

## AORTA THORACICA

It descends from the left side of T3 to T11-12 where passes through the hiatus aorticus. It is located first to the left from the vertebral column and caudally it is inserted between the oesophagus and the vertebral column.

Parietal branches are paired:

1. **Aa. intercostales post.** (9 pairs) – the 3rd to 11th intercostal spaces, sulcus costae, first between mm. intercostales externi and interni, then between mm. intercostales interni and intimi, anastomose with rr. intercostales anteriores from a. thoracica int. and a. musculophrenica, resp. The lowermost **a. subcostalis** runs below the 12th rib.

Branches:

- **r. dorsalis** – **rr. musculares** for muscles of the back
    - **r. spinalis**
    - **rr. cutanei med. et lat.** for the skin of the back
  - **rr. musculares** for thoracic muscles
  - **r. collateralis** arising at the angulus costae and running at the upper margin of the lower rib
  - **r. cutaneus lat.** for the skin of the thorax – **rr. mammarii lat.**
2. **A. phrenica sup.** - superior surface of the diaphragm

Visceral branches:

1. **Rr. bronchiales** - nutritive circulation of the lungs
2. **Rr. oesophagei** 6-9
3. **Rr. pericardiaci** for the posterior pericardial wall – **rr. mediastinales**

## AORTA ABDOMINALIS

From the diaphragm to L4 - bifurcatio aortae.

Parietal branches are paired:

1. **A. phrenica inf.** – inferior surface of the diaphragm. - **a. suprarenalis sup.**
2. **Aa. lumbales** – 4 paired branches that run laterally behind m. psoas major – **r. dorsalis** – **r. spinalis**

Paired visceral branches:

1. **A. suprarenalis media**
2. **A. renalis** - L1/L2
  - **r. uretericus**
  - **a. suprarenalis inf.**
  - **rr. praepelvici** - 4
  - **r. retropelvicus**

Aa. renales accessoriae often arise from the aorta or some other close artery (25%), they may enter the kidney at any site of the renal surface and may be the cause of complications during surgery of kidneys.

3. a) **A. testicularis** - L2, over the common or external iliac, inguinal - spermatic cord, supplies the testis and epididymis

-**rr. ureterici**,

3. b) **A. ovarica** - to the ovary through the lig. suspensorium ovarii, anastomoses with r. ovaricus a. uterinae.

- **rr. ureterici**

– **r. tubarius**

Unpaired visceral branches:

**1. Tr. coeliacus** -1-2cm, T12/L1

Branches:

**a) a. gastrica sin.** - along the lesser curvature of the stomach, anastomoses with a. gastrica dx. (from a. hepatica propria)– **rr. oesophagei**

**b) a. hepatica comm.** - behind the pylorus:

– **a. hepatica propria** - lig. hepatoduodenale - porta hepatis

– **a. gastrica dx.** - lesser curvature

- **r. dexter (a. cystica) et sinister**

- **a. gastroduodenalis** descends behind the pylorus

– **a. gastroepiploica dx.** along the greater curvature, anastomoses with a. gastroepiploica sin. (from a. lienalis)

- **a. pancreaticoduodenalis sup.** - between the head of the pancreas and the descending part of the duodenum, anastomoses with a. pancreaticoduodenalis inf. (from a. mesenterica sup.)

**c) a. lienalis** - along the upper margin of the pancreas

– **rr. pancreatici**

- **a. gastroepiploica sin.** – greater curvature of the stomach

- **aa. gastricae breves** - fundus ventriculi

- **rr. lienales**

(Accessory arteries of the liver: **a. hepatica accessoria dx.** (13%) usually from a. mesenterica sup., **a. hepatica accessoria sin.** (11%) – from a. gastrica sinistra.)

**2. A. mesenterica sup.** - L1, enters the mesentery - right iliac fossa, supplies the intestine from the caudal part of the duodenum to the left colic flexure.

– **a. pancreaticoduodenalis inf.**

- **aa. jejunales et ilei** (10 – 18) – 1-2 arcades at the jejunum (longer), 3-4 arcades at ileum (shorter).

- **a. ileocolica** – **r. ileus**

- **r. colicus**

- **r. appendicularis**

- **a. colica dx.** - ascending colon

- **a. colica media** – enters the transverse mesocolon, supplies the transverse colon

**3. A. mesenterica inf.** L2/3

– **a. colica sin.** - descending colon

- **aa. sigmoideae**

- **a. rectalis sup.** anastomoses with the sigmoidal arteries and a. rectalis media

Terminal branches:

**1. A. sacralis mediana** - the continuation of the aorta (in animals the artery of the tail),- arteriovenous anastomosis (**glomus coccygeum**)- **v. sacralis mediana**

– **a. lumbalis ima** laterally

- **rr. sacrales** anastomose with the lateral sacral arteries (a. iliaca int.)

