

consisting of:

transverse fascia (= the fascia internal to the
transverse abdominal muscle)

aponeurosis of transverse abdom. muscle
continuing to contribute to the

posterior sheath of rectus abdominis muscle



Bogros' space
right



Opening peritoneum and peritoneal ligaments of the abdominal wall

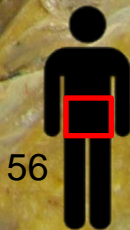
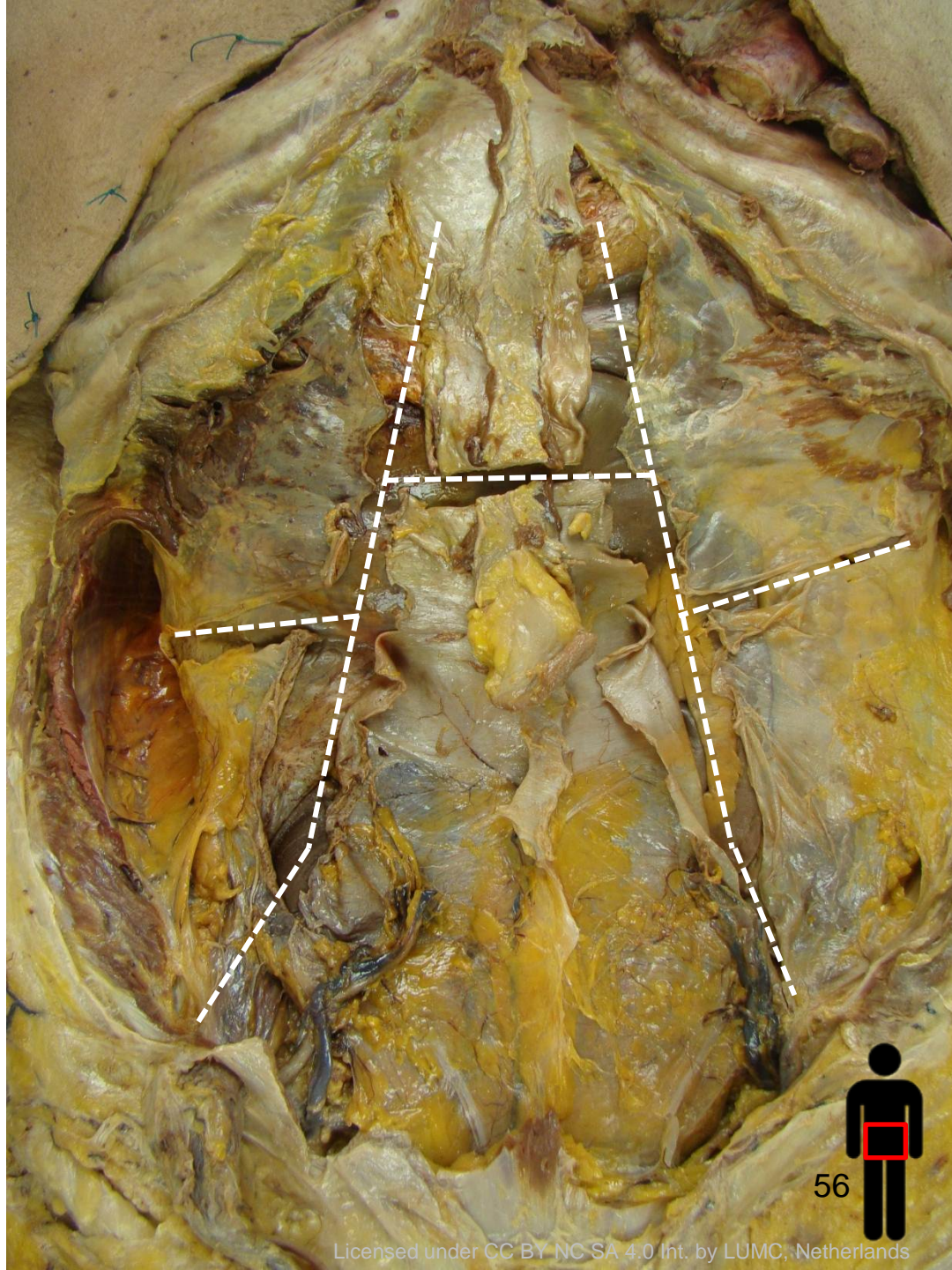
Opening of peritoneum

- Incisions lateral of median line
- Transverse incision above umbilicus
- Lateral incisions
- Inferolateral incisions toward inguinal ligament

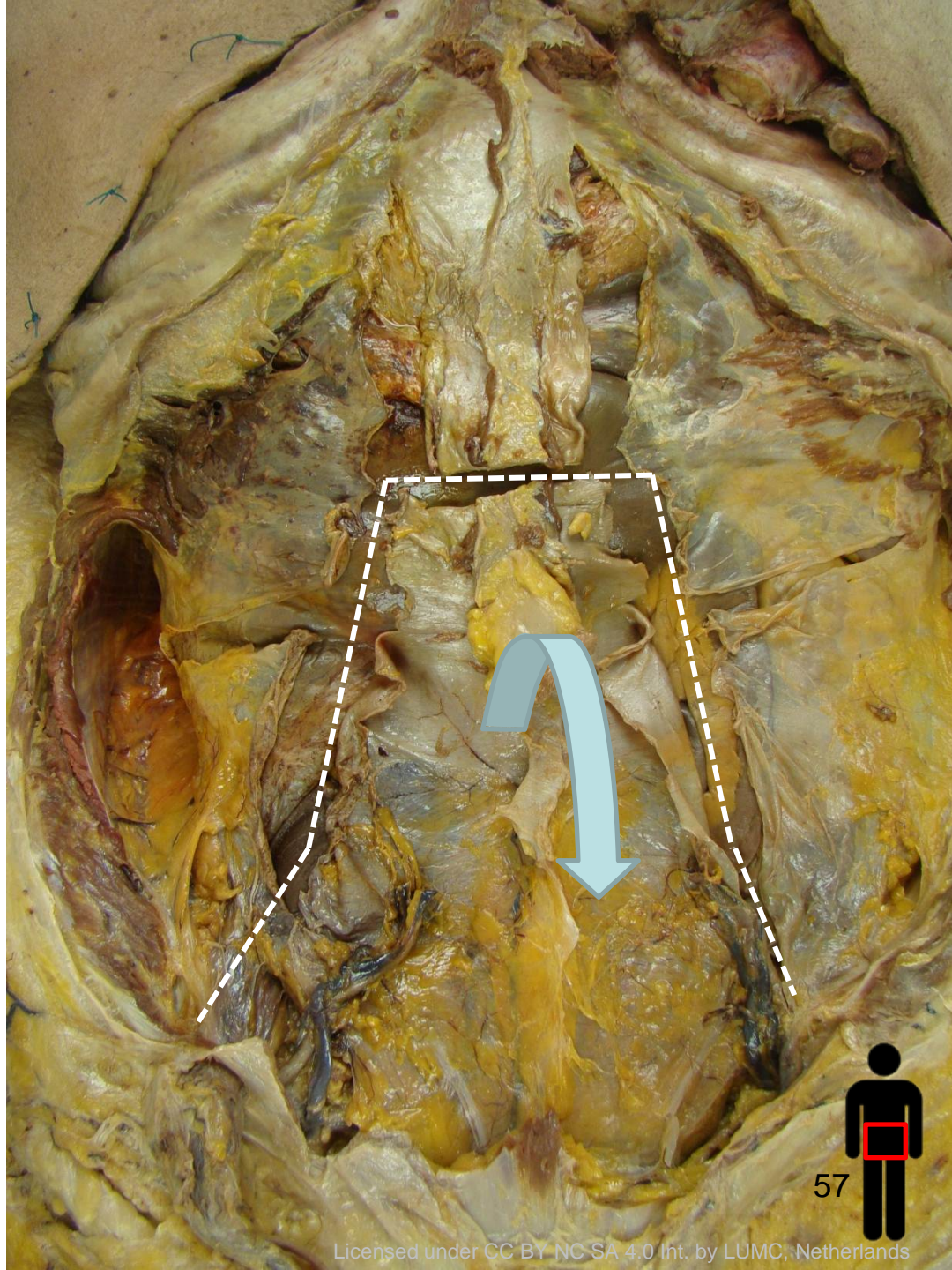


Opening of peritoneum

- Incisions lateral of median line
- Transverse incision above umbilicus
- Lateral incisions
- Inferolateral incisions toward inguinal ligament



Fold the part of the peritoneum below the navel caudally



Peritoneum inferior of navel folded caudally, view on interior side

Plicae umbilicales:

– Mediana

– Medialis

– Lateralis

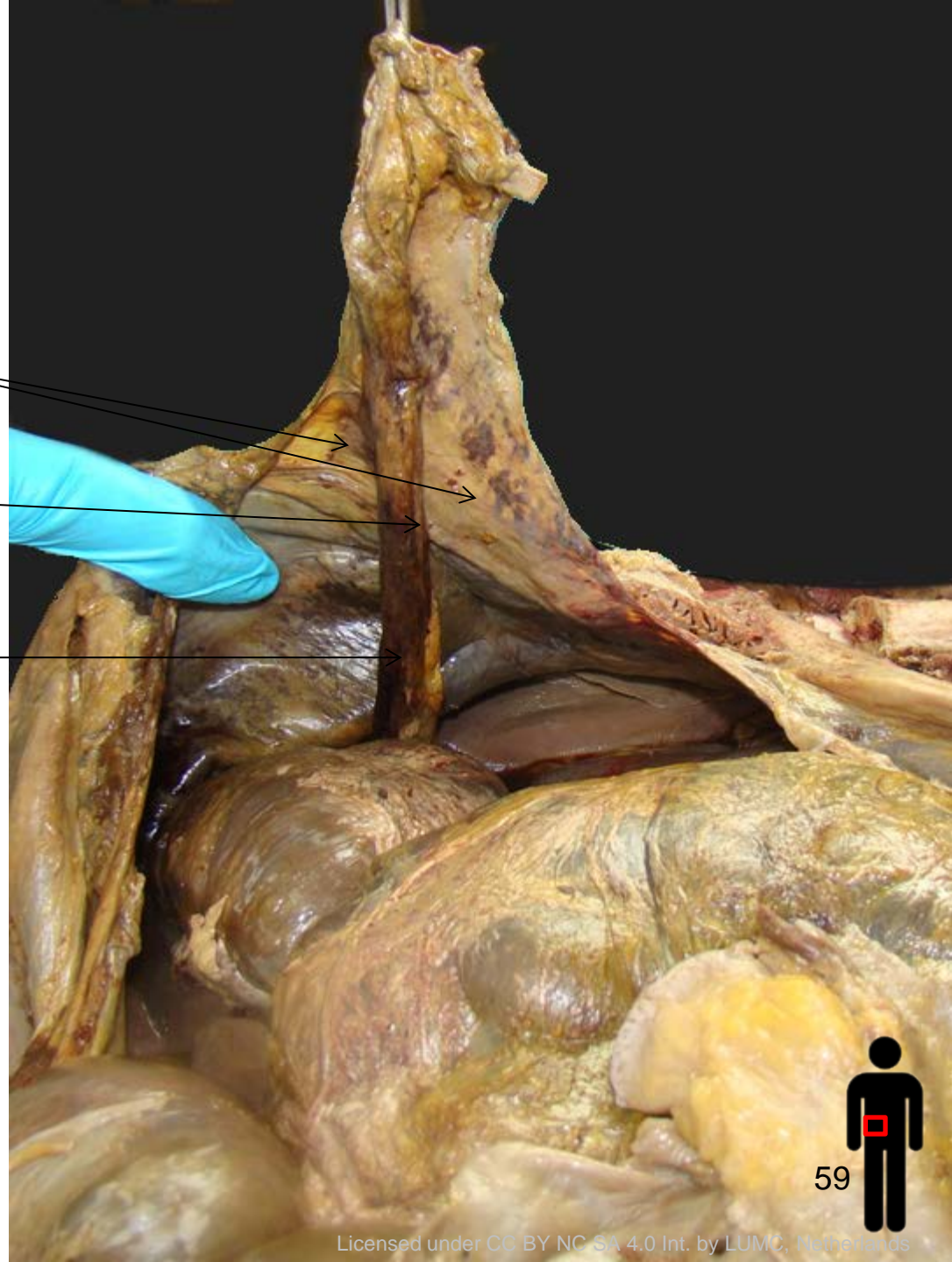


Parietal peritoneum

Falciform ligament
(only small ridge visible)

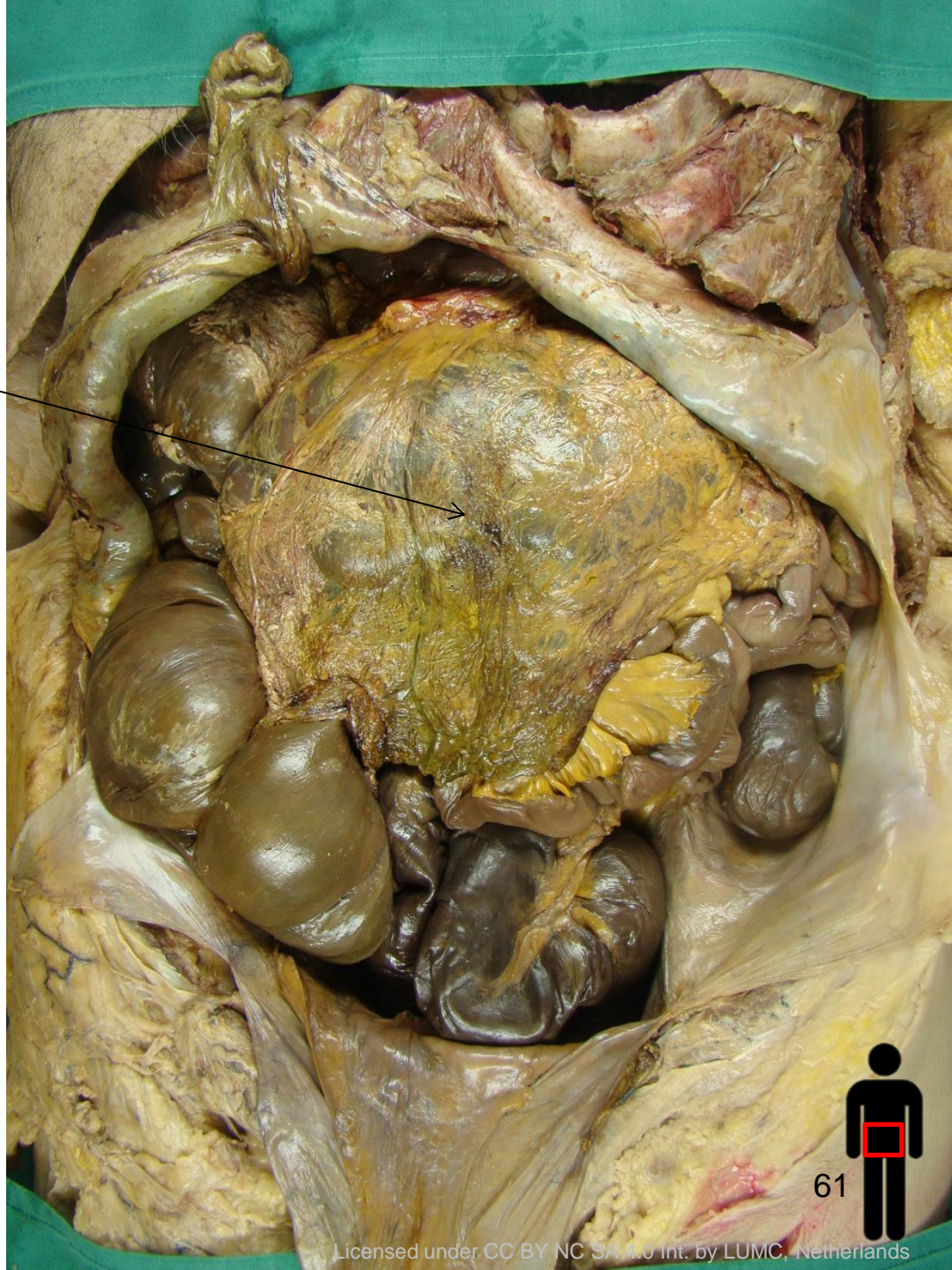
Ligamentum teres
hepatis

(View from the feet)



Inside the peritoneal cavity, Intestines

Greater omentum



Greater omentum and transverse colon folded cranially

Greater omentum
transverse colon

Duodenojejunal flexure
(Treitz)

Jejunum

Mesentery

Ileocaecal junction

Ileum

Appendix



Jejunum and ileum
folded towards the left

Duodenojejunal flexure

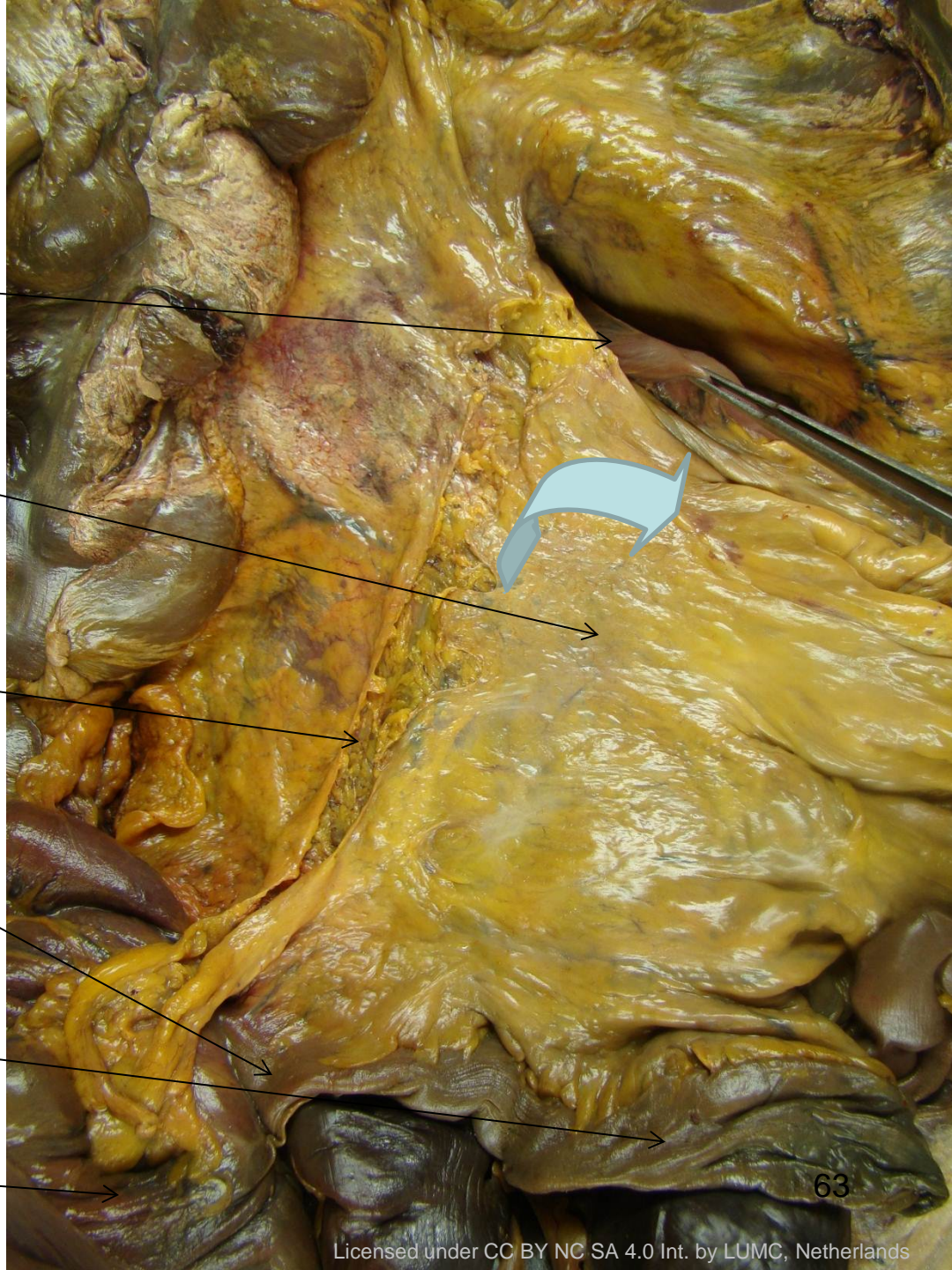
Mesentery

Cut indicating location of
Radix mesenterii

Ileocaecal junction

Ileum

Caecum

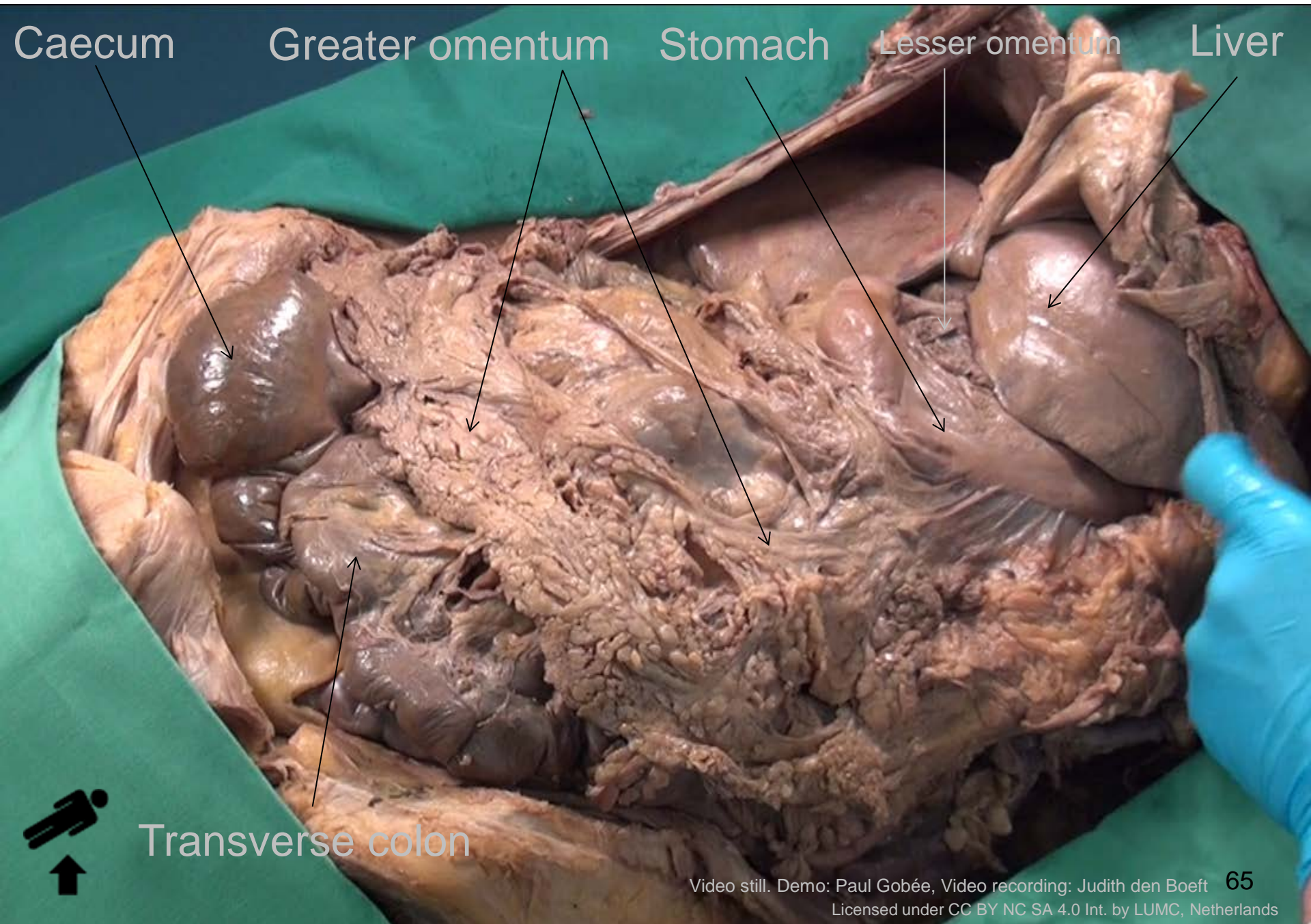


Peritoneum

(mesocolon, mesentery, omenta)

Some views from another specimen, highlighting the peritoneum.

