

The arteries

The artery: the structure of the wall

Tunica intima

Tunica media

Tunica externa

The artery

The vein

- **the valves**

The Capillars

- the connection between the arteries and veins, the exchange of the substances between the blood and the tissues

The Aorta

Aorta ascendens: ventriculus sin. →

2nd art. sternocostalis dx.

- a. coronaria cordis dx. and sin.

Arcus aortae: 2nd art. sternocostalis

dx. → left side of Th₃

- truncus brachiocephalicus (a. carotis communis dx. a a. subclavia dx.)
- a. carotis communis sin.
- a. subclavia sin.

Lig. arteriosum

Aorta descendens: from Th3 – L4

Aorta thoracica

Aorta abdominalis (separated by the diaphragm)

The blood supply of the head and neck:

a. carotis communis: a. carotis interna a externa (the upper margin of the thyroid cartilage)

1) a. carotis externa

- **the anterior branches:**

- a. thyroidea sup. - for the thyroid gland

- a. lingualis – for the tongue

- a. facialis - regions of the face (the mimic muscles)

- **the lateral branches:**

- a. sternocleidomastoidea

- **the posterior branches:**

- a. occipitalis

- a. auricularis posterior

- **the medial branches:**

- a. pharyngea ascendens

- **the terminal branches:**

- a. temporalis superficialis

- a. maxillaris (the masticatory muscles)

2) a. carotis interna – through apertura externa canalis carotici into fossa cranii media, it supplies the anterior parts of the hemispheres, the eye socket and the inner ear

Aa. membri superioris

A. subclavia

- it lies on cupula pleurae, passes through fissura scalenorum, forms sulcus a. subclaviae on the 1st rib – from the lateral edge of the 1st rib, it changes its name into a. axillaris

The branches:

- 1) **a. vertebralis** (for the brain)
- 2) **truncus thyreocervicalis**: for the thyroid gland (a. thyroidea inferior), to the muscles of scapula (a. suprascapularis) and the neck (a. cervicalis ascendens, a. cervicalis superficialis)
- 3) **truncus costocervicalis** for the deep neck muscles (a. cervicalis profunda) and the first two intercostal spaces (a. intercostalis suprema)
- 4) **a. thoracica interna** for m. rectus abdominis (a. epigastrica superior) and the diaphragm (a. musculophrenica)
- 5) **a. transversa colli** (the nuchal muscles, the muscles of the girdle of UE, m. trapezius)

A. axillaris – from the 1st rib till the lower edge of the tendon of m. pectoralis major

- 1) **The muscular branches** (m. subscapularis)
- 2) **a. thoracica suprema** (first two intercostal spaces)
- 3) **a. thoracoacromialis** (the shoulder joint, m. deltoideus, mm. pectorales)
- 4) **a. thoracica lateralis** (m. serratus anterior)
- 5) **a. subscapularis** (a. circumflexa scapulae, a. thoracodorsalis for m. latissimus dorsi)
- 6) **a. circumflexa humeri anterior**
- 7) **a. circumflexa humeri posterior** (through foramen humerotricipitale into m. deltoideus)

The anastomosis of a. suprascapularis and a. circumflexa scapulae

The anastomosis of a. circumflexa humeri anterior and posterior

Foramen humerotricipitale:

**n. axillaris,
a. circumflexa
humeri posterior**

Foramen omotricipitale:

**a. circumflexa scapulae -
the anastomosis with a.
suprascapularis**

A. brachialis

- from the edge of m. pectoralis major, inside sulcus bicipitalis medialis, inside fossa cubiti it divides into: a. radialis and a. ulnaris

The branches:

- 1) **a. profunda brachii** (inside sulcus n. radialis)
- 2) **a. collateralis ulnaris superior** (behind med. epicondyle, into the arterial net around the elbow joint)
- 3) **a. collateralis ulnaris inferior** (into the arterial net around the elbow joint)

The terminal branches:

- 4) **a. radialis and a. ulnaris**

A. radialis

- below m. brachioradialis, into foveola radialis, below the tendon of m. extensor pollicis longus, it runs onto the back of the hand, gets through m. interosseus dorsalis I. and in the palm it gives its terminal branches:

arcus palmaris profundus

a. princeps pollicis

The branches :

a) the branches for the elbow joint

b) the muscular branches (radial and palmar group)

c) The branches to rete carpi palmare → aa. metacarpeae dorsales → aa. digitales dorsales)

d) r. palmaris superficialis et profundus – help create arcus palmaris superficialis et profundus

e) a. princeps pollicis - for the thumb and lateral edge of the index

A. ulnaris

between m. flexor digitorum profundus and superficialis

Distally between m. flexor carpi ulnaris and m. flexor digitorum superficialis

Into the palm on the surface of retinaculum flexorum, along the radial side of os pisiforme and divides into the terminal branches:

r. palmaris superficialis

r. palmaris profundus

The branches:

- a) the muscular branches**
- b) a. interossea communis**
- c) for art. radiocarpalis**
- d) r. palmaris superficialis**
- e) r. palmaris profundus**

ARCUS PALMARIS SUPERFICIALIS

- aa. digitales palmares communes → aa. digitales palmares propriae**

ARCUS PALMARIS PROFUNDUS

- aa. metacarpae palmares – connect with aa. digitales communes**

RETE ARTICULARE CUBITI

RETE CARPI PALMARE

RETE CARPI DORSALE

Aorta descendens

Th3- L4

**AORTA THORACICA –
from Th₃ till the diaphragm
(posterior mediastinum)**

The parietal branches:

aa. intercostales

**posteriores (intercostal
spaces)**

**aa. phrenicae superiores
(the diaphragm)**

The visceral branches:

rr. bronchiales

rr. oesophagei

rr. pericardiaci

rr. mediastinales

AORTA ABDOMINALIS – the diaphragm - L4

- retroperitoneally
- L4 - bifurcatio aortae

The parietal branches:

- For the abdominal wall, for the diaphragm (aa. phrenicae inferiores, aa. lumbales)

The visceral branches:

- **the non-paired branches**

1) truncus coeliacus (Th₁₂-L₁) -
(for the stomach, liver, spleen)

2) a. mesenterica superior (L₁)
(for the whole small intestine
and a part of the large
intestine)

3) a. mesenterica inferior (L₃)
(from flexura coli sin.
downward till the cranial part
of the rectum)

truncus coeliacus

a. mesenterica superior

a. mesenterica inferior

- **Truncus coeliacus:**
- A. gastrica sinistra
- A. hepatica communis
- A. lienalis

- A. mesenterica superior:
- A. pancreaticoduodenalis
- Aa. jejunales et ilei
- A. ileocolica
- A. colica dextra
- A. colica media

- **A. mesenterica inferior:**
- A. colica sinistra
- Aa. sigmoideae
- A. rectalis superior

- **the paired branches:**

- 1) **for the suprarenal glands-**

- aa. suprarenales mediae

- 2) **for the kidneys**

- aa. renales

- 3) **for the ovaries(testicles)**

- aa. testiculares

- aa. ovaricae

- **the terminal branches:**

- **a. sacralis mediana**

- **aa. iliacae communes**

Aa. iliacae communes

- L₄ bifurcatio aortae
- art. iliaca communis (divides into a. iliaca int. a ext.)

A. iliaca interna

– it supplies the organs and the wall of the small pelvis

The parietal branches:

- The muscular branches for the gluteal muscles (a. glutea superior et inferior), the wall of the small pelvis (a. iliolumbalis, a. sacralis lateralis), for the adductors of the thigh (a. obturatoria), for the genital organs (a. pudenda interna)

The visceral branches:

- a. umbilicalis (obliterates and changes into lig. umbilicale lat.)
- for the urinary bladder (a. vesicalis inf.)
- for ductus deferens (resp. For the uterus) – a. ductus deferentis, a. uterina

The parietal branches:

The visceral branches:

A. iliaca externa

- **thicker**
- a. **epigastrica inferior (the abdominal muscles, the wall of the large pelvis)**
- a. **circumflexa ilium profunda**

Aa. membri inferioris

A. femoralis

- from lacuna vasorum till fossa poplitea, through fossa iliopectinea and canalis adductorius

The branches:

- 1) For the external genital organs and the abdominal wall: a. epigastrica superficialis, a. circumflexa ilium superficialis, aa. pudendae externae
- 2) a. profunda femoris: the main artery for the muscles of the thigh (a. circumflexa femoris med. a lat., aa. perforantes)
- 3) the muscular branches (thigh)
- 4) a. genus descendens: for rete articulare genus

} **aa. perforantes**

A. poplitea

- from hiatus tendineus till the distal edge of m. popliteus
- for the muscles of fossa poplitea and the knee joint

The branches:

- 1) **aa. surales** (for m. gastrocnemius)
- 2) **aa. genus** – into the arterial net around the knee joint
- 3) the terminal branches:
 - a. tibialis anterior**
 - a. tibialis posterior**

A. tibialis anterior

- It perforates through membrana interossea cruris
- proximally between m. tibialis ant. and m. extensor digitorum longus
- distally between m. tibialis ant. and m. extensor hallucis longus – under retinaculum extensorum
- From the passing under retinaculum extensorum – it is called – **a. dorsalis pedis**

m. extensor digitorum longus

m. tibialis ant.

m. extensor hallucis longus

- **It supplies the knee joint, the anterior side of the lower leg, the back of the foot and the fingers**

The branches:

- 1) into arterial net around the knee joint**
- 2) The muscular branches**
- 3) into arterial net around both ankles**
- 4) a. dorsalis pedis**

The branches of a. dorsalis
pedis:

a. tarsalis lateralis

aa. tarsales mediales

a. arcuata

- aa. metatarseae dorsales
- aa. digitales dorsales

a. metatarsea dorsalis I.

r. plantaris profundus (into
planta pedis-arcus plantaris)

a. dorsalis pedis

a. arcuata

a. metatarsea
dorsalis I.

A. tibialis posterior

- under arcus tendineus m. solei, it lies onto the deep flexors of the lower leg, behind the medial ankle runs into planta pedis
- **canalis malleolaris** (the structures behind the medial ankle)
 - m. tibialis posterior
 - m. flexor digitorum longus
 - a. et vv. tibiales posteriores
 - n. tibialis
 - m. flexor hallucis longus

the branches:

- 1) into the arterial net around the knee joint**
- 2) a. peronea (fibularis)- supplies fibula and surrounding muscles**
- 4) into the arterial net around the medial ankle**
- 5) into the arterial net around the heel**

the terminal branches:

a. plantaris medialis

**a. plantaris lateralis (arcus plantaris –
aa. metatarsae plantares
aa. digitales plantares)**

RETE ARTICULARE GENUS (rete patellae)

RETE MALLEOLARE MEDIALE

RETE MALLEOLARE LATERALE

RETE CALCANEUM

RETE DORSALE PEDIS

- **Pictures:**
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- **Naňka, Elišková: Přehled anatomie. Galén, Praha 2009.**
- **Čihák: Anatomie I, II, III.**
- **Drake et al.: Gray's Anatomy for Students. 2010**