**2. Aa. iliaca communis dx. et sin.** - bifurcatio aortae - to the articulatio sacroiliaca, the right artery is longer than the left one, the ureter and testicular (ovarian) vessels cross common iliac vessels anteriorly

- **a. iliaca interna**

- **a. iliaca externa**

### **A. ILIACA INTERNA**

It supplies the wall and organs of the small pelvis

#### Parietal branches:

1. **A. iliolumbalis** – **r. iliacus** - m. iliacus
  - **r. lumbalis** - m. psoas major and m. quadratus lumborum
  - **r. sacralis** -vertebral canal
2. **A. sacralis lat.** (2) medial to the foramina sacralia pelvina– **rr. spinales** - sacral canal
3. **A. obturatoria** - canalis obturatorius – **r. pubicus** anastomoses with r. pubicus from a. epigastrica inf. – **corona mortis**
  - **r. anterior** - adductors of the thigh
  - **r. posterior** – **r. acetabularis** alongside the lig. capitis femoris to the head of the femur (insufficient lumen in infants may result in constrained supply of the developing head of the femur and its disturbance).
4. **A. glutea sup.** - for. suprapiriforme
  - **r. spf.** – m. gluteus max. et med.
  - **r. prof.** – m. gluteus med. et min.
5. **A. glutea inf.** - for. infrapiriforme, supplies m. gluteus max.
  - **a. commitans n. ischiadici** supplies the sciatic nerve

#### Visceral branches:

1. **A. umbilicalis** - after birth mostly occluded - lig. umbilicale lat. patent to
  - **aa. vesicales sup.**
2. **A. vesicalis inf.** - lower part of the urinary bladder and the fornix vaginae in a female, seminal vesicles in a male
3. **A. rectalis media** - middle part of the rectum, anastomoses with the sup. and inf. rectal arteries
4. a) **A. uterina** - crosses the ureter (about 2 cm from the cervix and 1.5 cm above the vaginal fornix - the artery is anteriorly)
  - **r. uretericus**
  - **a. vaginalis ant. et post.**
  - **rr. uterini**
  - **r. tubarius**
  - **r. ovaricus**
4. b) **A. ductus deferentis**
  - **r. descendens** accompanies the ductus deferens to the scrotum, anastomoses with a. testicularis
  - **r. ascendens** - seminal vesicle – **r. uretericus** - terminal part of the ureter
5. **A. pudenda interna** - for. infrapiriforme - for. ischiadicum minus - fossa ischiorectalis canalis pudendalis (Alcock) - diaphragma urogenitale
  - **a. rectalis inf.** - canalis analis
  - **a. perinealis** – **rr. scrotales (labiales) post.**
  - a) **a. penis**
    - **a. bulbi penis**
    - **a. urethralis**
    - **a. profunda penis** - cavernous body – **aa. helicinae** open into cavernae
    - **a. dorsalis penis** - dorsal side of the penis
  - b) **a. clitoridis**
    - **a. bulbi vestibuli**

- **a. profunda clitoridis**
- **a. dorsalis clitoridis**

### **A. ILIACA EXTERNA**

- lacuna vasorum - **a. femoralis**

1. **A. epigastrica inf.** - lig. interfoveolare - m. rectus abdominis (plica umbilicalis lat.), anastomoses with a. epigastrica sup. from a. thoracica int.
  - **r. pubicus**, anastomoses with r. pubicus a. obturatoriae
  - **a) a. cremasterica** – male
  - **b) a. ligamenti teretis** - female
2. **A. circumflexa ilium prof.** to the spina iliaca ant. sup.