Overview



Caecum

Greater omentum

Stomach

Lesser omentum

Liver

Transverse colon



Greater omentum detached from transverse mesocolon and folded cranialward, allowing view in omental bursa

Transverse mesocolon
Transverse colon

Omental bursa
Greater omentum
Stomach



Dotted lines indicate areas that were originally attached

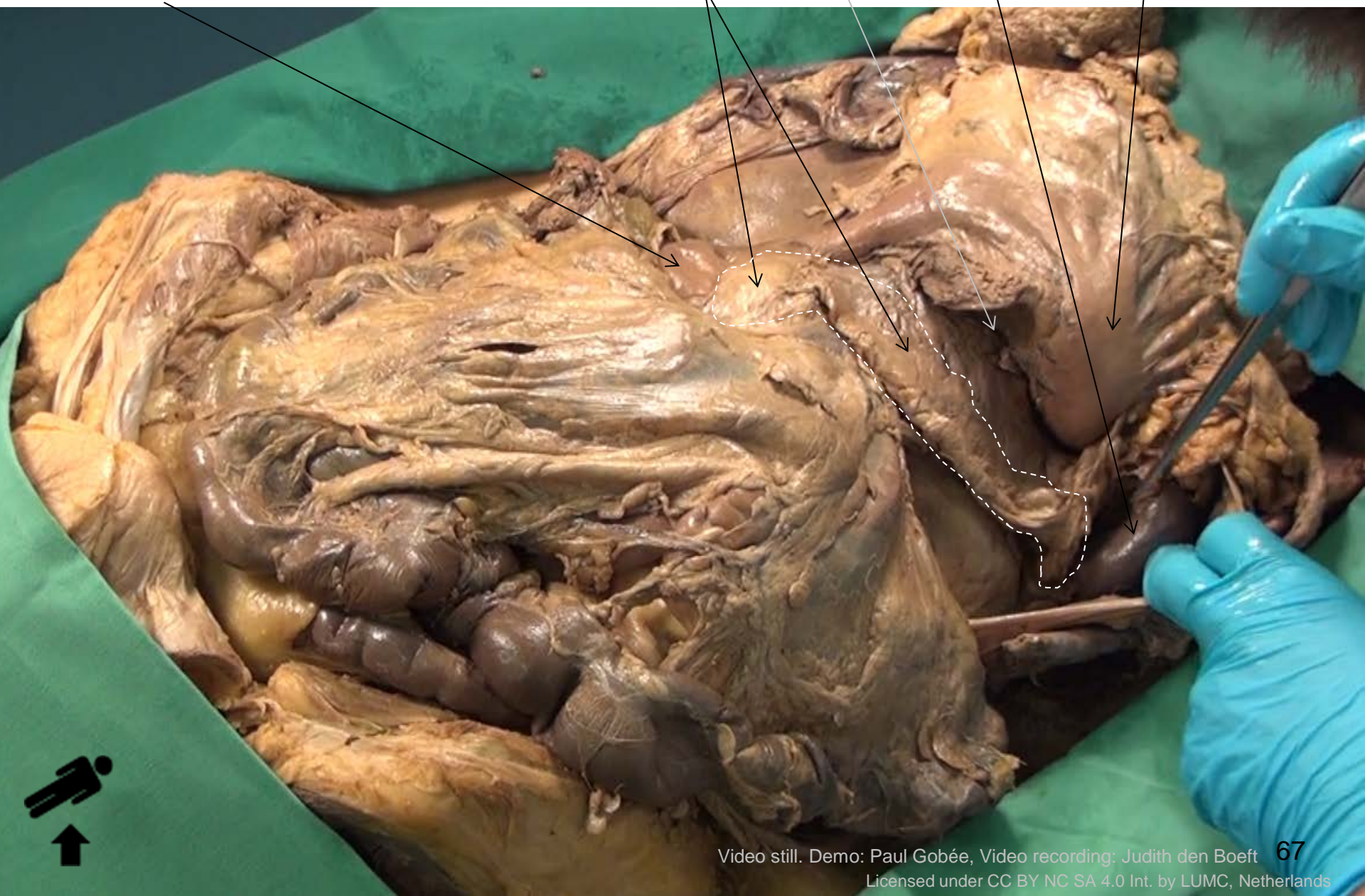
View into Omental bursa

Duodenum

Pancreas (dotted outline)

Spleen

Stomach

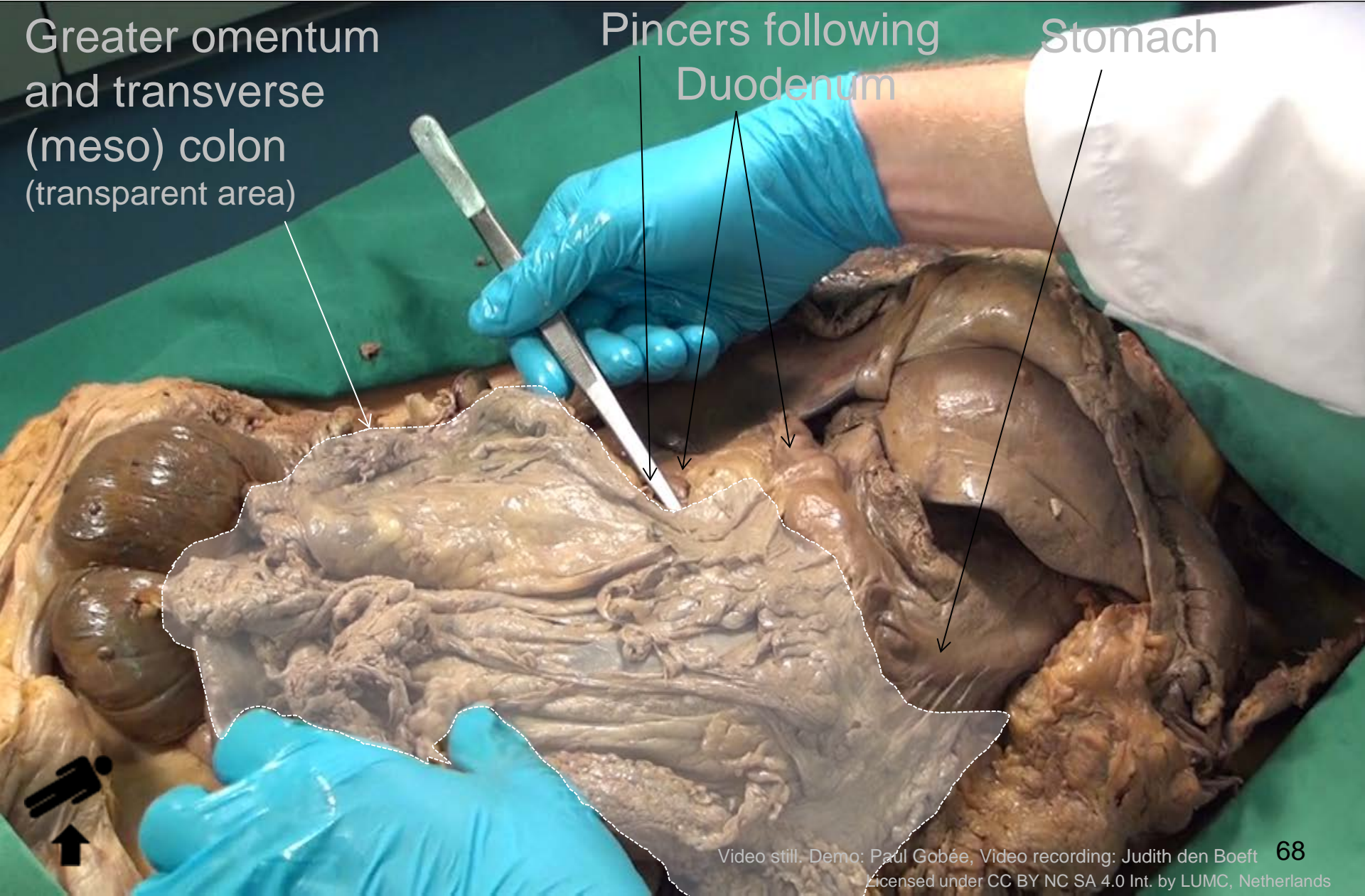


Pincers following duodenum, where it crosses dorsal of trv. colon (see pincers reappear 2 slides further)

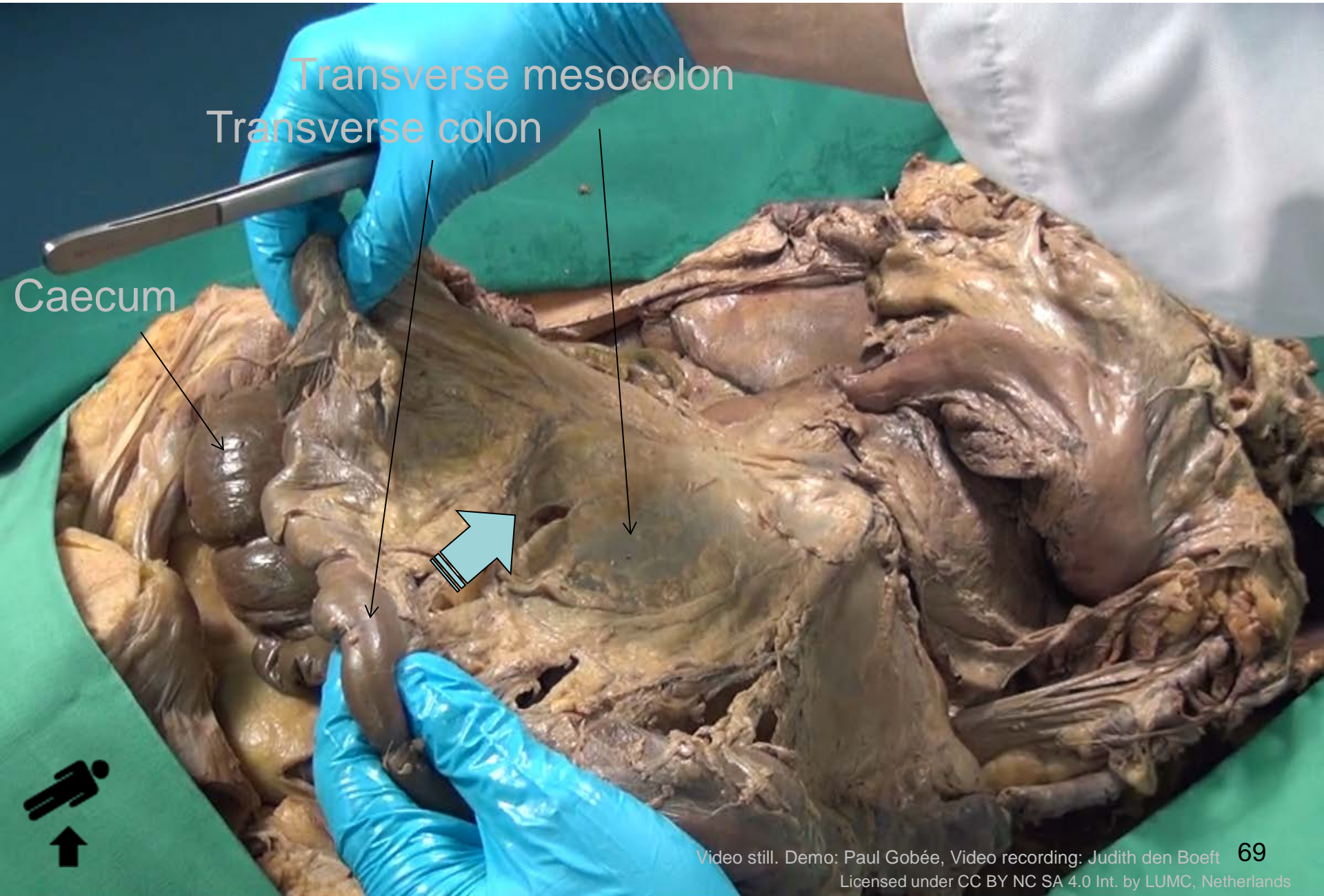
Greater omentum
and transverse
(meso) colon
(transparent area)

Pincers following
Duodenum

Stomach



Folding the transverse colon and its mesocolon cranialward (greater omentum was already detached from transverse mesocolon and folded cranialward)



Transverse colon and its mesocolon folded cranialward,
allowing view on small intestines



Pincers reappearing at Treitz' point *

Small intestines

Duodenum

Jejunum

Transverse mesocolon

Transverse colon



Treitz' point *:

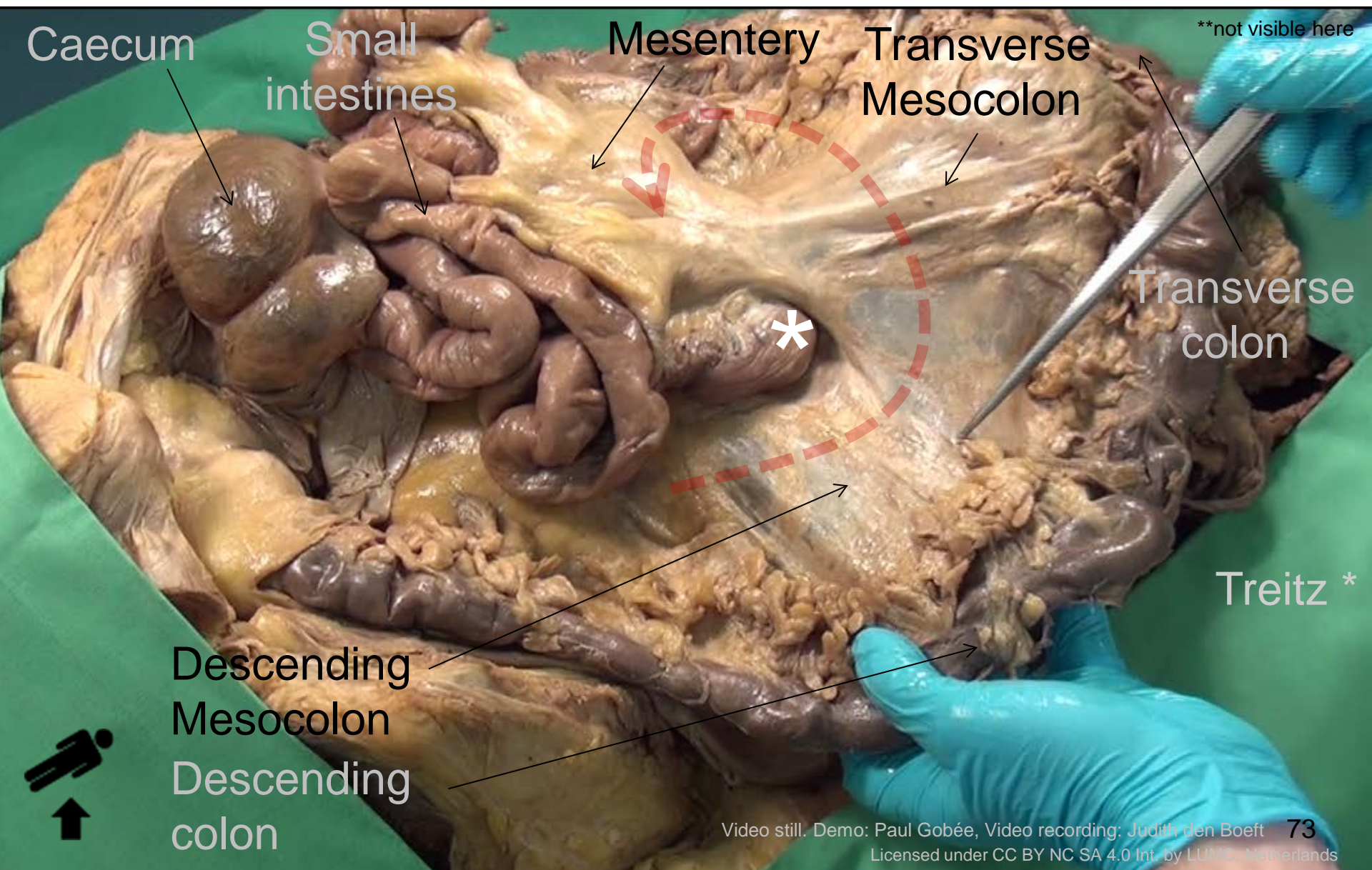
where (secondary retroperitoneal) duodenum becomes (intraperitoneal) jejunum

Small intestines
folded to the right



Showing continuity of descending, transverse, (ascending)** mesocolon and mesentery

(transparent red curved line indicates intestinal rotation during embryonal period)

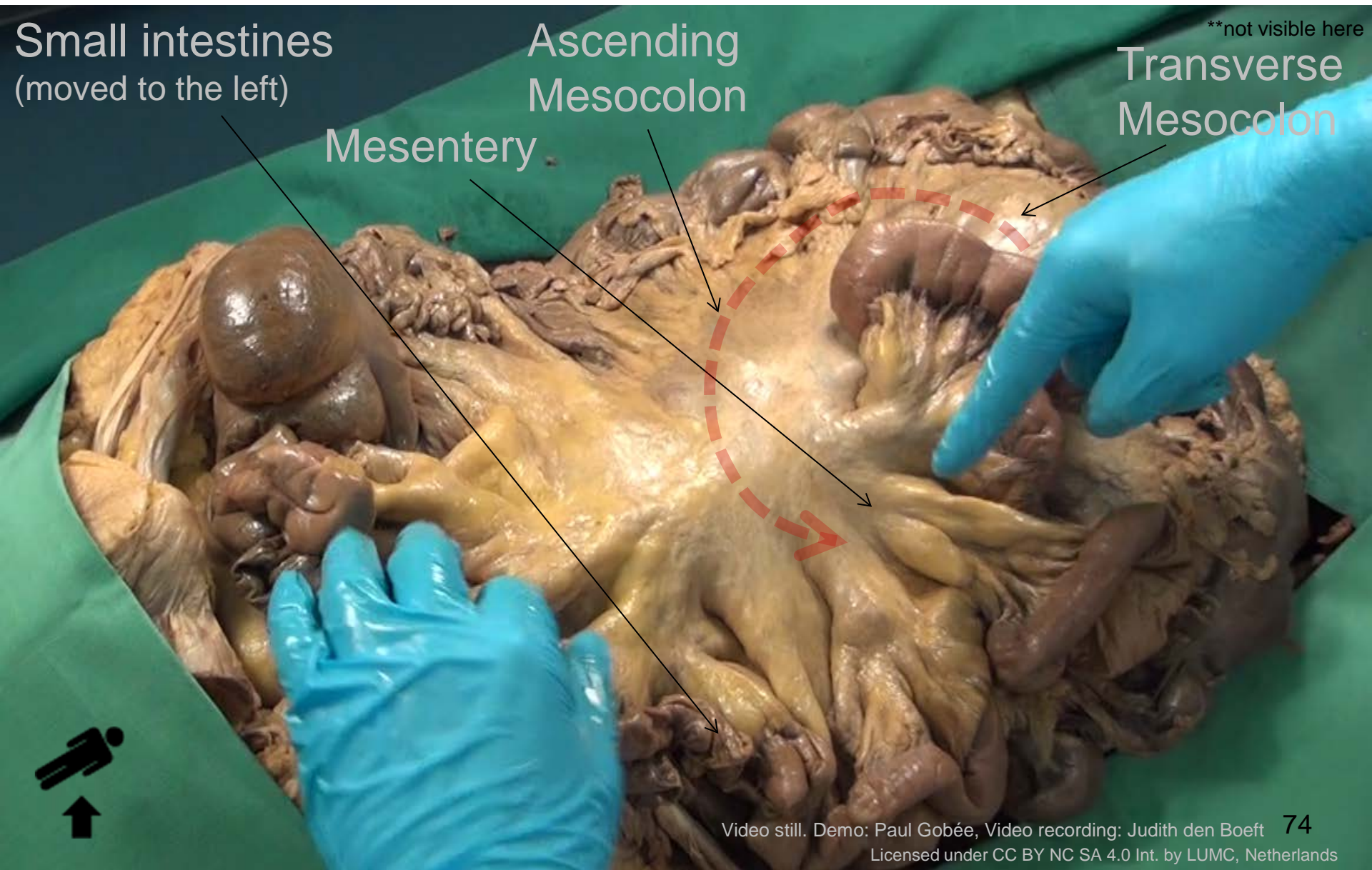


**not visible here

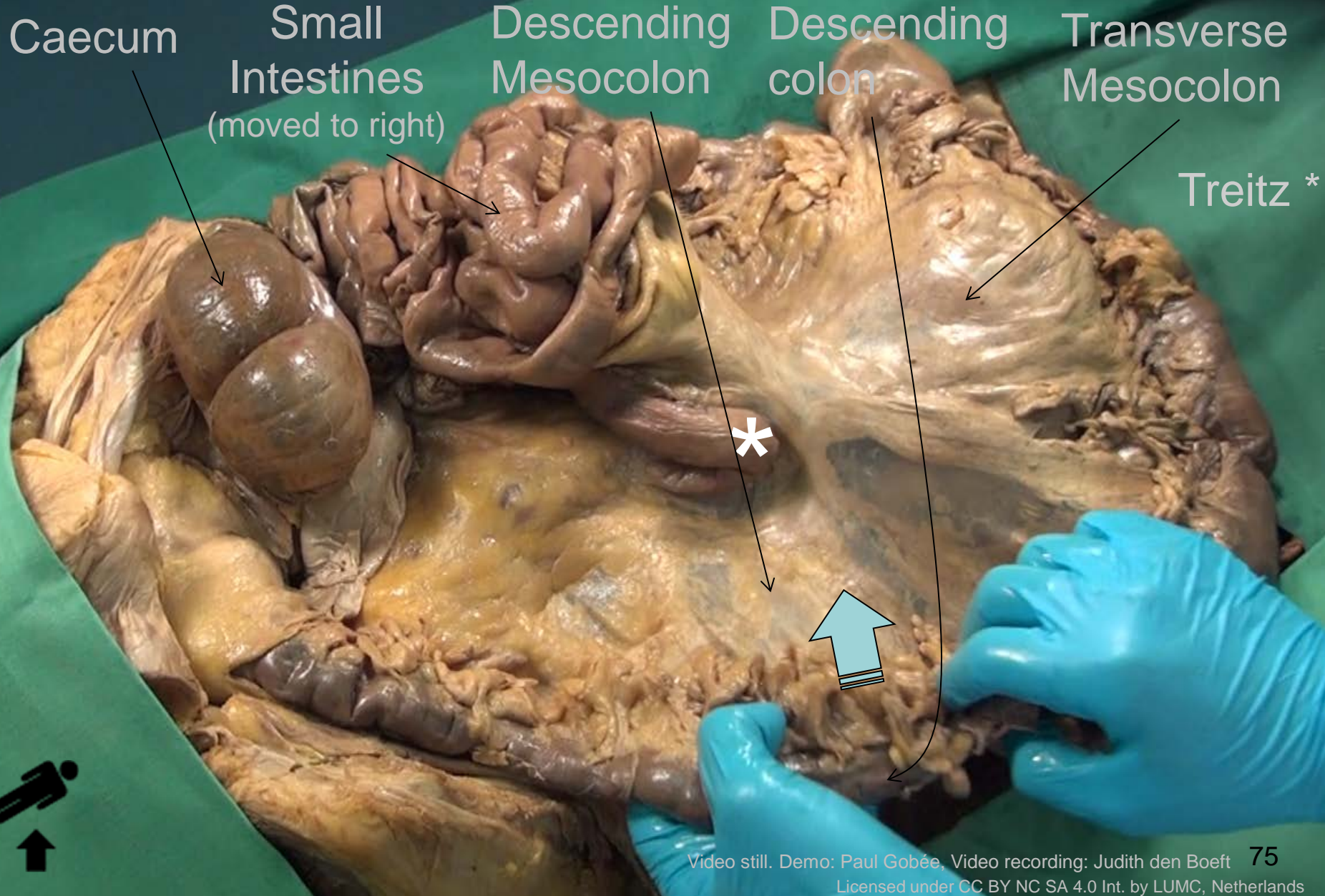


Showing continuity of (descending)** , transverse, ascending mesocolon and mesentery

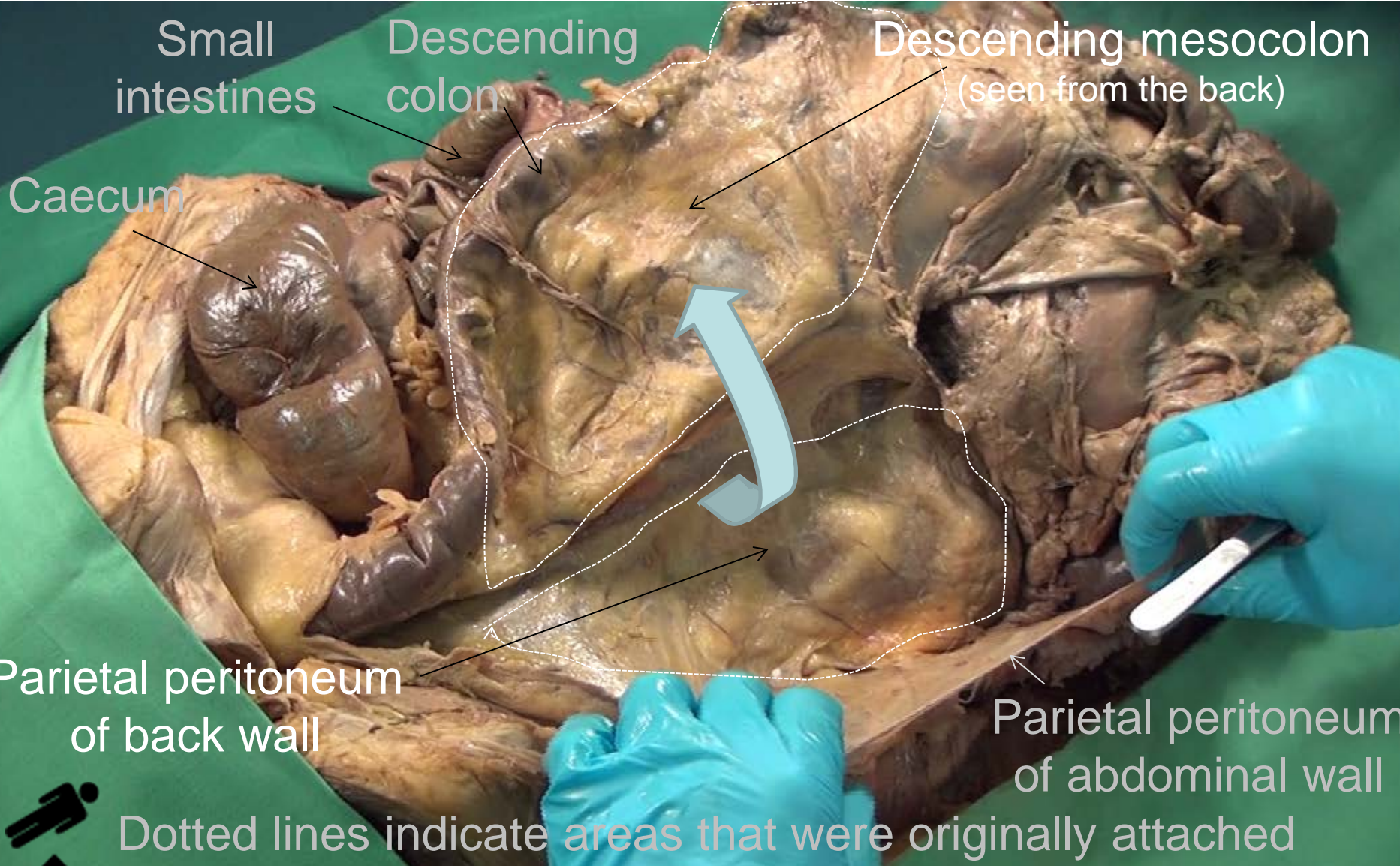
(transparent red curved line indicates intestinal rotation during embryonal period)



Descending (meso)colon can be detached from parietal peritoneum on back wall



Descending (meso)colon detached from parietal peritoneum of back wall and folded to right



Ascending (meso)colon can also be detached and lifted from parietal peritoneum of back wall

Ascending colon

Ascending mesocolon

Caecum

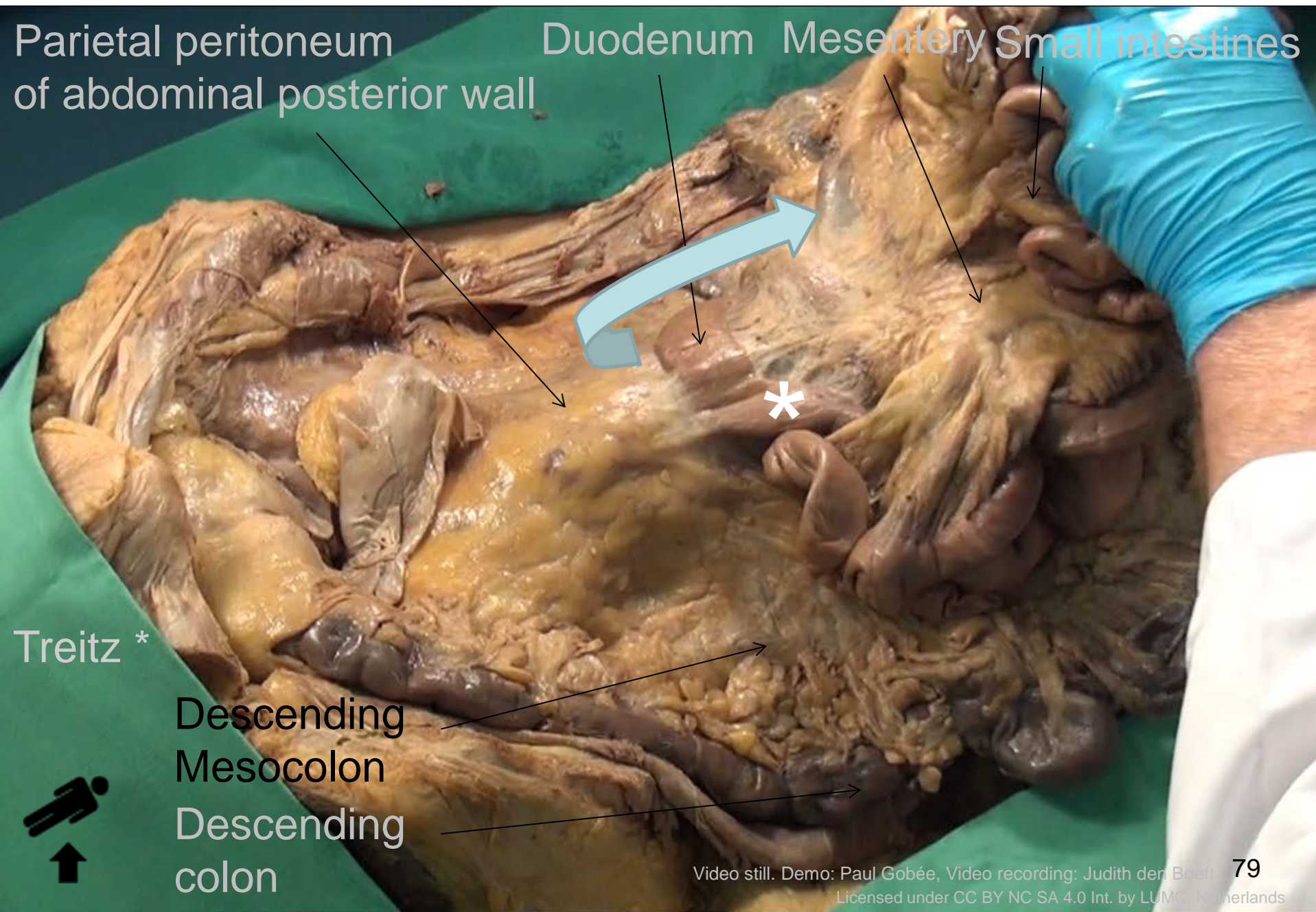
Small intestines



This allows to mobilise ascending colon and small intestines together and move them cranialward



Ascending colon and small intestines folded cranialward

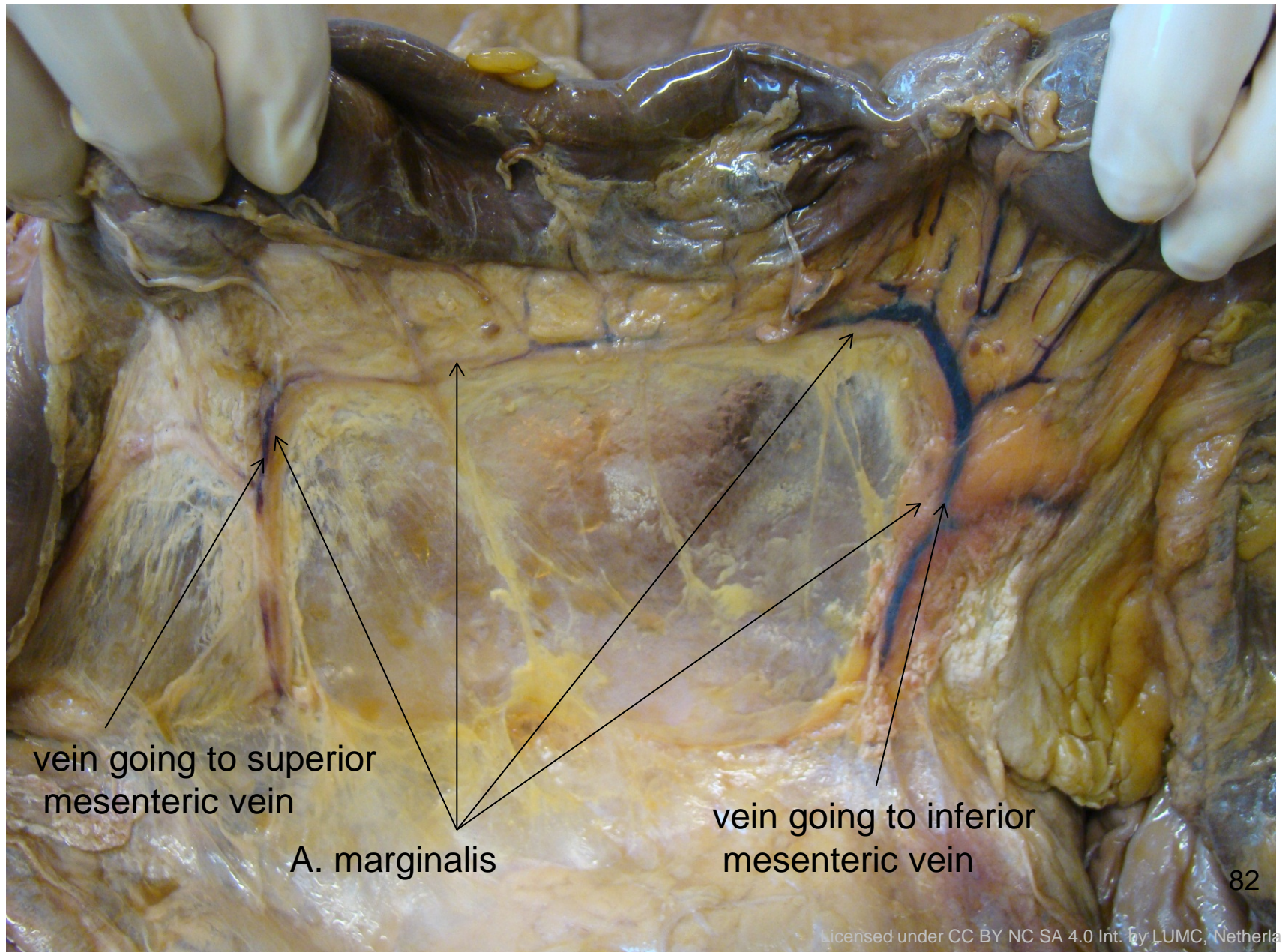


Blood vessels of Intestines

Blood vessels in Mesentery



Blood vessels in Transverse mesocolon



Blood vessels of jejunum

Vasa recta

Arcades



Blood vessels of jejunum
(view inside mesentery by opening one of its both peritoneal layers)

Vasa recta

Arcades



Blood vessels of ileum

Arcades

Vasa recta



Jejunum

Ileum

Note the difference in the configuration of the arcades and the vasa recta between jejunum and ileum!

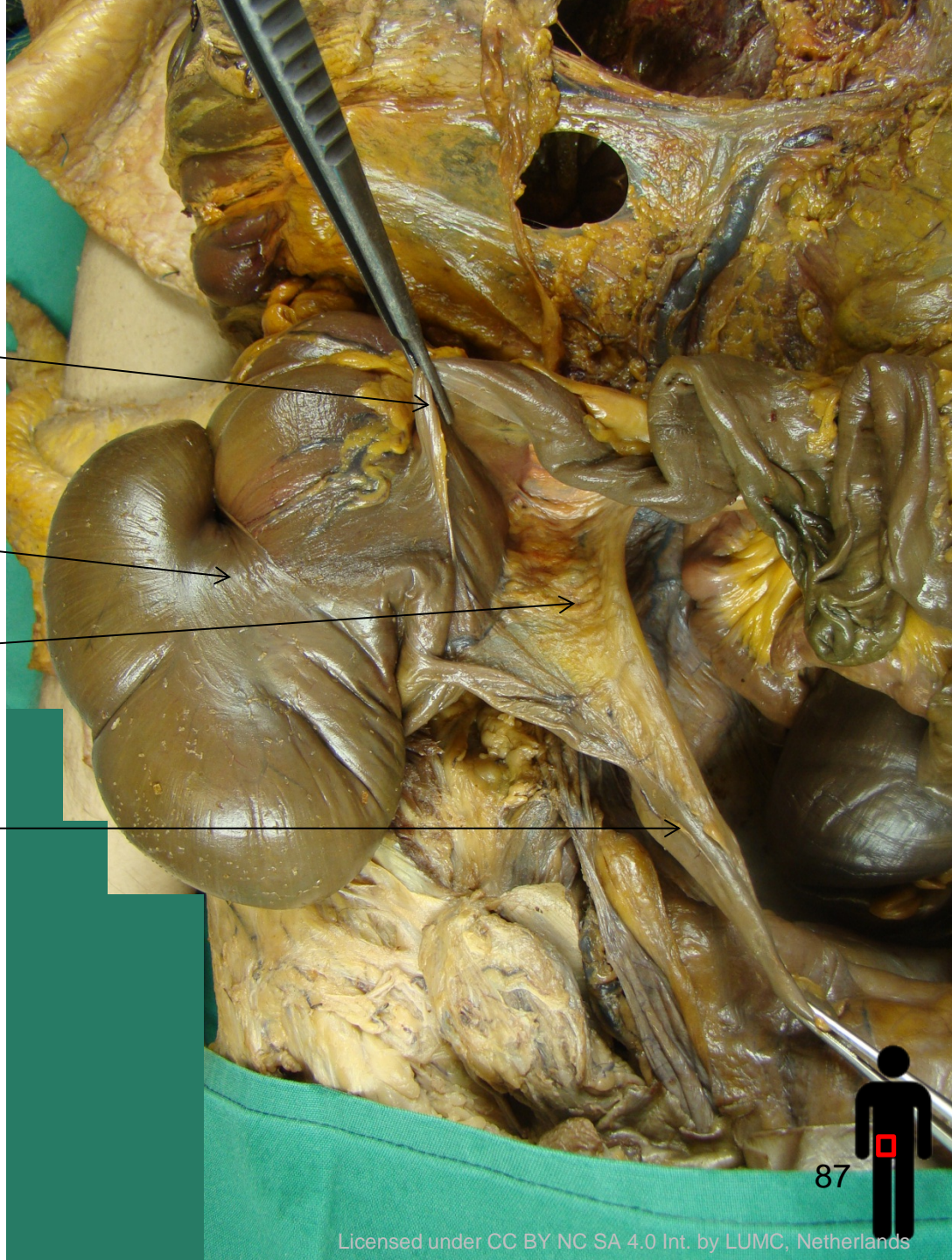


Ileocaecal junction

Caecum

Meso-appendix

Appendix



Superior mesenteric artery (1) and its branches:

- Jejunal arteries (2)
- Ileal arteries (3)
- Ileocaecal artery (4)
- Right colic arteries (5)
- Middle colic artery (6)
- Marginal artery (7)



Superior mesenteric vein (1) and its branches:

- Jejunal veins (2)
- Ileal veins (3)
- Ileocaecal vein (4)
- Right colic veins (5)
- Middle colic vein (6)

Note that the arteries are coloured light whilst the veins are coloured darker and are slightly wider. The veins lie directly adjacent to the arteries.



Inferior mesenteric artery (1) and its branches:

- Left colic artery (2)
- Sigmoid artery (3)
- Superior rectal artery (4)

Aorta (0)

Note that the left colic artery continues in the marginal artery (5)



Inferior mesenteric vein (1) and its branches:

- Left colic vein (2)
- Sigmoid vein (3)
- Superior rectal vein (4)

Note that the arteries are coloured light whilst the veins are coloured darker and are slightly wider. The veins lie directly adjacent to the arteries.



Intestines removed and posterior parietal peritoneum opened: view on posterior abdominal wall:

Celiac trunk

Superior mesenteric artery

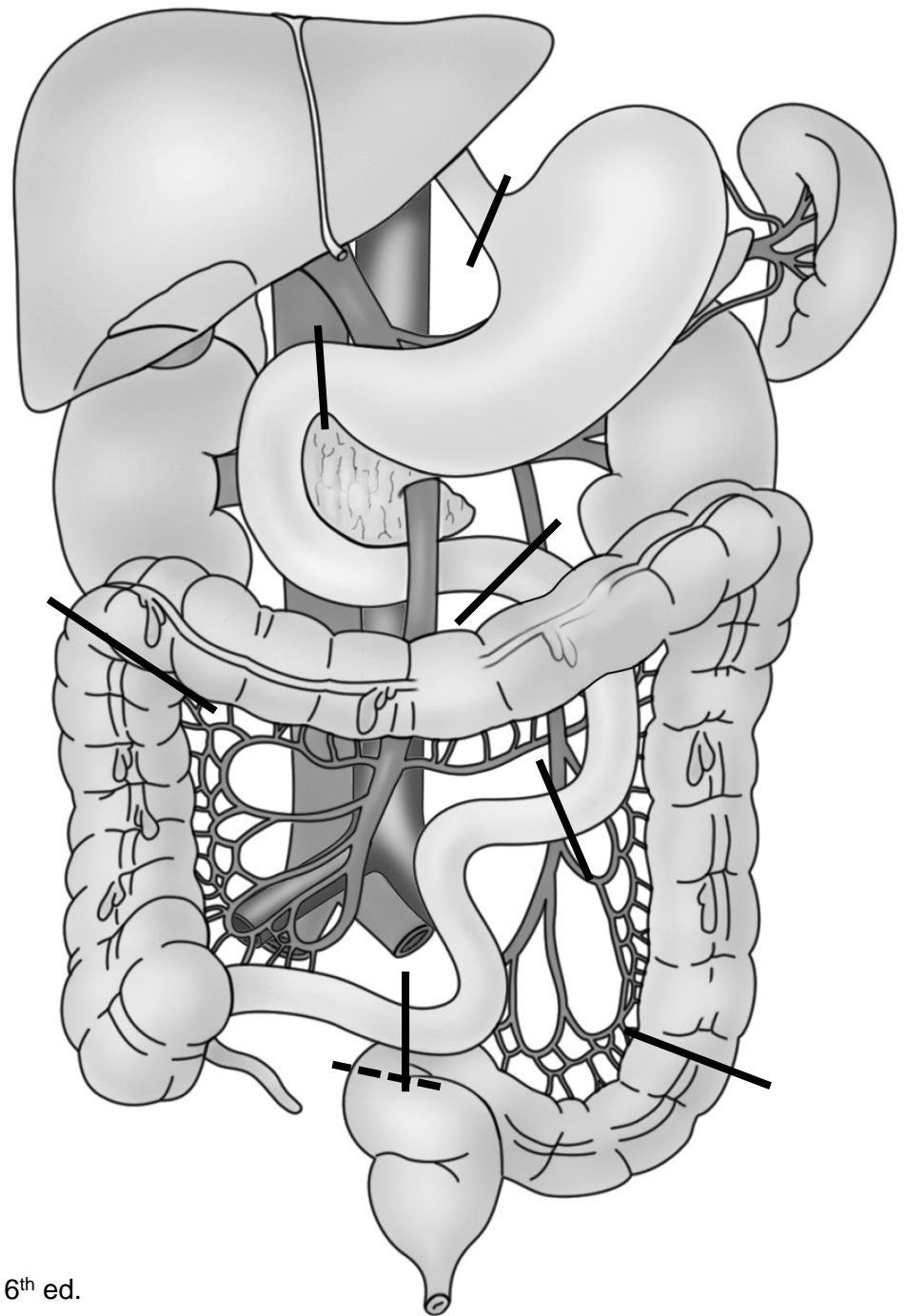
Inferior mesenteric artery



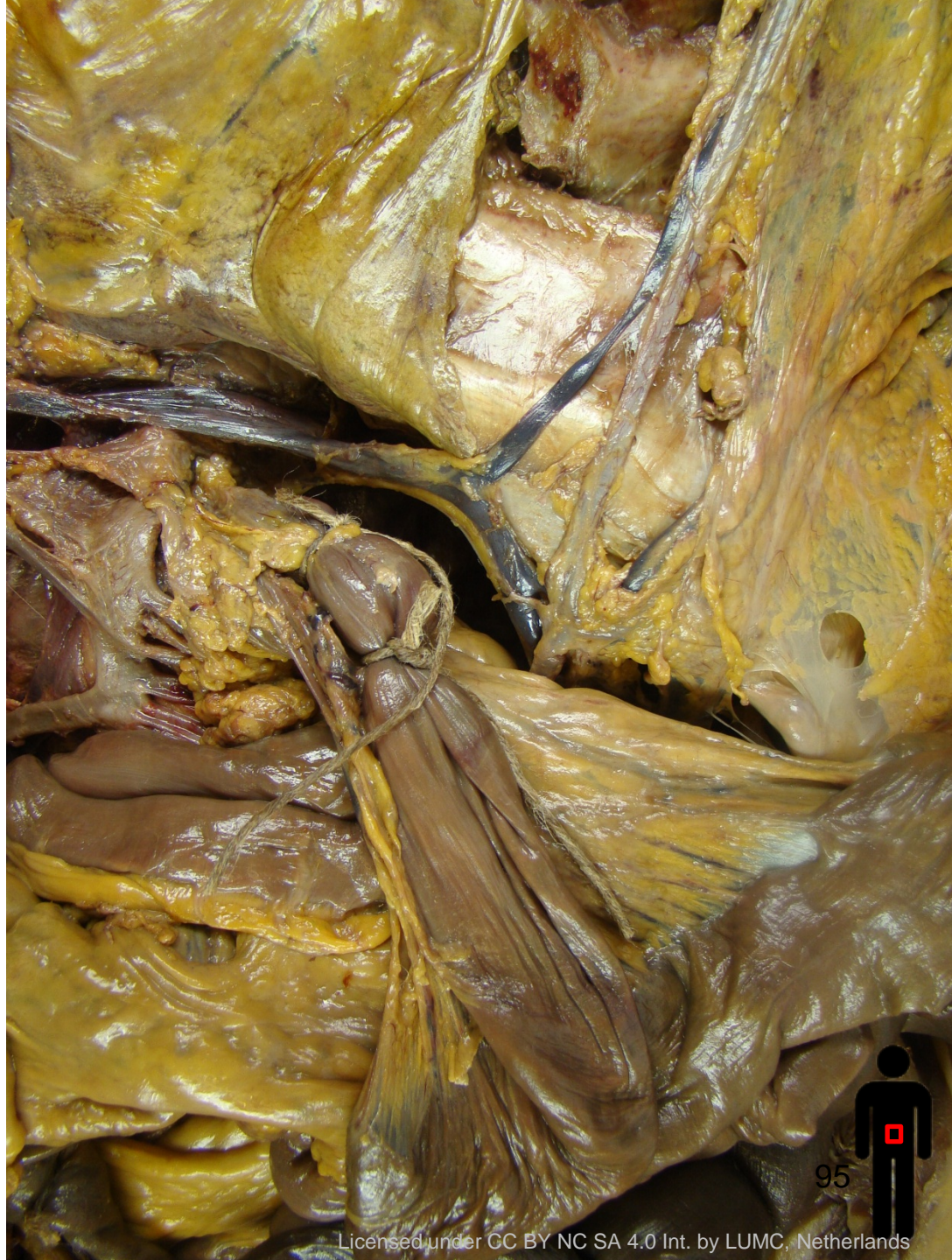
Removing and opening of intestines

Black lines indicate where the intestines will be cut.

First a double ligature is placed at these locations, then the intestine is cut between these pairs of ligatures.



Double ligation of duodenojejunal flexure



Double ligation of iliocaecal junction



Ligation of sigmoid colon



Jejunum (opened)

Mesentery

Mesenteric side

Anti mesenteric side

Plicae circulares
(Kerckring)



Jejunum

Plicae circularis



(Terminal) ileum

Plicae circularis

Possible Peyer's patch

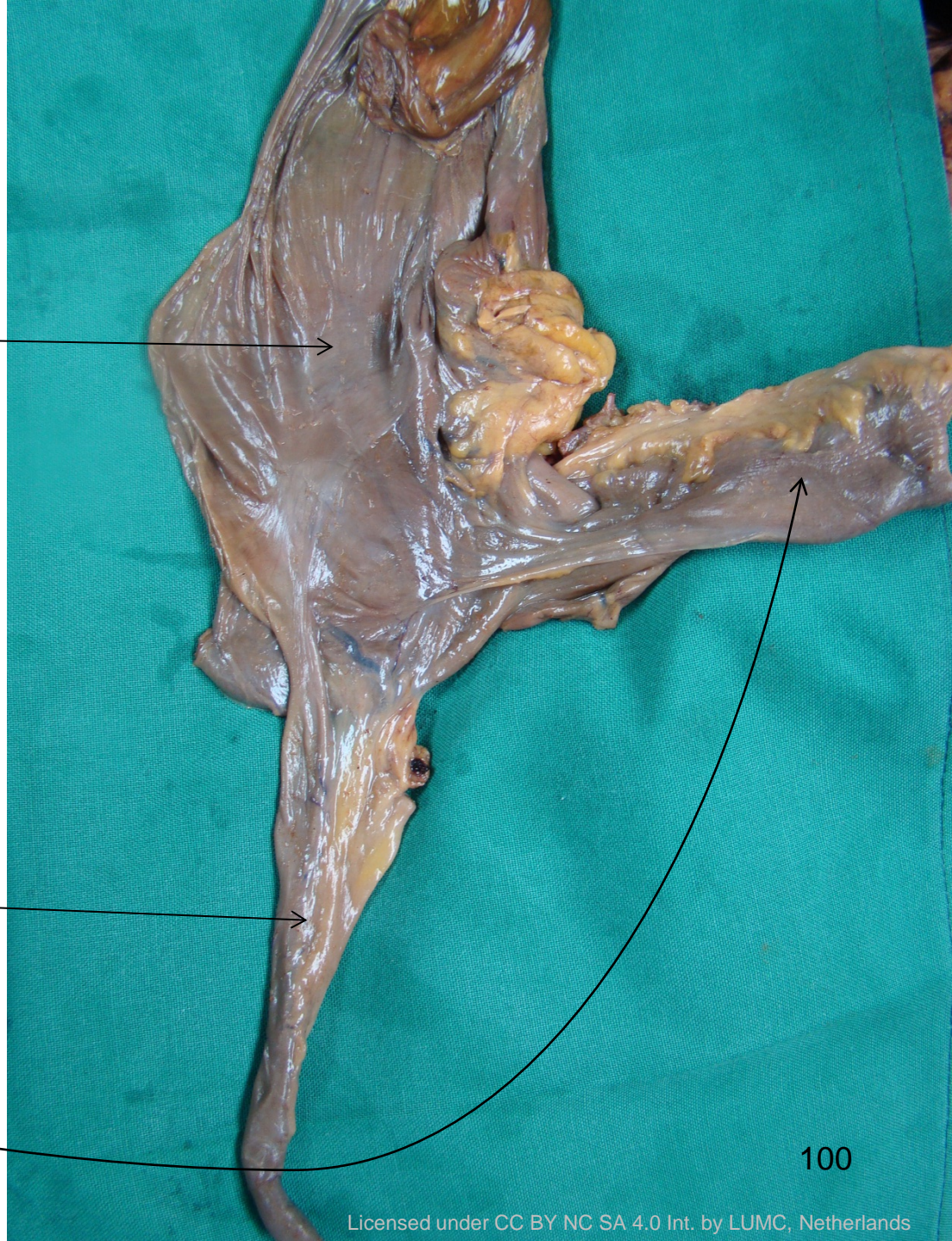


Ileocaecal junction

Caecum

Appendix

Ileum



Ileocaecal junction
(opened)

Caecum

Opening of ileum
(large blue arrow)

Opening of appendix

Appendix

Ileum



Ileocaecal junction
(opened)

Caecum

Ileocaecal valve

Appendix

Ileum



Sigmoid colon:

Tenia coli

Omental appendices

Mesocolon sigmoideum
(mesosigmoid)