### **A. FEMORALIS**

trigonum femorale - canalis adductorius - hiatus tendineus - **a. poplitea**

1. **A. epigastrica spf.** anterior abdominal wall
2. **A. circumflexa ilium spf.** to the spina iliaca ant. sup.
3. **Aa. pudendae ext. – rr. scrotales (labiales) ant.**
4. **A profunda femoris** – fossa iliopectinea
  - **a. circumflexa femoris medialis** - posteriorly, anastomoses with the lateral artery
    - **r. spf.** - adductors
    - **r. prof.** - m. adductor magnus, flexors and hip joint
  - **a. circumflexa femoris lateralis**
    - **r. ascendens** anastomoses with the gluteal arteries and the medial circumflex a.
    - **r. descendens** to the knee joint
- **a. perforans prima** below the m. pectineus posteriorly – flexors
  - **a. nutritia femoris sup.**
- **a. perforans secunda** in the middle of the femur - flexors
- **a. perforans tertia** -terminal, 3 cm above the hiatus tendineus – flexors
  - **a. nutritia femoris inf.**
5. **Rr. musculares**
6. **A. genus descendens** - canalis adductorius, rete articulare genus
  - **r. saphenus**

### **A. POPLITEA**

fossa poplitea (deep to the vein and nerve)

1. **Aa. surales** - m. gastrocnemius
2. **A. genus sup. med. et lat.** - rete art. genus
3. **A. genus media** - knee joint
4. **A. genus inf med. et lat.** - rete art. genus
5. **A. tibialis ant.**
6. **A. tibialis post.**

### **A. TIBIALIS ANTERIOR**

membrana interossea cruris - between m. tibialis ant. and m. extensor dig. longus - between m. tibialis ant. and m. extensor hallucis longus - dorsum pedis - **a. dorsalis pedis**

1. **A. recurrens tibialis post.** - rete art. genus
2. **A. recurrens tibialis ant.** - rete art. genus

### 3. Rr. musculares

4. **A. malleolaris ant. med. et lat.** – rete melleolare med. et lat.

5. **A. dorsalis pedis** - dorsum penis - between tendons of m. extensor hallucis longus and m. extensor digitorum longus – a. metatarsea dorsalis prima and r. plantaris prof.

– **aa. tarseae med.** - medial margin of the foot

- **a. tarsea lat.** deep to m. extensor hallucis brevis and m. extensor digitorum brevis, anastomoses with a. arcuata

– **a. digitalis dorsalis V.**

- **a. arcuata** - laterally - with a. tarsea lat. forms the arch convex distally– **3 aa. metatarseae dorsales** each of them divides into 2 **aa. digitales dorsales**

- **a. metatarsea dorsalis prima** – **aa. digitales dorsales** for both sides of the big toe and the medial margin of the 2<sup>nd</sup> toe

- **r. plantaris prof.** - planta pedis, anastomoses with a. plantaris lat.

### A. TIBIALIS POSTERIOR

arcus tendineus m. solei - between superficial and deep crural flexors - behind the medial maleolus - planta pedis – **a. plantaris med. et lat.**

1. **R. circumflexus fibulae** - rete articulare genus

2. **A. peronea/fibularis** - paralel to a. tibialis post., canalis musculoperoneus/musculofibularis to the lateral maleolus

– **rr. musculares**

- **a. nutritia fibulae**

- **r. communicans** anastomoses with a. tibialis post.

- **r. perforans** - rete dorsale pedis

- **rr. malleolares lat.** - rete melleolare lat.

- **rr. calcanei lat.** - rete calcanei lat.

### 3. Rr. musculares

4. **A. nutritia tibiae**

5. **Rr. malleolares med.** - rete melleolare med.

6. **Rr. calcanei med.** - calcanei med.

7. **A. plantaris lat.** - between m. flexor dig. brevis and m. quadratus plantae - arcus plantaris with r. plantaris prof. from a. dorsalis pedis and with r. profundus from a. plantaris med.

Arcus plantaris: 4 **aa. metatarseae plantares** – **aa. digitales plantares**

- **rr. perforantes**

8. **A. plantaris med.** - between m. abductor hallucis and m. flexor digitorum brevis

- **r. profundus** supplies muscles of the medial side of the foot

- **r. superficialis** supplies the subcutaneous tissue of the medial side of the foot

**Rete articulare genus:** A. genus descendens (a. femoralis), a. genus sup. med. et lat., a. genus inf. med. et lat. (a. poplitea), a. tibialis recurrens post. et ant. (a. tibialis ant.), a. circumflexa fibulae (a. tibialis post.)

**Rete melleolare mediale:** A. malleolaris ant. med. (a. tibialis ant.), rr. malleolares med. (a. tibialis post.), aa. tarseae med. (a. dorsalis pedis)

**Rete melleolare laterale:** A. malleolaris ant. lat. (a. tibialis ant.), rr. malleolares lat. (a. peronea), branches from a. tarsalis lat. (a. dorsalis pedis)

**Rete calcaneum:** Rr. calcaneares med. (a. tibialis post.), rr. calcaneares lat. (a. peronea)