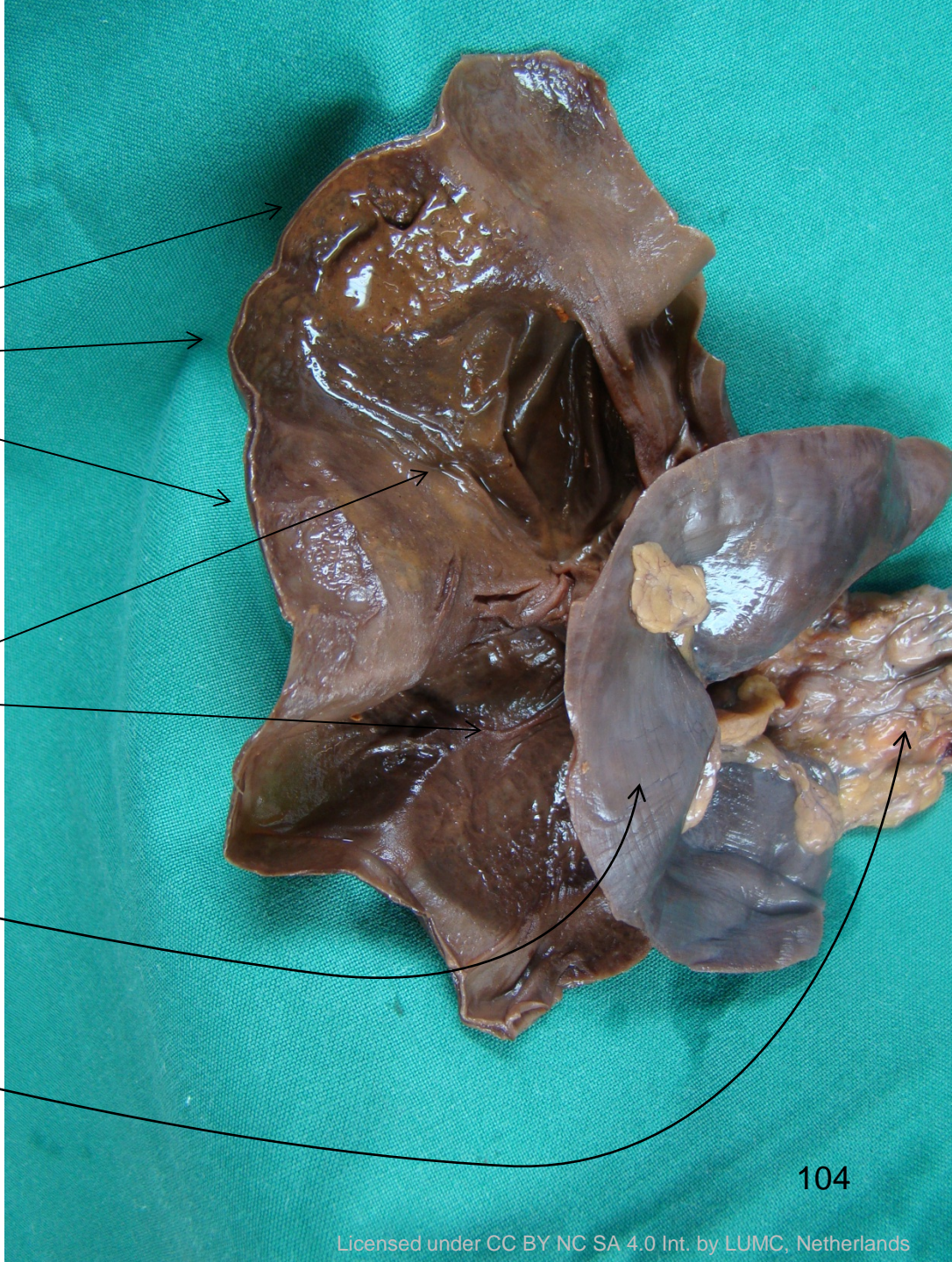
Sigmoid colon (opened)

Haustrae coli

Plicae semilunaris

Teniae coli

Mesocolon sigmoideum
(mesosigmoid)



Lesser omentum

Liver

Lobus caudatus of liver
showing through hole
in lesser omentum

Lesser omentum
(white dashed outline)

Stomach

Greater omentum

Transverse colon



Liver edge

Ligamentum teres hepatis

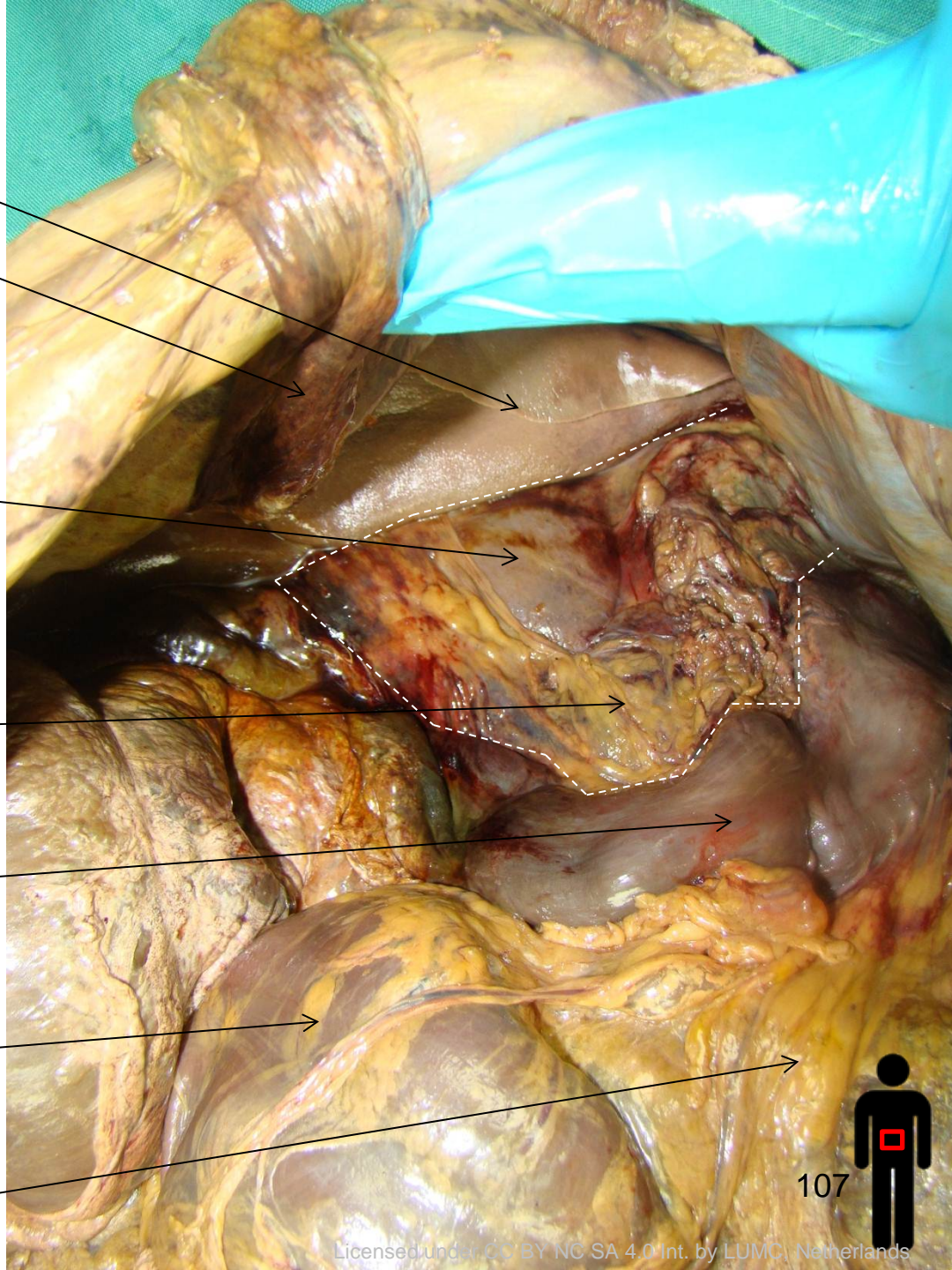
Lobus caudatus of liver showing through hole in lesser omentum

Lesser omentum

Stomach

Transverse colon

Greater omentum

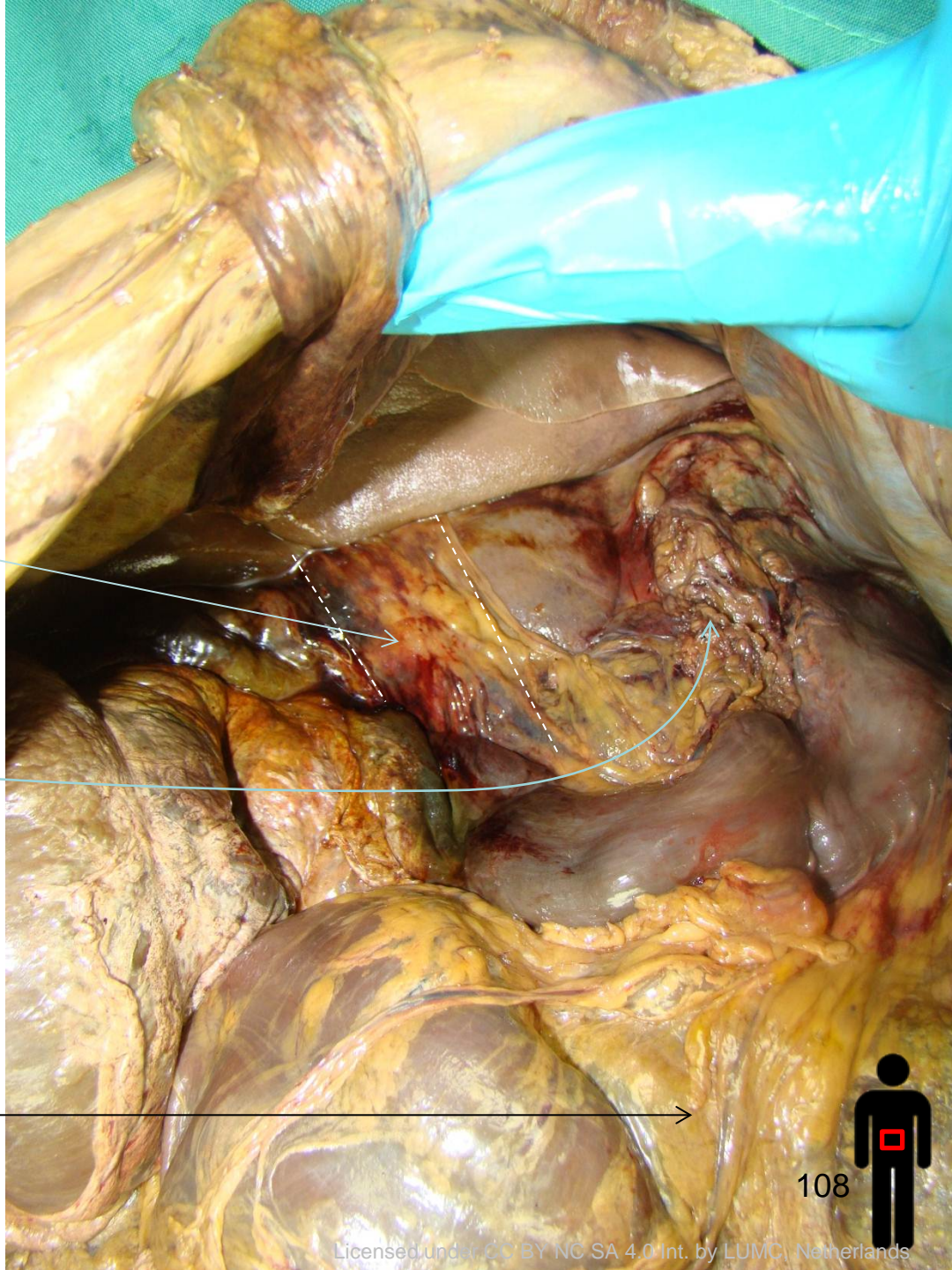


Lesser omentum can be divided into:

Hepatoduodenal ligament
(white dashed outline)

Hepatogastric ligament

Greater omentum



Hepatogastric ligament



Looking into omental bursa

Free edge of
hepatoduodenal ligament

Liver

Omental foramen
(looking into omental bursa)

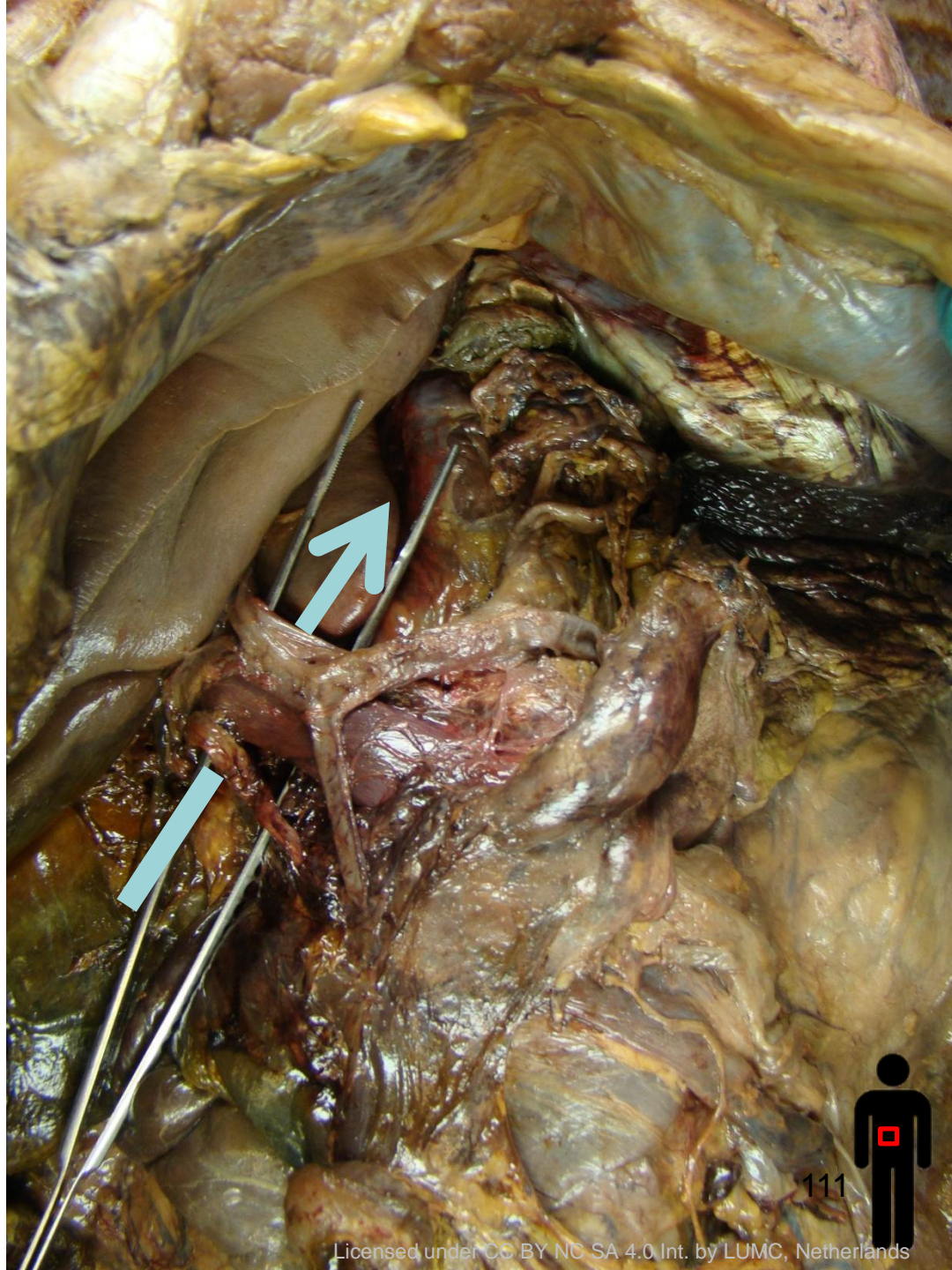
Gall bladder



Lesser omentum
removed

(structures in hepatoduodenal ligament exposed)

Pincers (and arrow)
through omental
foramen into bursa
omentalis



**Structures in hepatoduodenal
ligament**

and

Celiac Trunk derivatives

Common hepatic artery

Proper hepatic artery

Left hepatic artery

Right hepatic artery

Cystic artery

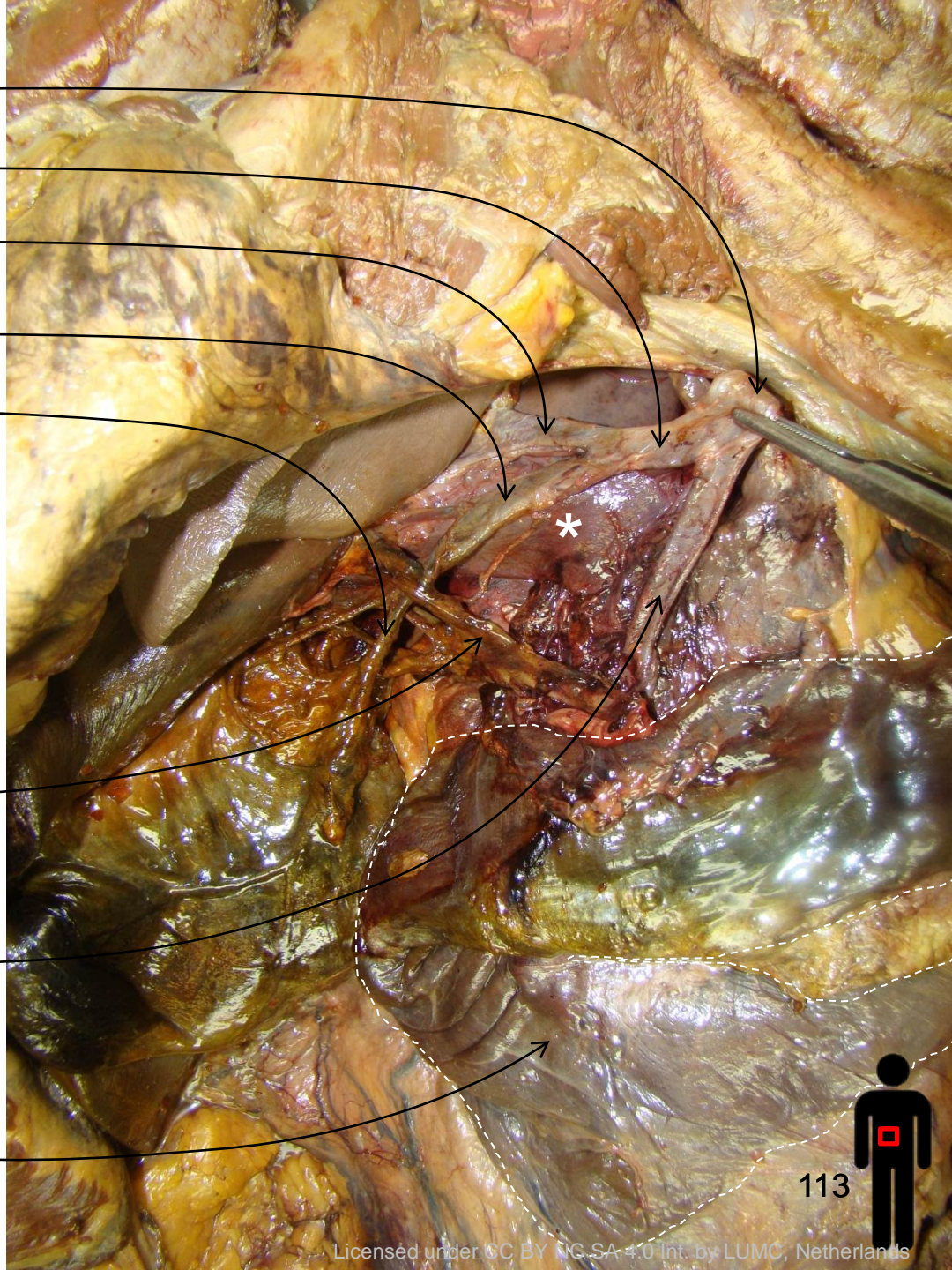
Portal vein*

Common bile duct

Gastroduodenal artery

Duodenum

(white dashed outline)



Left hepatic duct

Right hepatic duct

Cystic artery

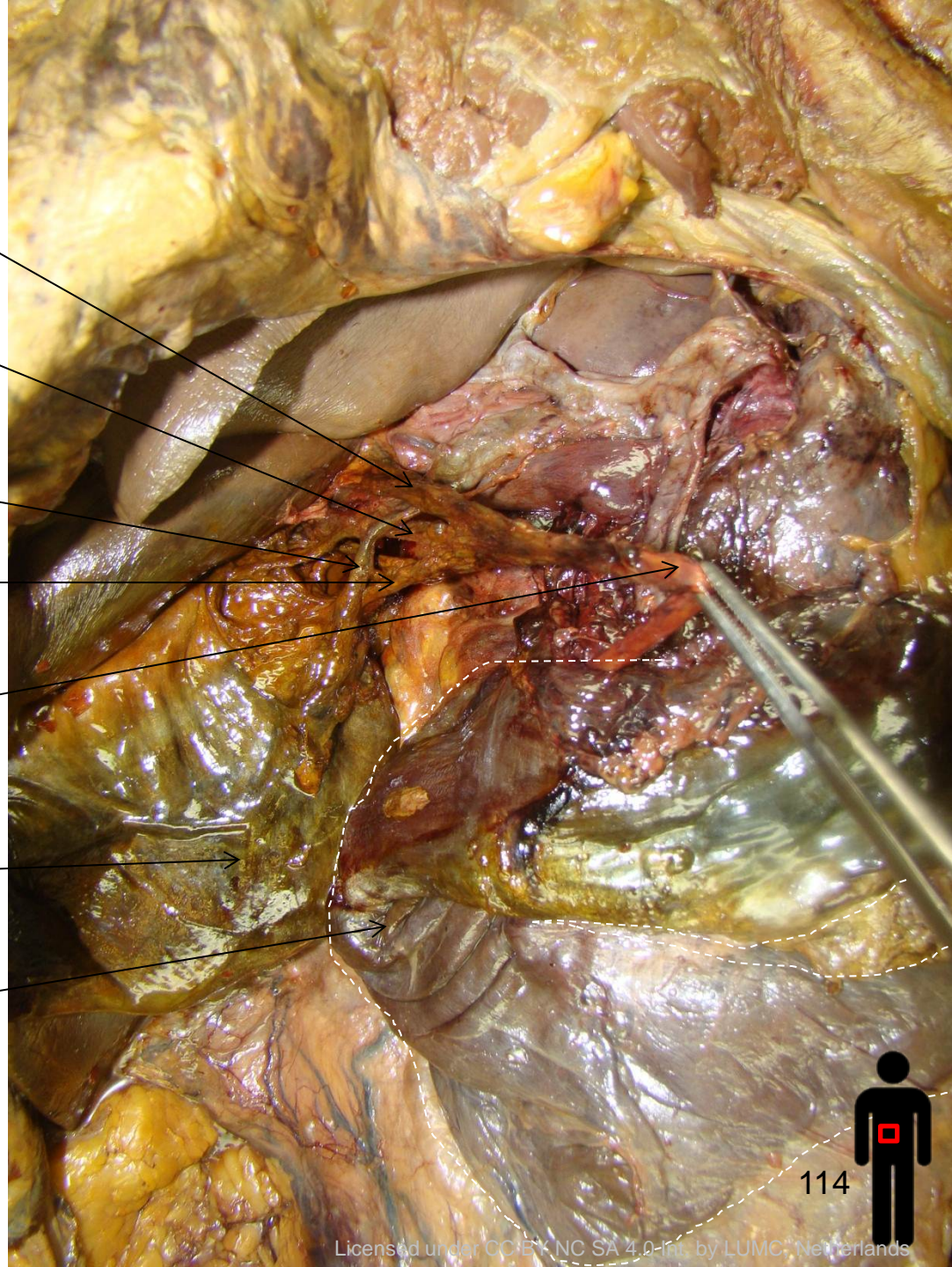
Cystic duct

Common bile duct

Gall bladder

Duodenum

(white dashed outline)



Celiac trunk

Splenic artery

(note the coiling)

Hepatic artery

Pancreas

Duodenum



Left gastric artery

Celiac trunk
(white dashed outline)

Splenic artery

Proper hepatic artery

Common hepatic artery

Portal vein

Gastrooduodenal artery

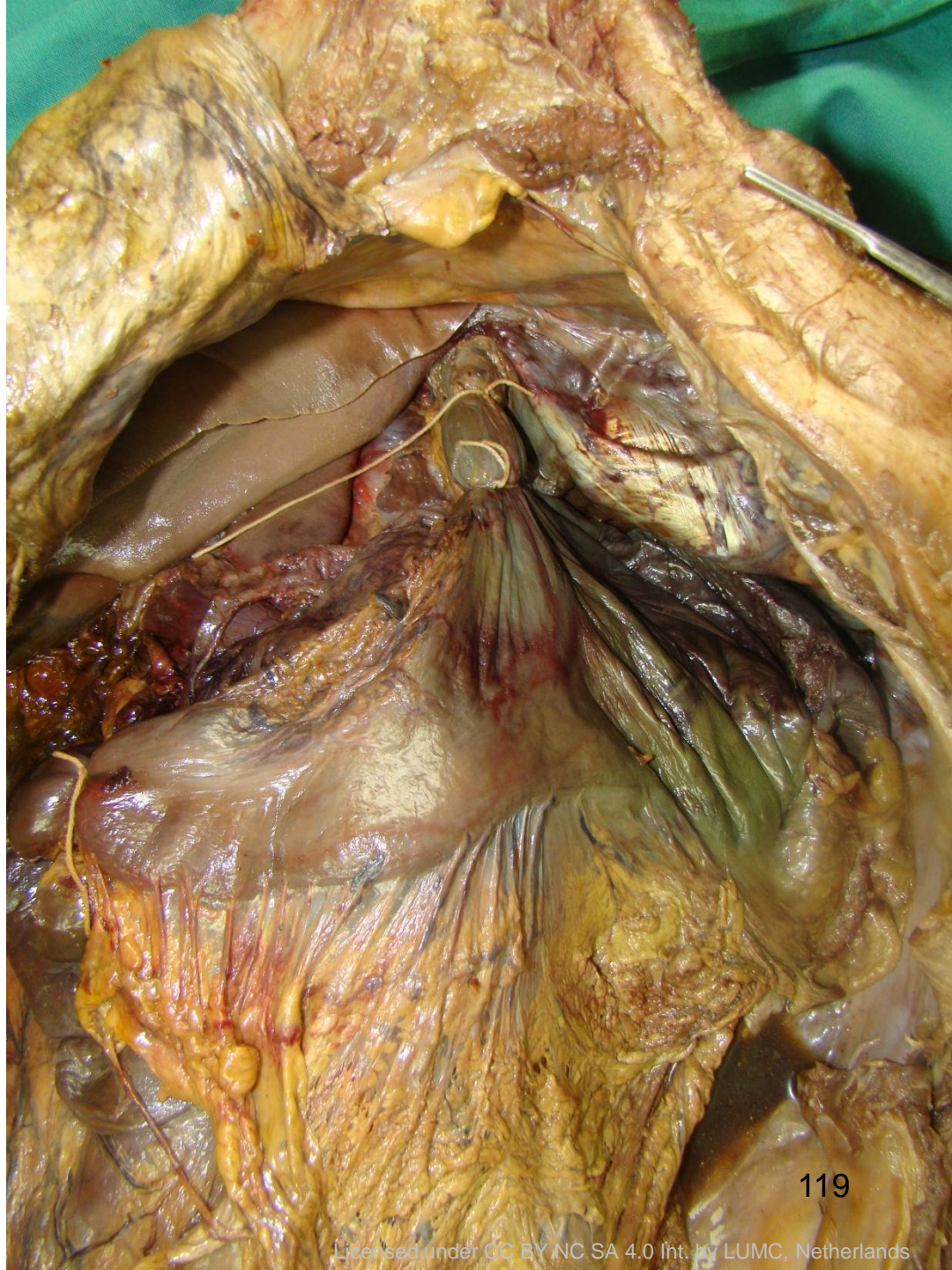


Stomach

Double ligation of duodenopyloric part



Double ligation on
gastro-esophageal
junction



Fundus

Cardia

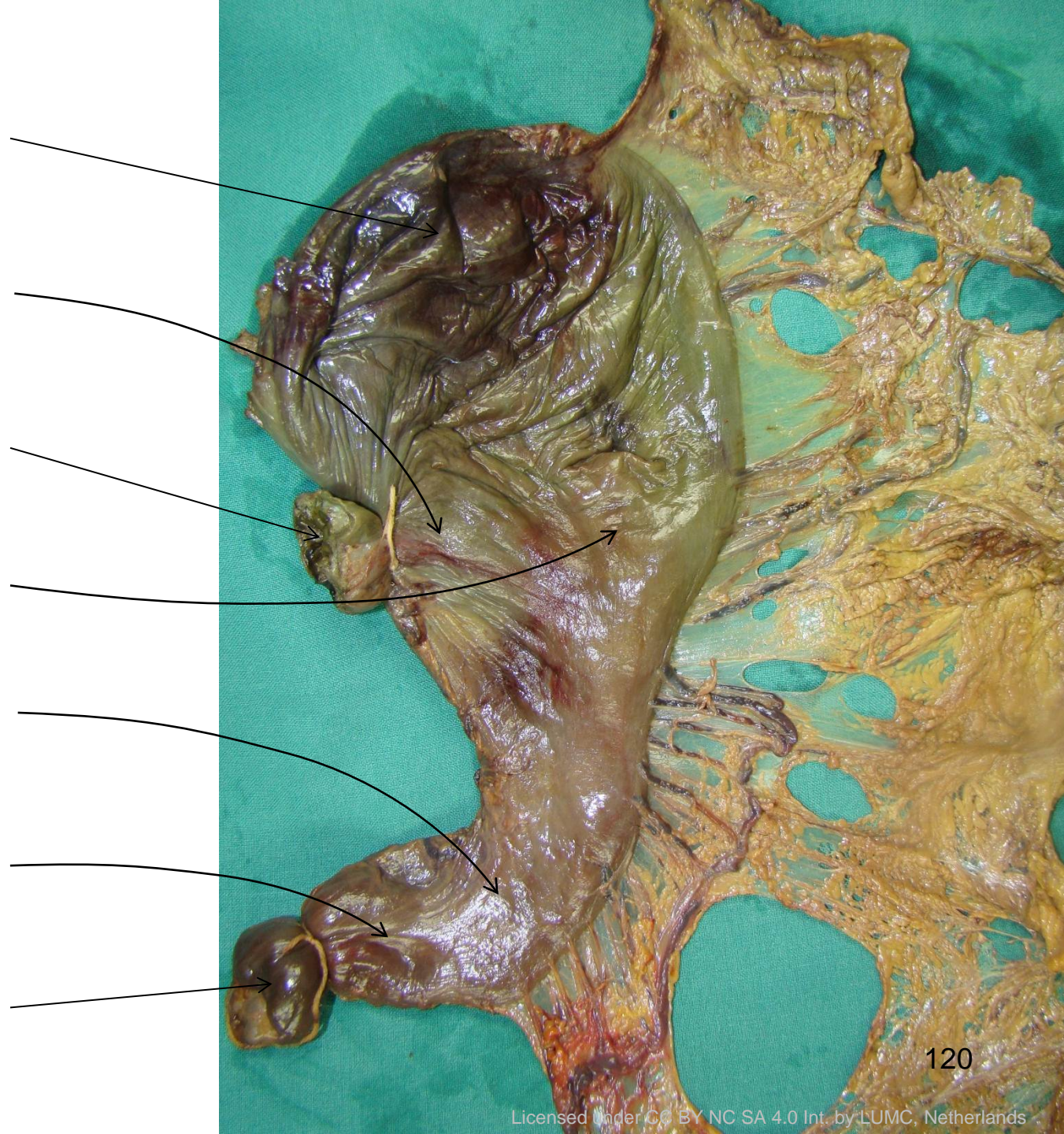
Esophagus

Body

Pyloric antrum

Pyloric canal

Duodenum



Stomach and greater omentum

Left gastro-epiploic artery

Right gastro-epiploic artery



Stomach opened

Pyloric sphincter muscle



Liver

Costal margin

Falciform ligament

Teres hepatis ligament

Diaphragm
(covered by peritoneum)

Liver

Gall bladder



Frontal view of liver

(viewing slightly from the medial, also exposing the liver's inferior side (inf))

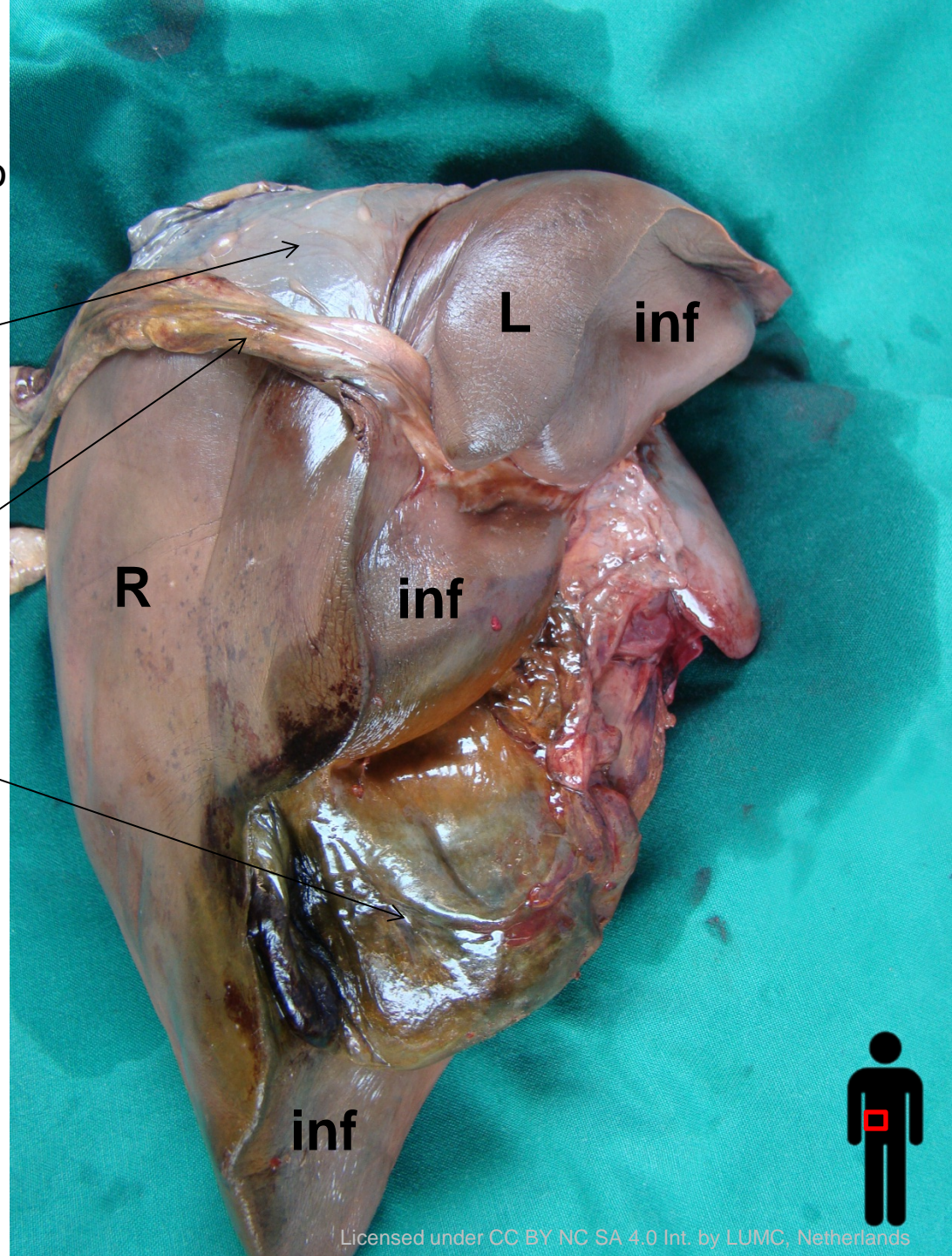
Falciform ligament
(lying folded over liver)

Teres hepatis ligament

Gall bladder

Left lobe (L)

Right lobe (R)



Superoanterior view of liver

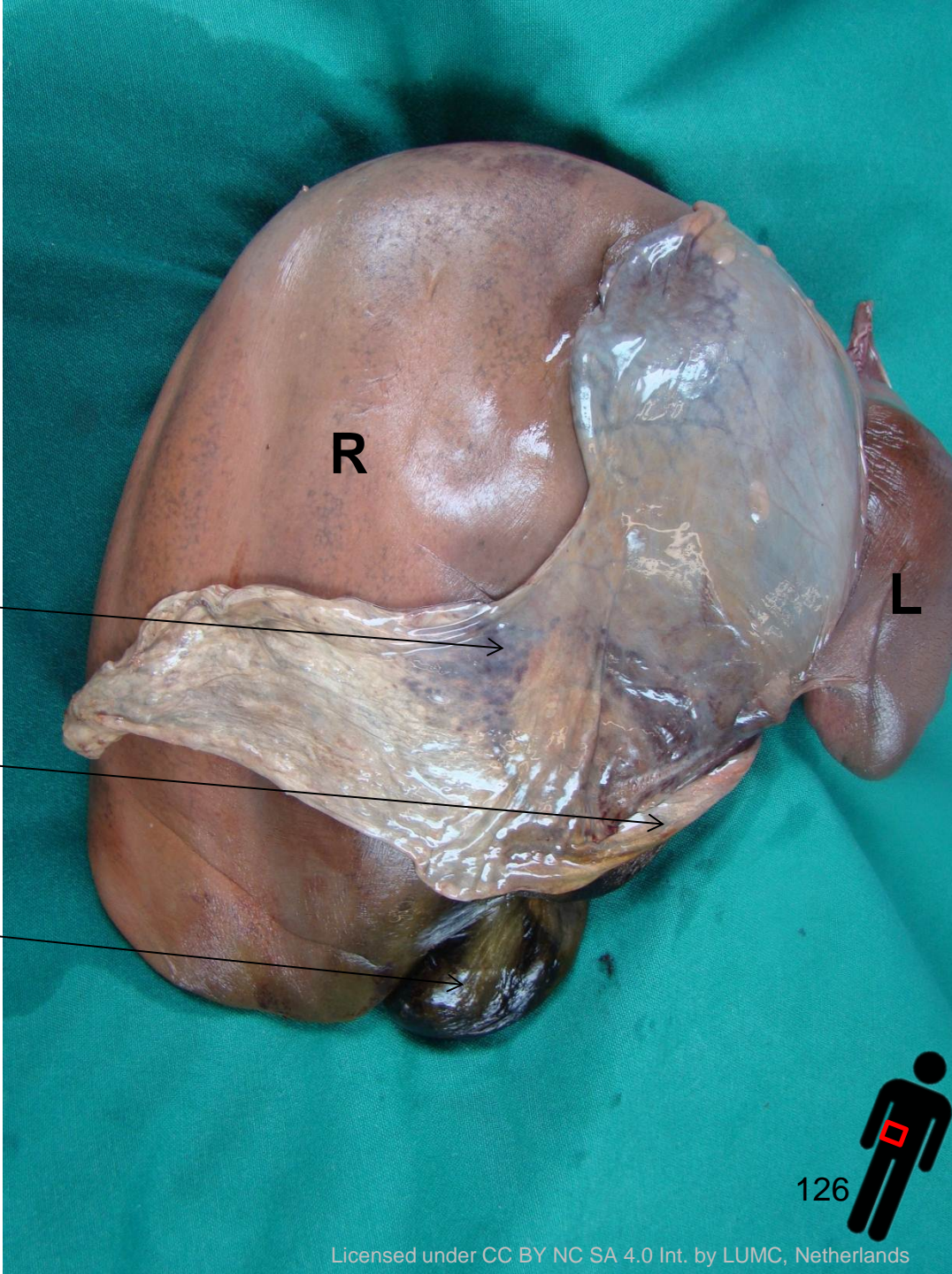
Right lobe (R)

Left lobe (L)

Falciform ligament

Teres hepatis ligament

Gall bladder



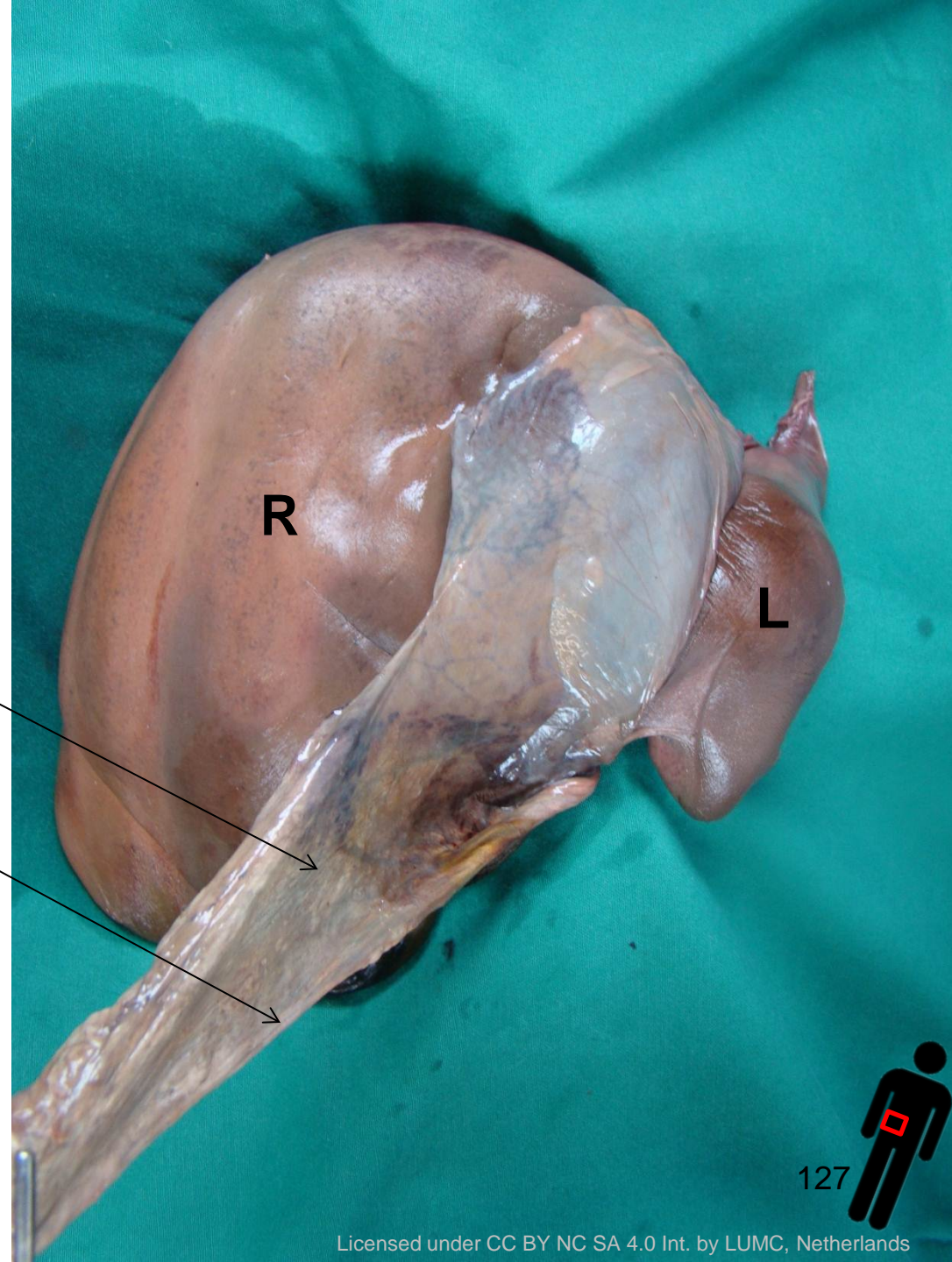
Superoanterior view of liver

Right lobe (R)

Left lobe (L)

Falciform ligament
(stretched)

Teres hepatis ligament



Superior view

Left lobe

Hepatic veins opening
into Inferior Vena Cava

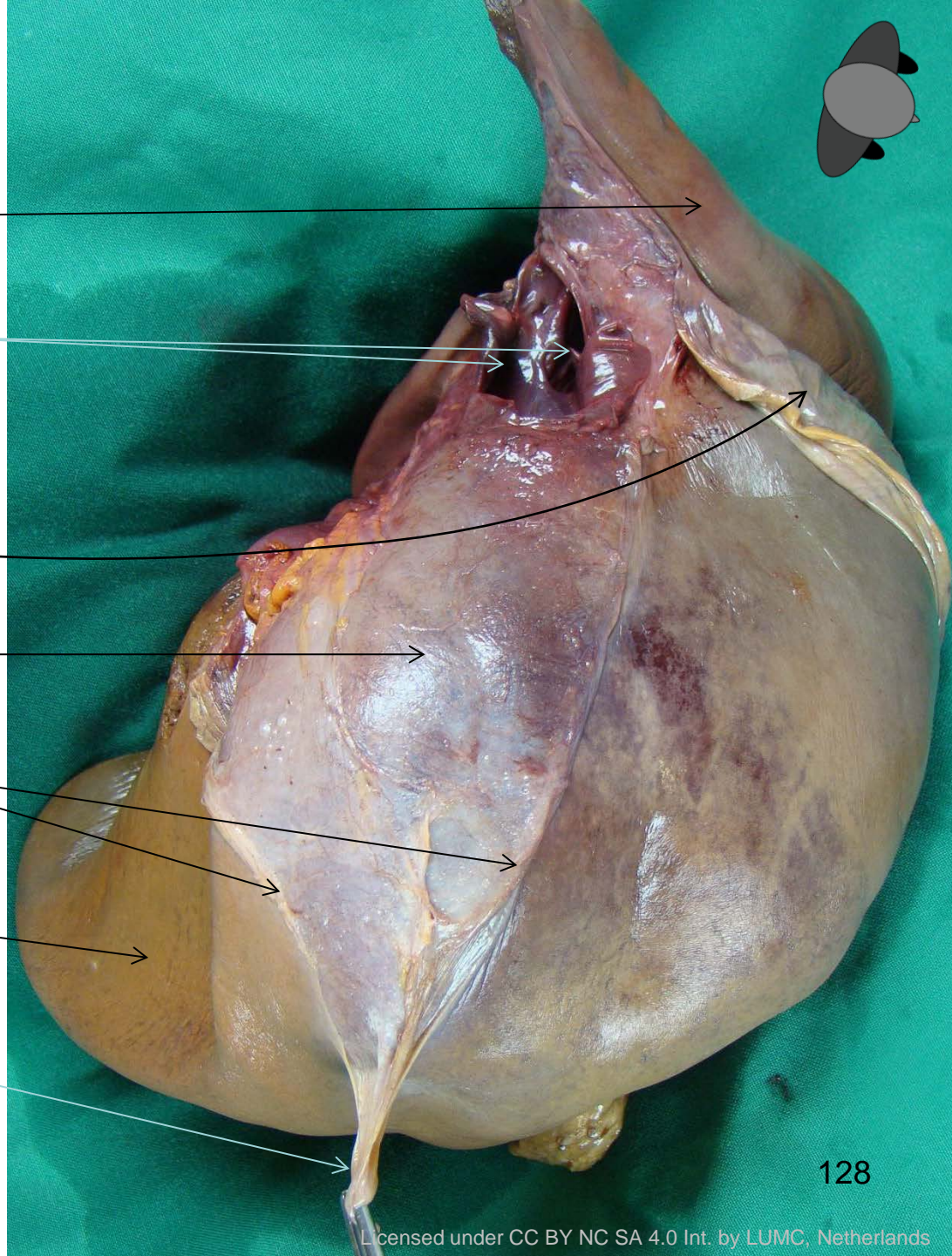
Falciform ligament

Bare area of liver

Coronary ligament

Right lobe

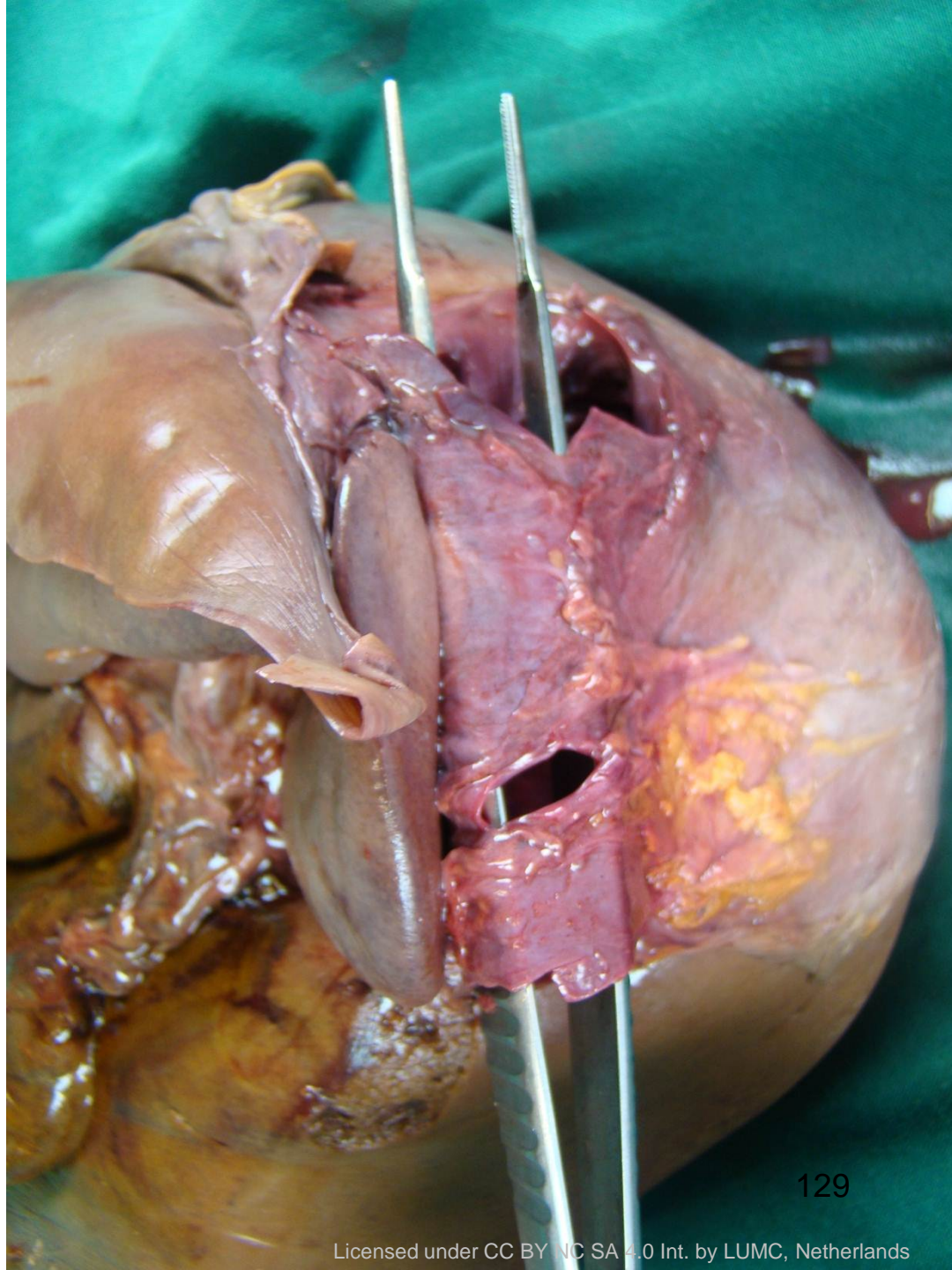
Right Triangular
ligament



Posterior view

Pincers inside

Inferior Vena Cava



Inferior surface of liver

Left lobe (L)

Teres hepatis lig. (TH)

Caudate lobe

Quadrangle lobe

Porta hepatis containing:

Hepatic artery (HA)

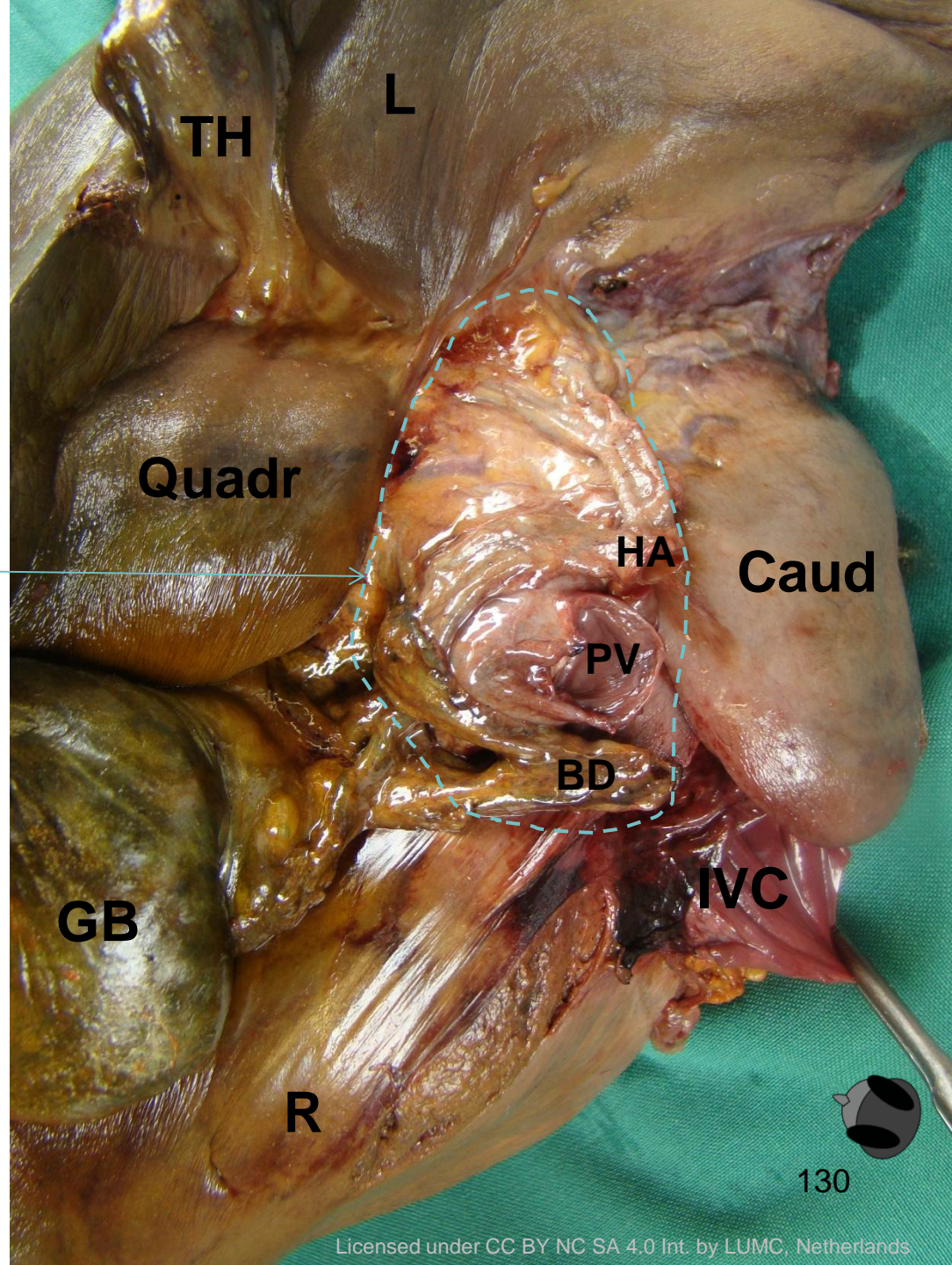
Portal vein (PV)

Bile duct (BD)

Gall bladder (GB)

Inferior vena cava (IVC)

Right lobe (R)



Inferior surface of liver

Porta hepatis:

Hepatic artery (HA)

Left hepatic artery

Right hepatic artery

Cystic artery

Portal vein (PV)

Bile duct (BD)

Hepatic duct

Cystic duct



Prenatal blood flow

(red dotted line)

Teres hepatis lig. (TH)

(embryol: umbilical vein)

to:

Portal vein (PV)

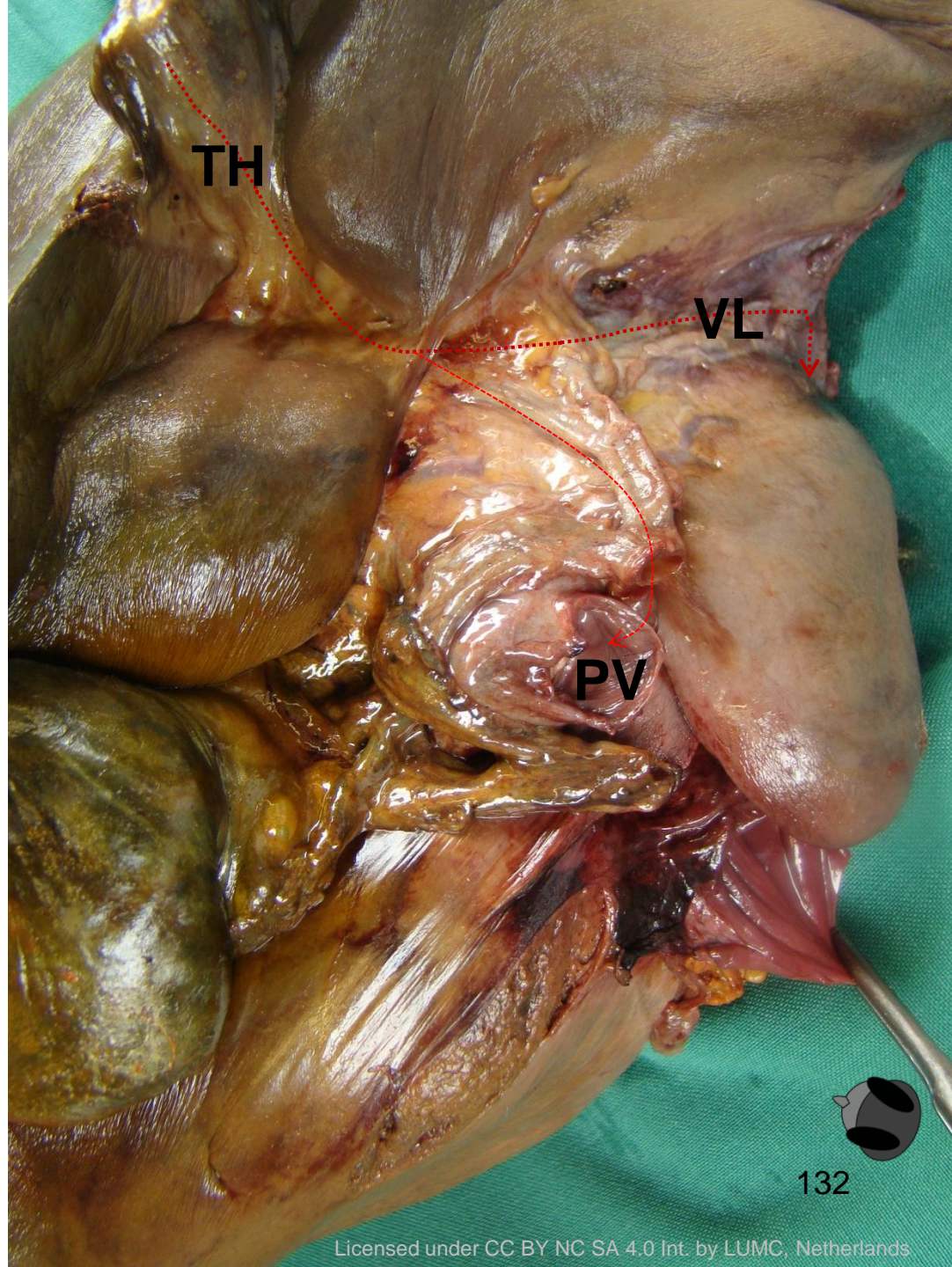
blood must pass through liver

and:

Venous ligament (VL)

(embryol: venous duct)

shortcut to Inferior Vena Cava



Porta hepatis (closeup)

Hepatic artery

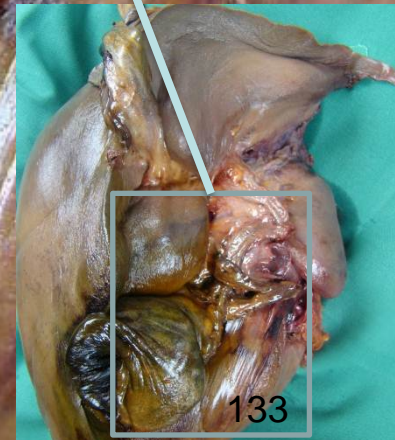
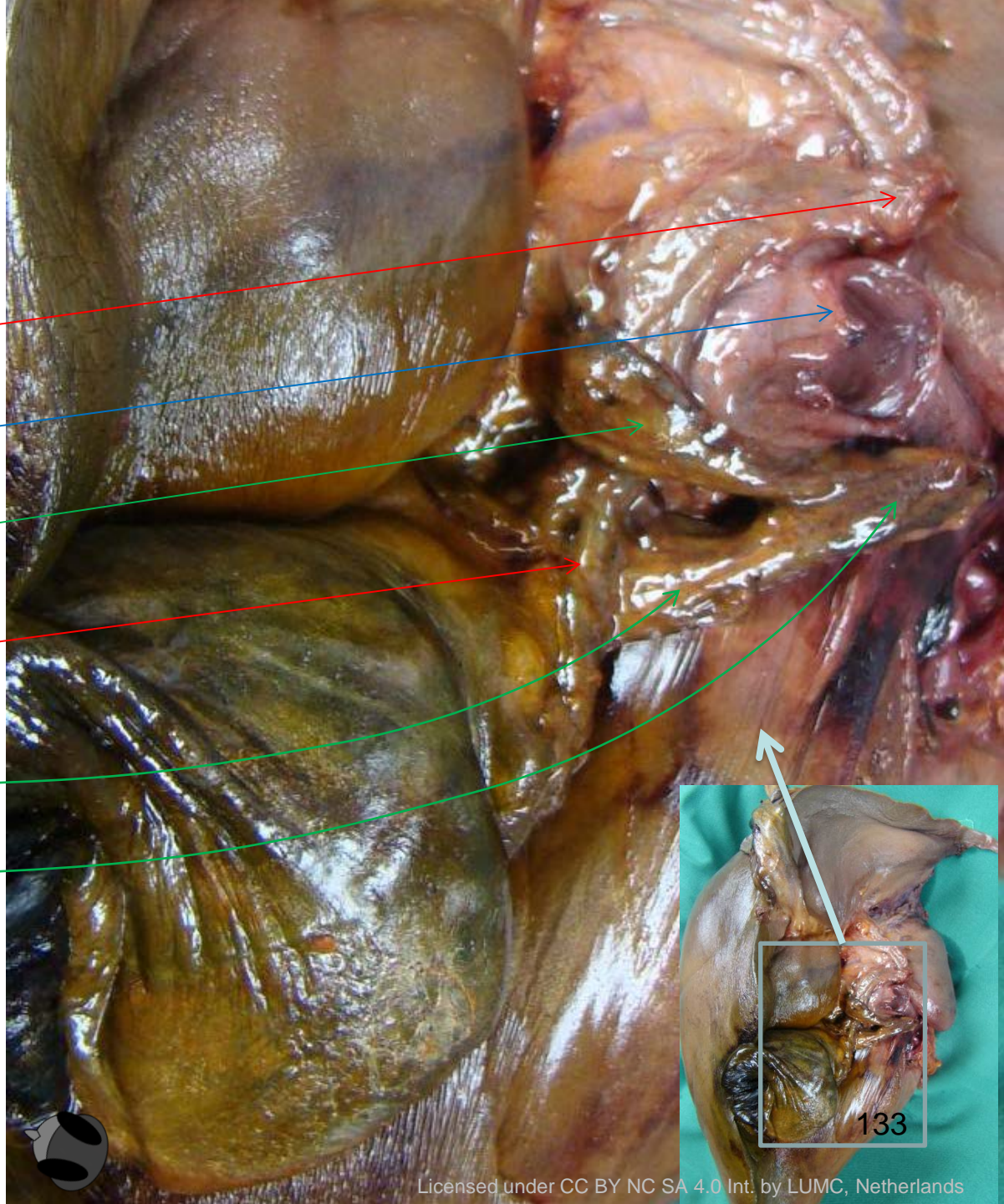
Portal vein

Hepatic duct

Cystic artery

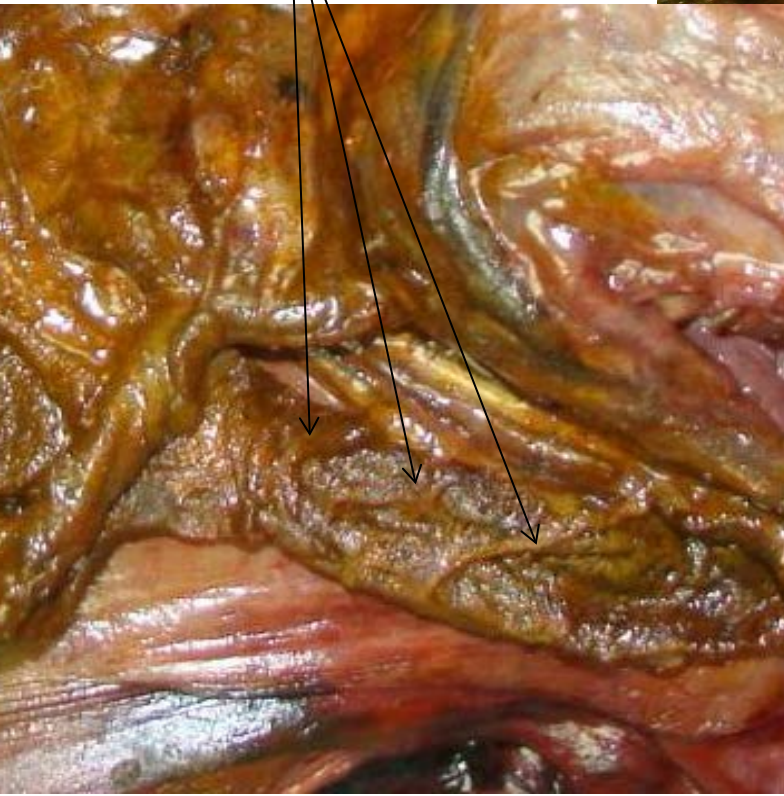
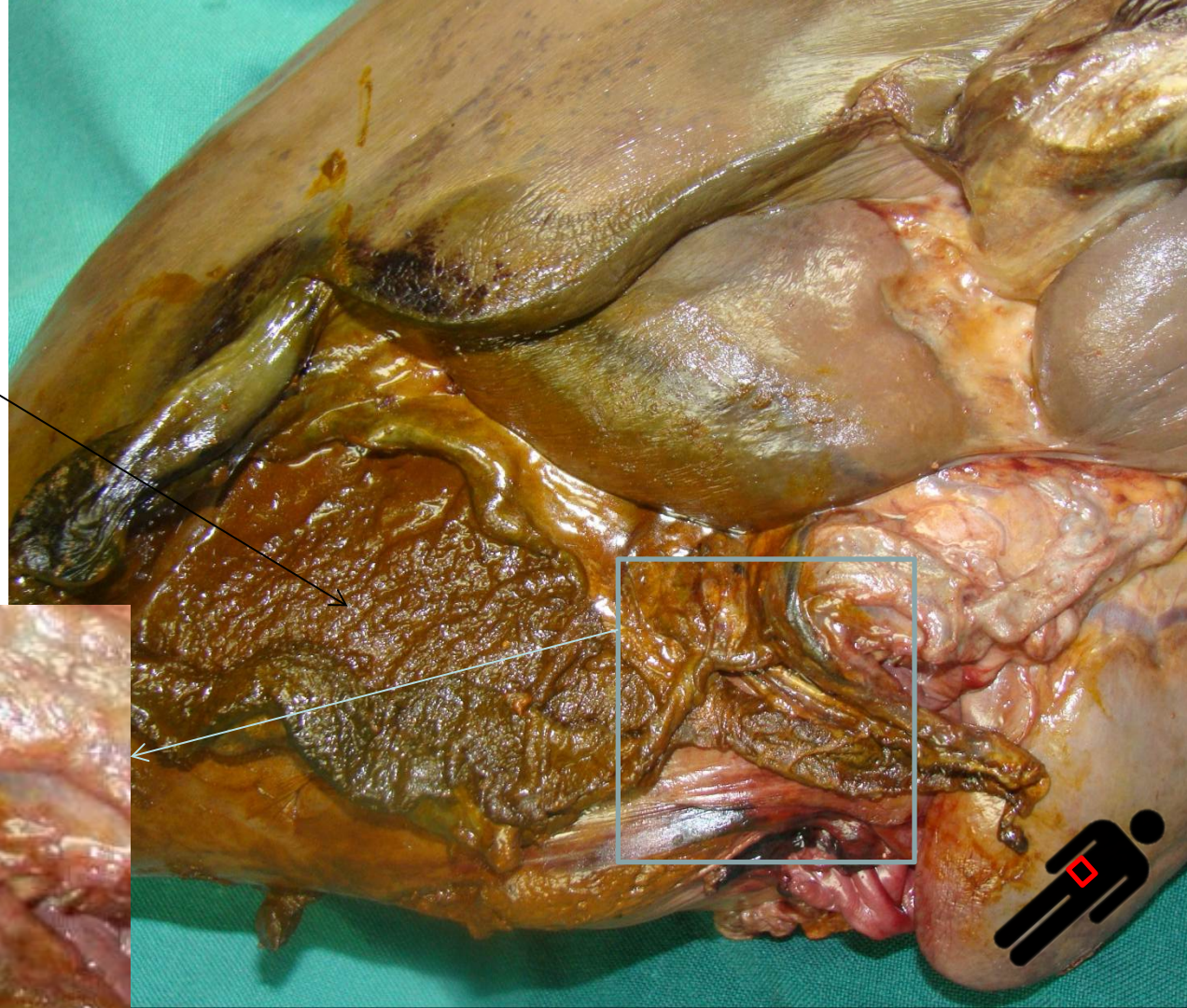
Cystic duct

Common bile duct



Gall bladder
opened

Plica spiralis
heisteri



Liver in slices

Liver in slices

Transversely
cut

view on slices from inferior



Liver in slices

Transversely
cut

view on slices from inferior



Porta hepatis:

Hepatic Artery

Common bile duct

Portal vein

Hepatic vein branches
(thin wall)

Portal vein branches
(thicker wall)



Hepatic vein

Portal veins

(recognizable by
whitish wall)

Inferior Vena Cava



Pancreas

Posterior view

Duodenum

Common bile duct

Spleen

Splenic artery

Pancreas

Portal vein

Infer. mesenter. vein

Splenic vein

Superior mesenter. vein



Head of pancreas and
duodenum

posterior view

Common bile duct

Main pancreatic duct

Hepatopancreatic
ampulla

Accessory pancreatic
duct



Closeup

(Posterior view)

There are many variants. In this case the major papilla (Vater's papilla) (into which the hepatopancreatic ampulla ends) lies at the superior part of the head of the pancreas.

Main pancreatic duct

Accessory pancreatic duct

Common bile duct

Hepatopancreatic ampulla



Pancreatic slices

Pancreatic duct



Spleen

Spleen in slices



Renal and gonadal blood vessels and ureters

Inferior vena cava

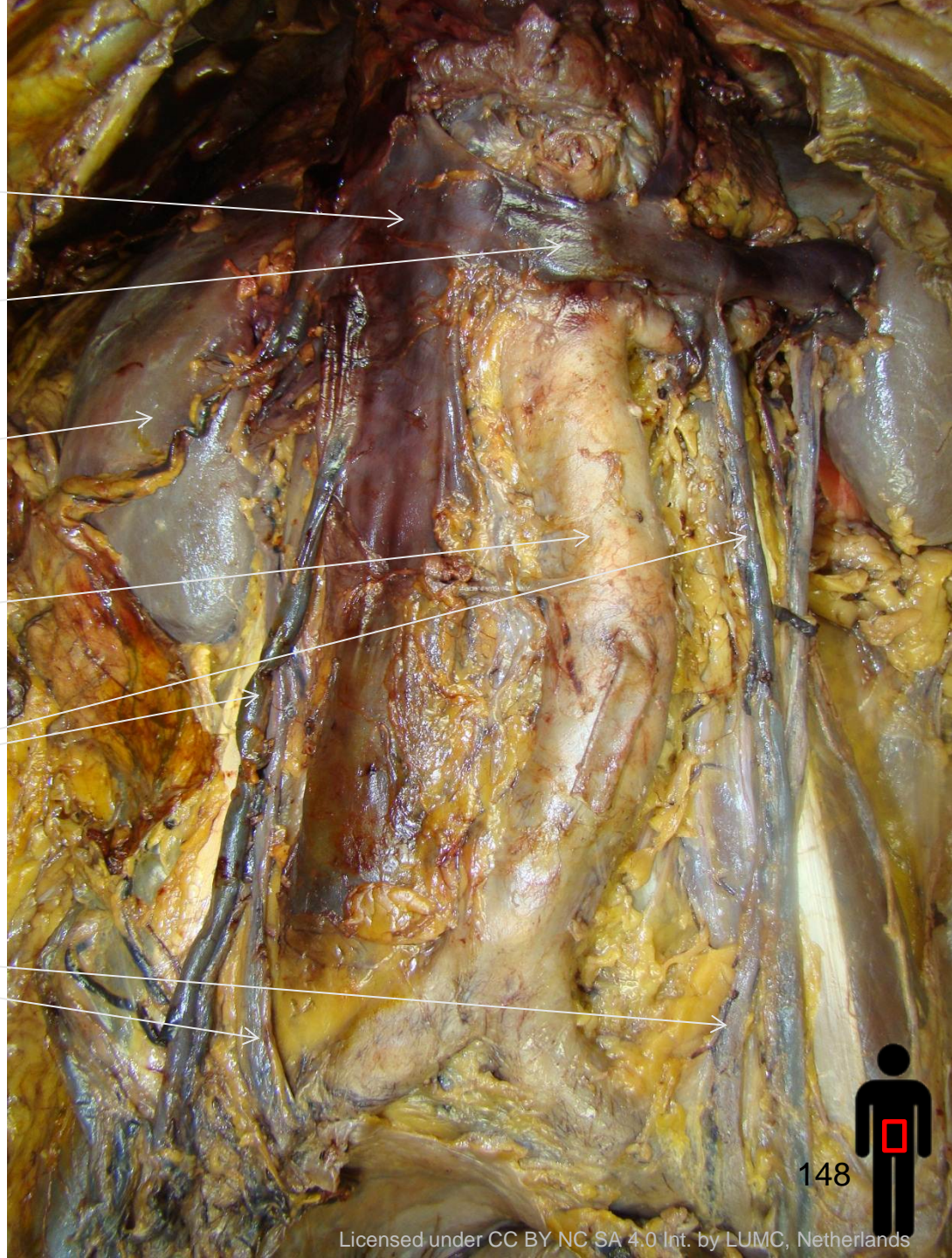
Left renal vein

Right kidney

Abdominal aorta

Testicular veins

Ureters



Closeup

Celiac trunk

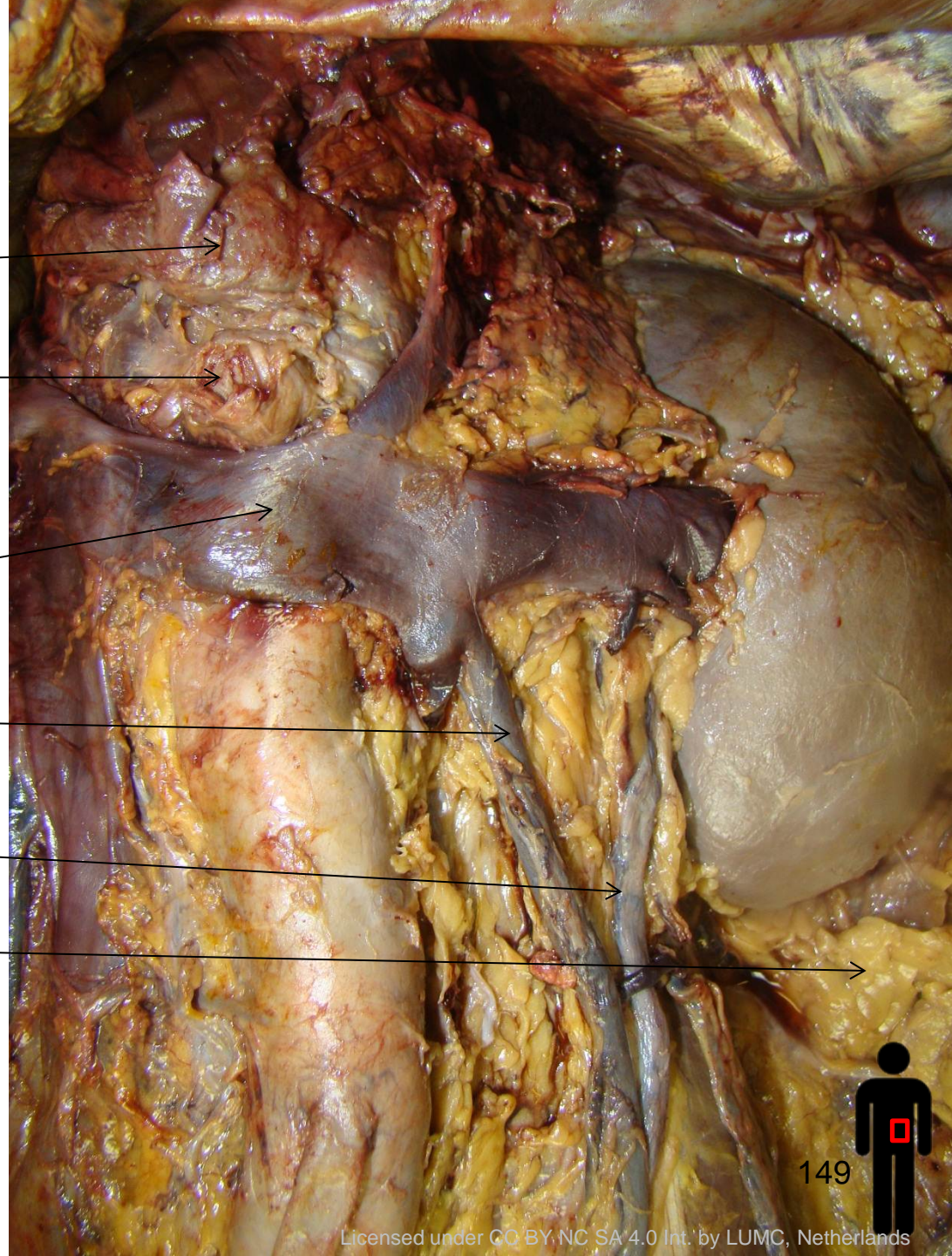
Superior mesenteric
artery (cut)

Left renal vein

Left testicular vein

Left ureter

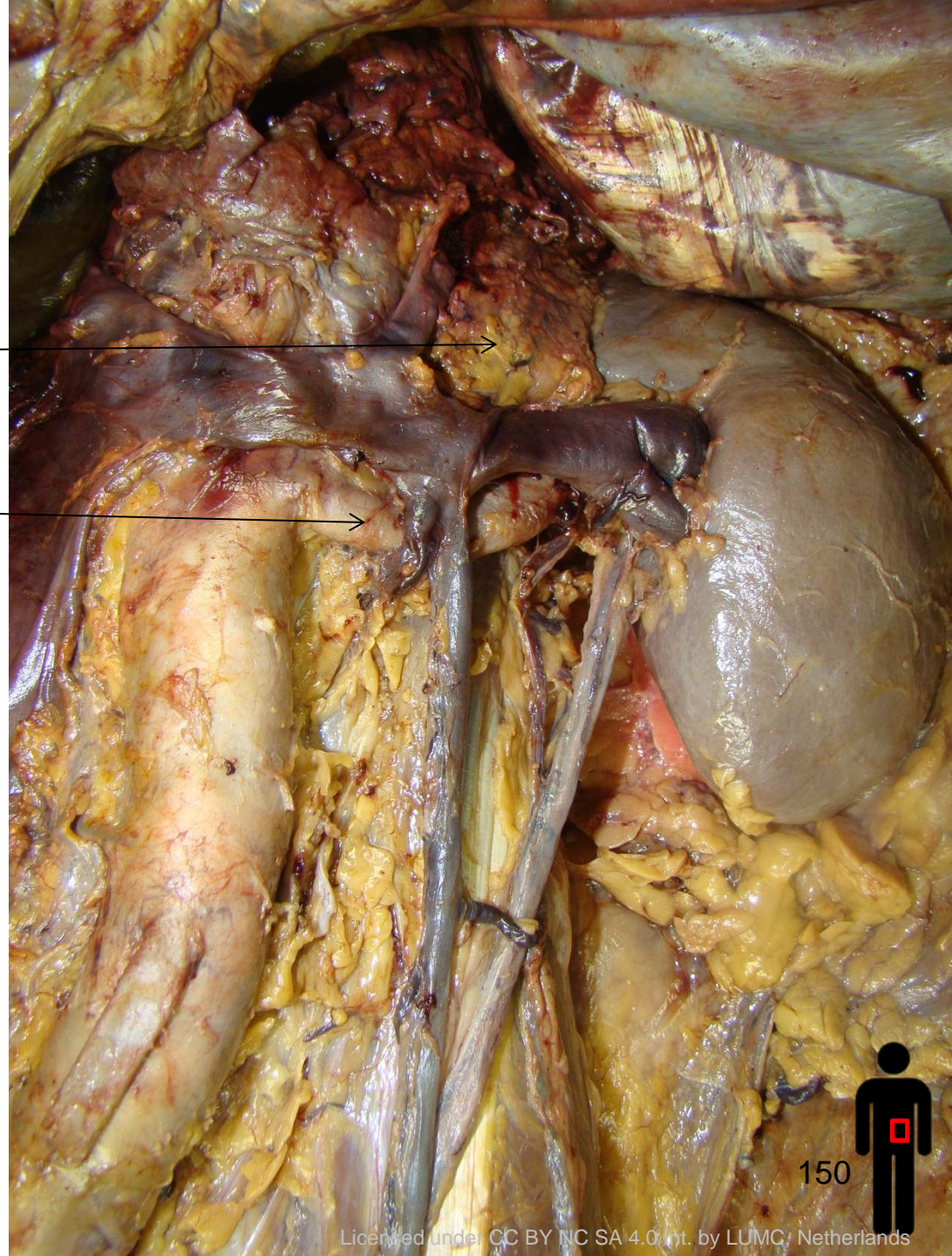
Pararenal fat tissue



Closeup

Suprarenal gland

Left renal artery



Overview

Testicular vessels

Ureters

Common iliac arteries

Pelvis



Closeup lower abdomen

Ureters

Common iliac arteries

Testicular vessels

External iliac artery

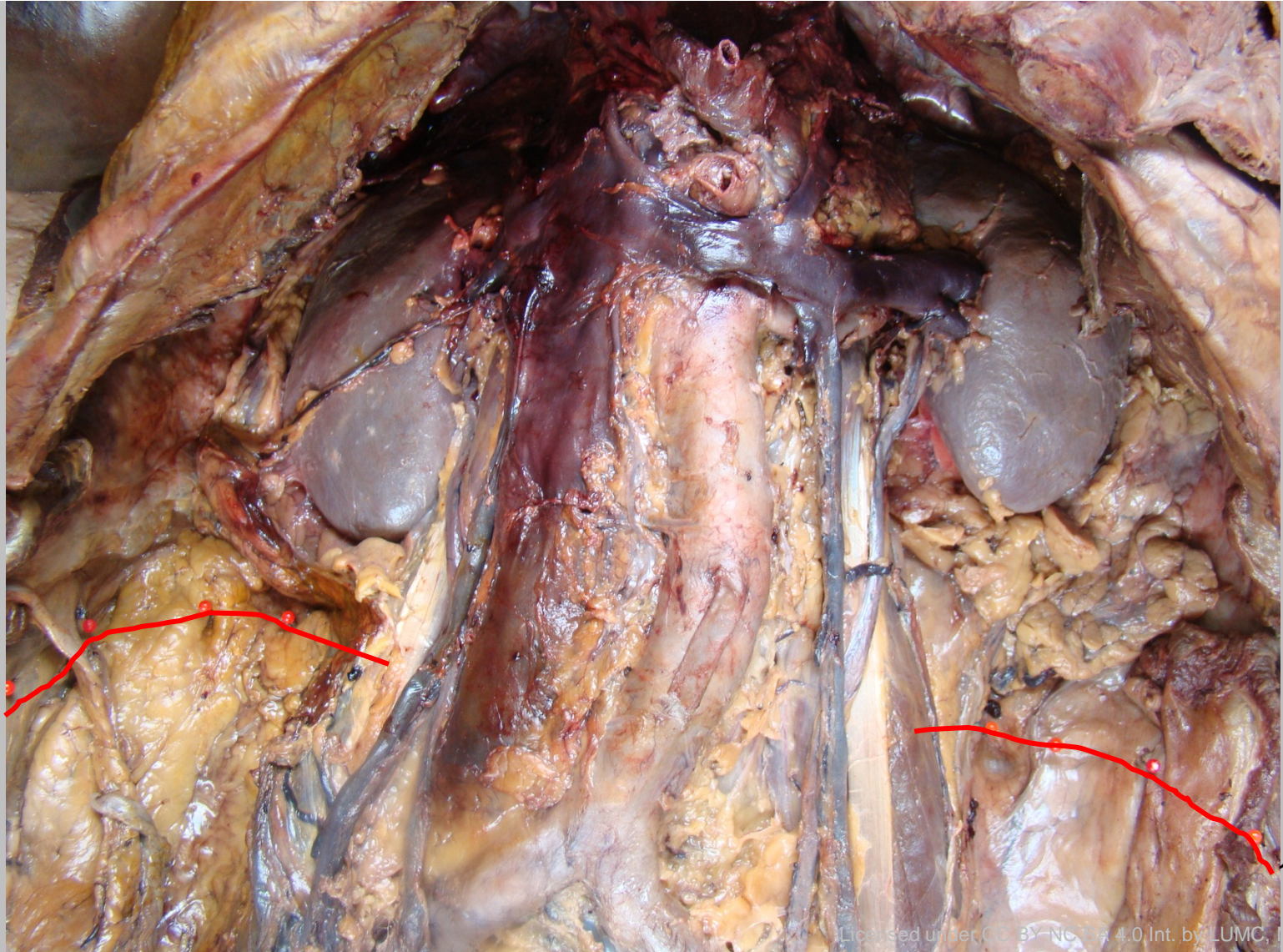
Internal iliac artery

Note: ureter crosses over iliac bifurcation



Kidneys

Lower border of the kidneys and iliac crests



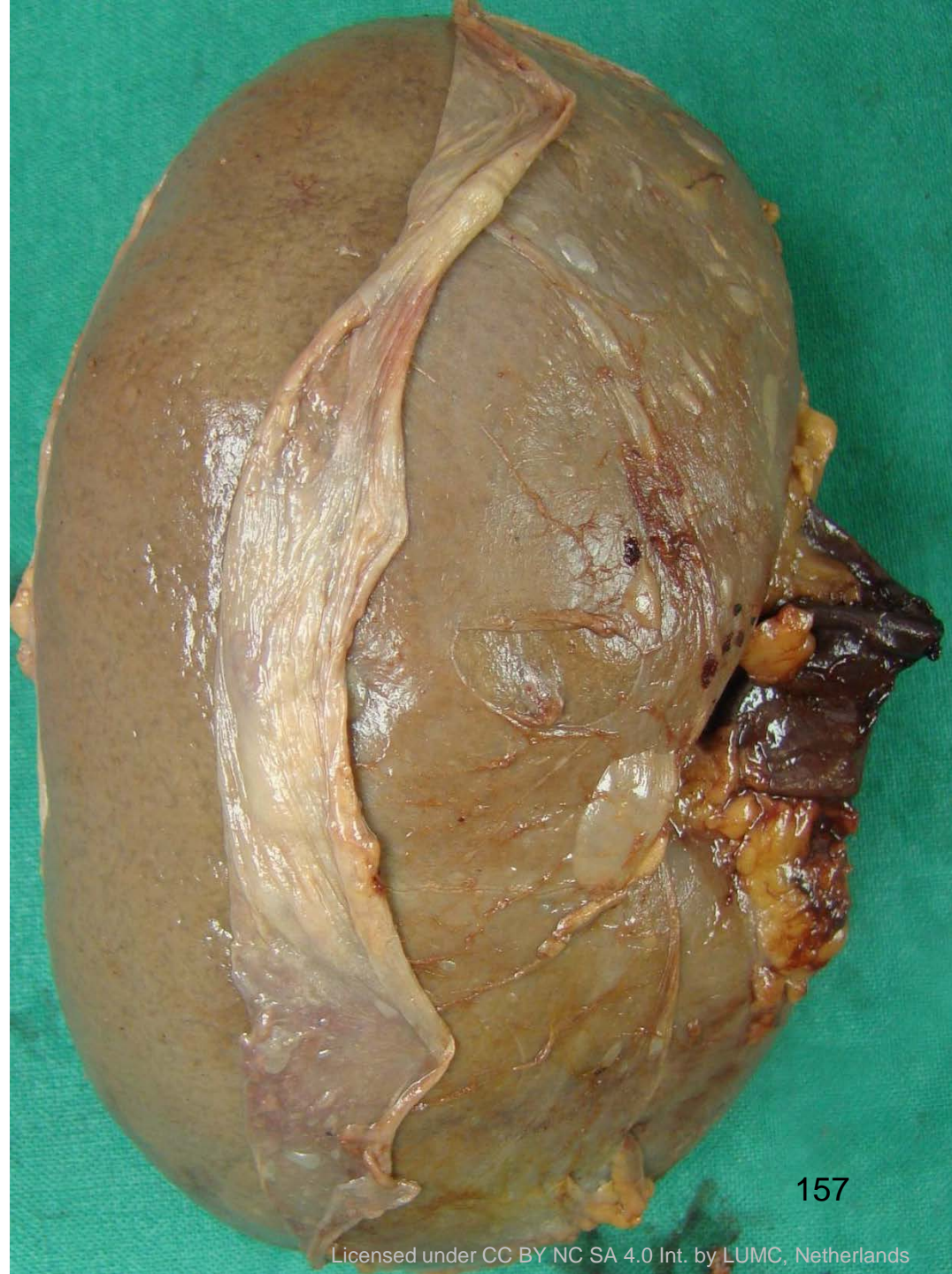
Anterior surface of the kidneys and suprarenal glands



Posterior surface of the kidneys and suprarenal glands



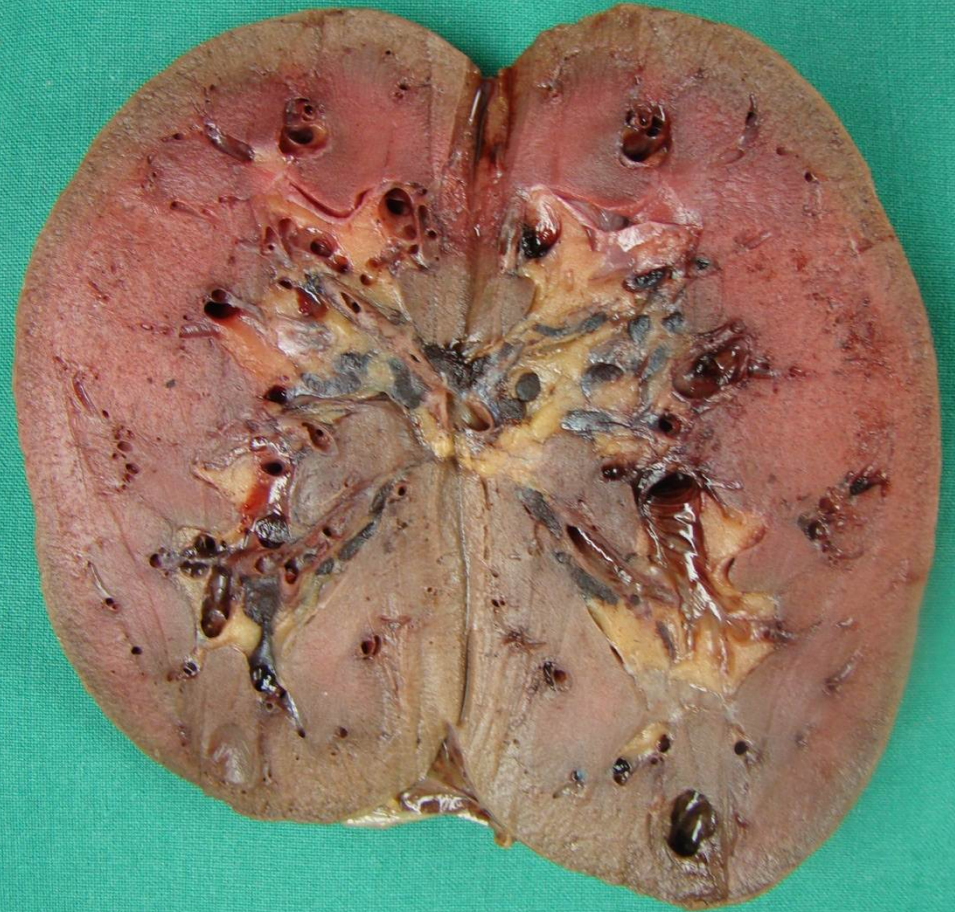
Fibrous capsule of the kidney



Fibrous capsule of the kidney



Kidney opened

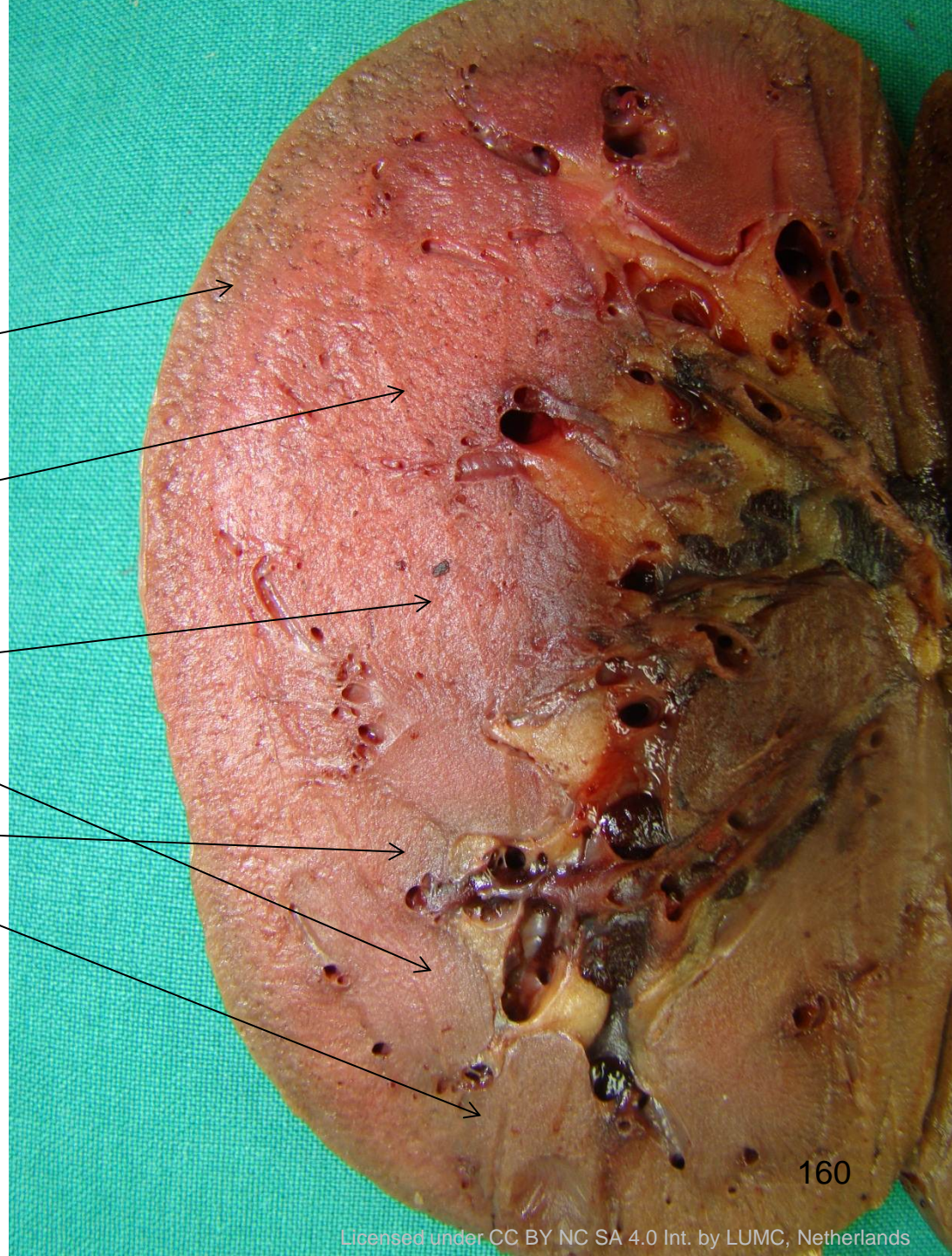


Renal cortex

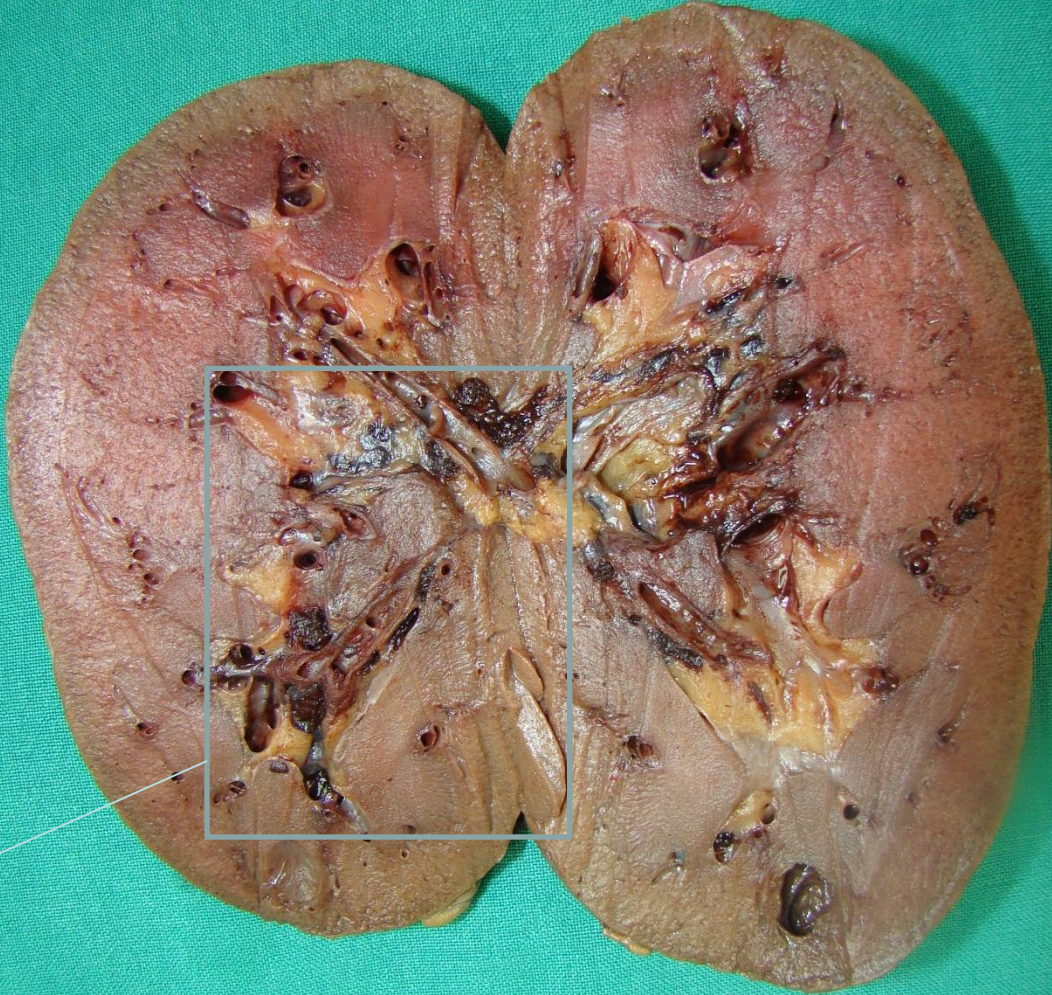
Renal medulla

Renal pyramid

Renal column



Minor calyx and Major calyx



Sympathetic trunk

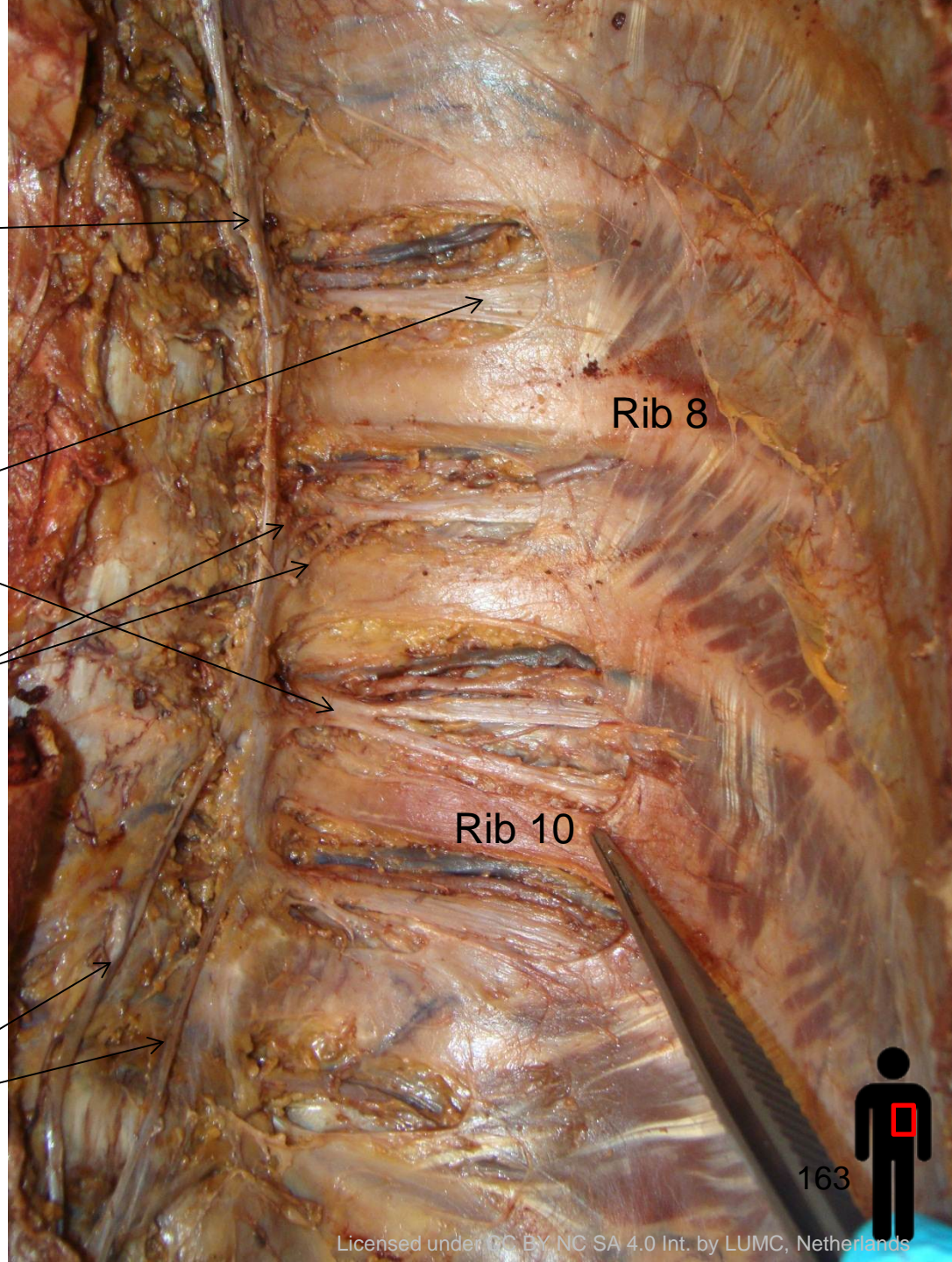
Thorax

Sympathetic trunk

Intercostal nerves

Gray and white ramus

Splanchnic nerves



Rib 8

Rib 10



Thorax

Sympathetic trunk

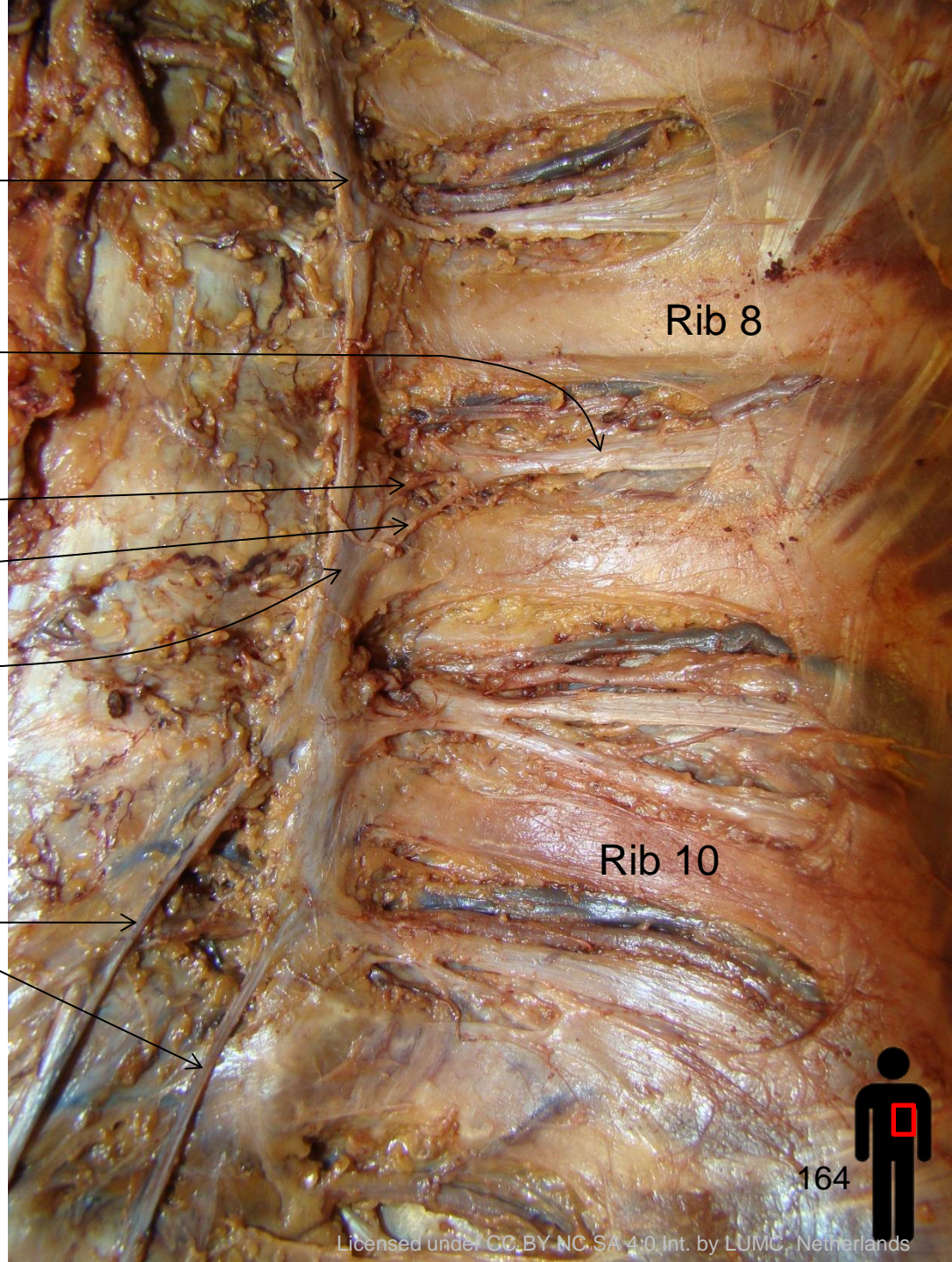
Intercostal nerve

Gray ramus

White ramus

Ganglion

(Thoracic) splanchnic nerves



Rib 8

Rib 10



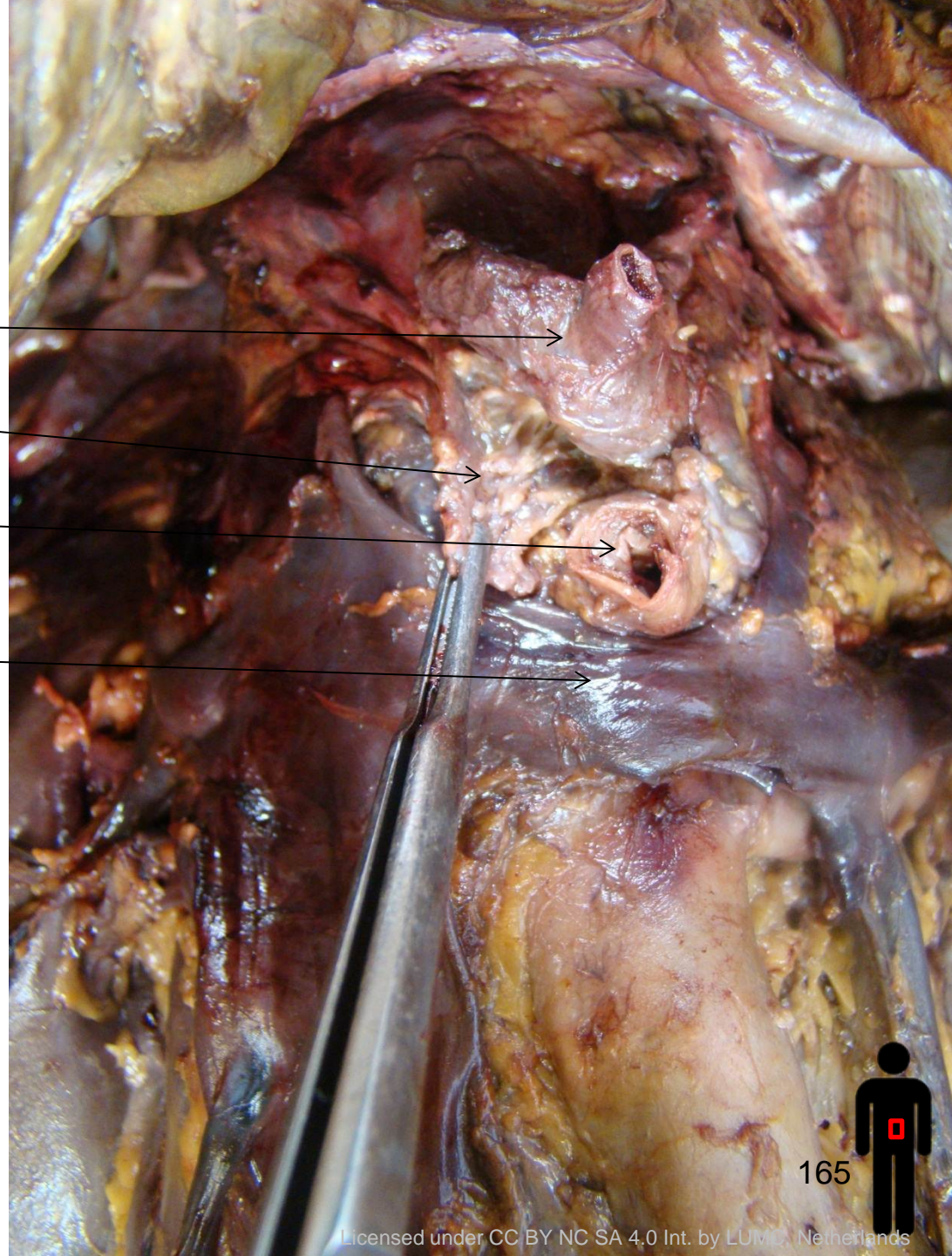
Abdomen

Celiac trunk

Preaortic plexus

Superior mesenteric
artery

Left renal vein

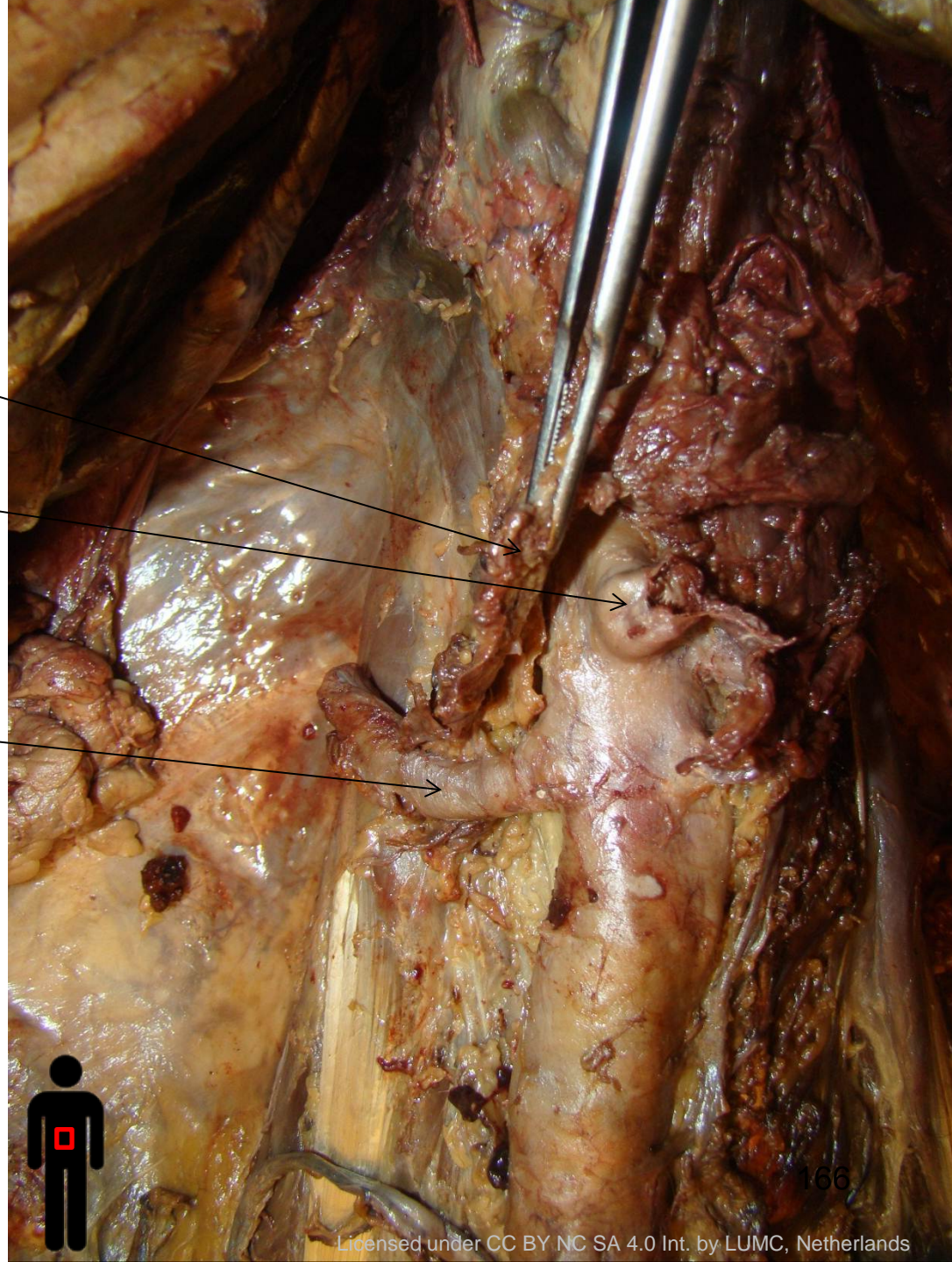


Abdomen

Pre aortic plexus

Superior mesenteric artery

Right renal artery



Lumbar plexus

Lumbar plexus (right):

Diaphragm

Quadratus lumborum m.

Subcostal nerve

Iliohypogastric nerve

Ilioinguinal nerve

Psoas major muscle

Sympathetic trunk

Genitofemoral nerve



Lumbar plexus (left):

Psoas muscle removed

Subcostal nerve

Iliohypogastric nerve

Ilioinguinal nerve

Psoas nerve

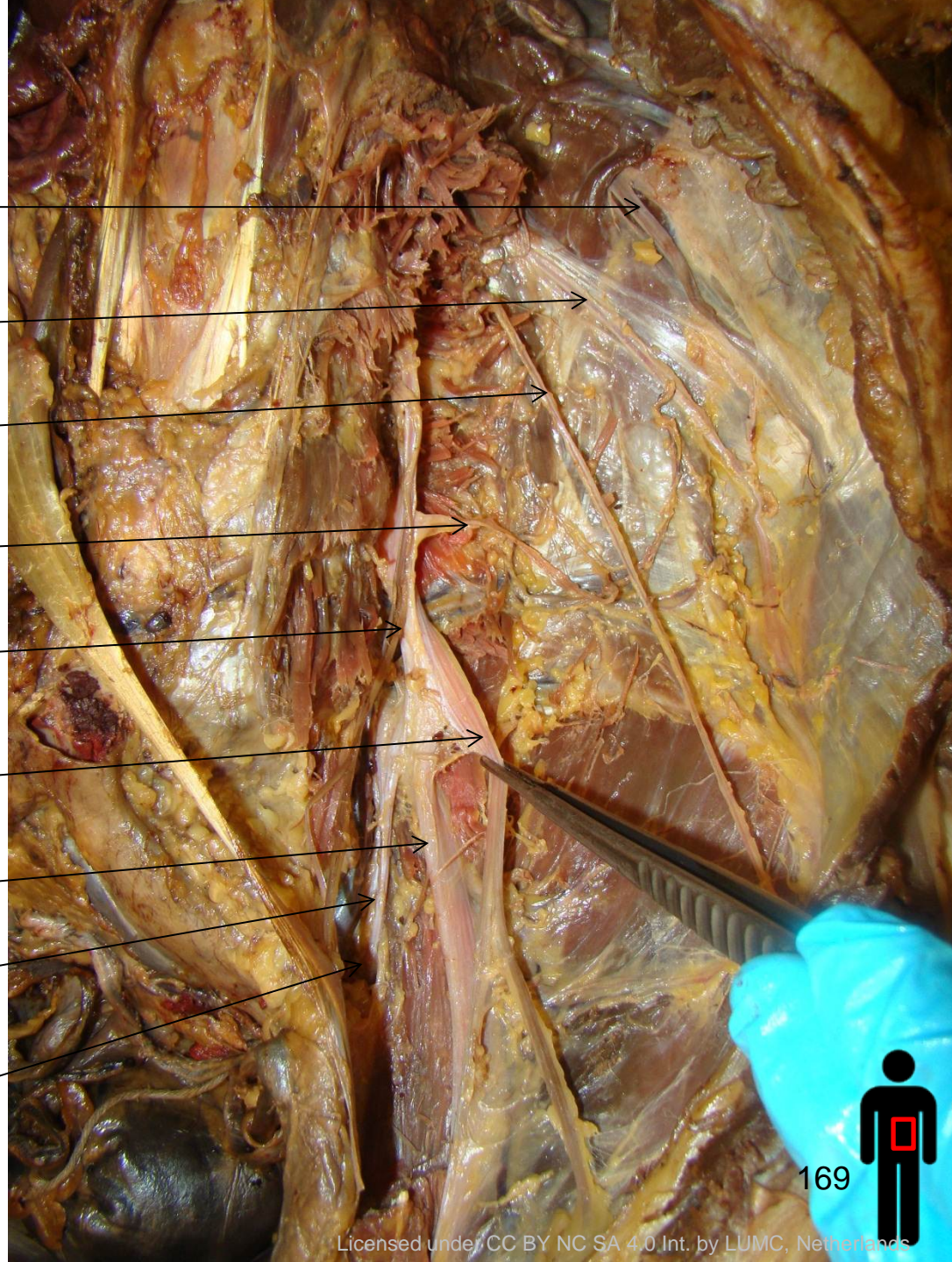
Genitofemoral nerve

Lat cutaneous N of thigh

Femoral nerve

Obturator nerve

Lumbosacral trunk



Right side

Splanchnic nerve

Psoas minor muscle

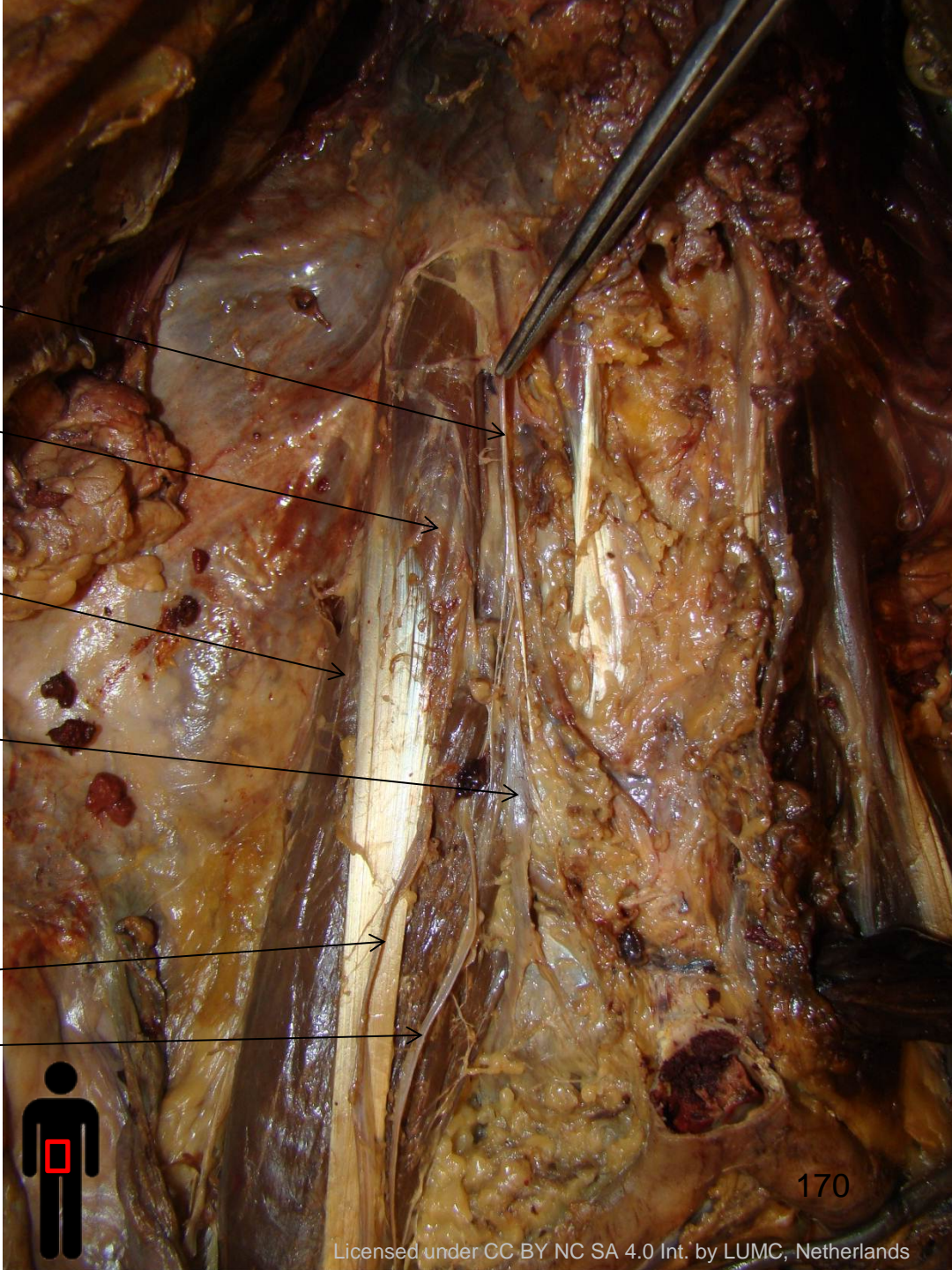
Psoas major muscle

Sympathetic trunk

Genitofemoral nerve:

femoral branch

genital branch



Left side

Sympathetic trunk

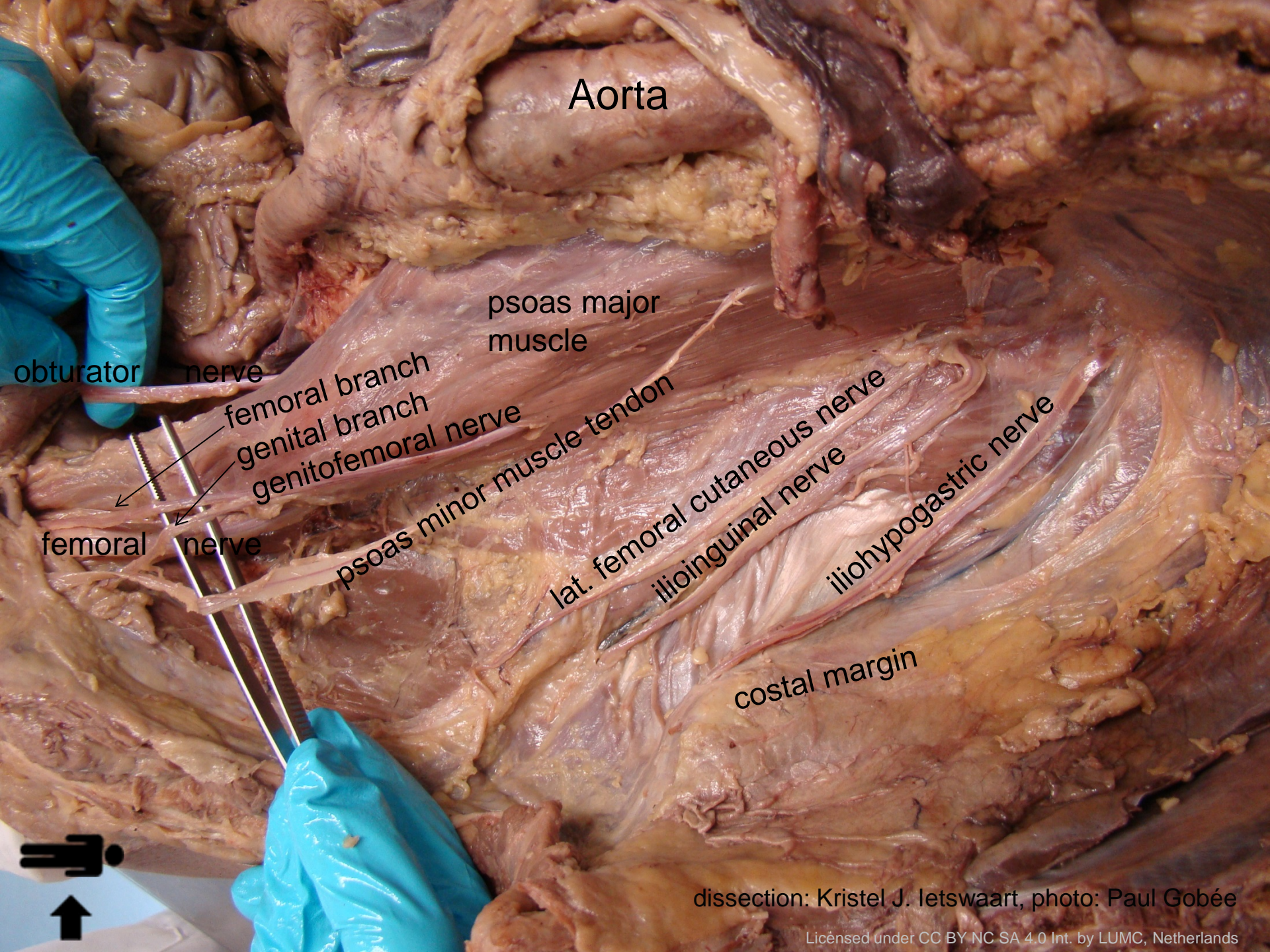
Genitofemoral nerve:

femoral branch

genital branch

Psoas major muscle





Aorta

psoas major muscle

obturator foramen

femoral branch
genital branch
genitofemoral nerve

psoas minor muscle tendon

femoral nerve

lat. femoral cutaneous nerve

ilioinguinal nerve

iliohypogastric nerve

costal margin



dissection: Kristel J. Ietswaart, photo: Paul Gobée

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We gratefully thank the people
who were willing to donate
their bodies for medical
teaching.

They enable us to see the
anatomy in reality.