

## Guidelines

<i>Academic discipline</i>	HUMAN ANATOMY
<i>Module №</i>	2
<i>Content module №</i>	15
<i>Topic of the lesson</i>	Aorta. External carotid artery.
<i>Course</i>	1
<i>The number of hours</i>	3

## **1. The relevance of the topic**

Common carotid artery is often used for measuring heart rate, particularly in those patients whose heart rate in peripheral arteries are not determining. External carotid artery supplies the organs of the head and neck, where it gives a large number of branches. Examination of the carotid arteries is very important in medicine, particularly in the diagnosis of emergency conditions, monitor the patient during surgery, etc. the nature of the pulsating artery indicates the condition of Central hemodynamics, blood pressure, heart rate, level of heart rate.

## **2. Specific objectives**

1. Know and be able to demonstrate parts of aorta and branches of aortic arch.
2. Determine and demonstrate, where do left and right common carotid arteries starts and know differences in their structure.
3. Determine and demonstrate the area of branching of the common carotid artery to its terminal branches.
4. Determine and demonstrate three groups of branches of the external carotid artery.
5. Name and demonstrate organs and groups of organs, which receive blood from the external carotid artery.

**3. Basic level of student's knowledge** include main knowledge of medical biology and anatomy of the chest, internal organs, muscles of the neck, organs of head, neck and thoracic cavity.

## **4. Task for independent during preparation to practical classes**

### **4.1. Theoretical questions for the lesson:**

1. Where do left and right common carotid arteries starts?
2. At what level and in which branches common carotid artery divides?
3. Name arteries, which carry blood to sternocleidomastoid muscle.
4. Name arteries, which carry blood to large mouth (salivary) glands.
5. Name branches of maxillary artery, which situated nearly to the collum of the mandible.
6. Name branches of third (terminal) group of the maxillary artery.
7. Name branches of the external carotid artery, which carries blood to the tympanic cavity.

8. Name branches of the external carotid artery, which carries blood to the dura mater encephali.
9. Name muscles of the neck, which receive blood from superior thyroid artery.
10. Name glands, which receive blood from lingual artery.

#### 4.2. The list of practical skills:

- Aortic arch
- Common carotid artery
- The bifurcation of the common carotid artery
- External carotid artery.
- Superior thyroid artery
- Lingual artery
- Facial artery
- Occipital artery
- Posterior auricular artery
- The ascending pharyngeal artery
- Superficial temporal artery
- Maxillary artery

#### The content of the topic

The aorta is the largest artery in the body, initially being an inch wide in diameter. It receives the cardiac output from the left ventricle and supplies the body with oxygenated blood via the systemic circulation.

The aorta can be divided into four sections: the **ascending aorta**, the **aortic arch**, the **thoracic (descending) aorta** and the **abdominal aorta**. It terminates at the level of L4 by bifurcating into the left and right common iliac arteries.

The ascending aorta arises from the **aortic orifice** from the left ventricle and ascends to become the aortic arch. It is 2 inches long in length and travels with the pulmonary trunk in the pericardial sheath.

#### Branches

The left and right aortic sinuses are dilations in the ascending aorta, located at the level of the aortic valve. They give rise to the **left and right coronary arteries** that supply the myocardium.

#### **Aortic Arch**

The aortic arch is a continuation of the ascending aorta and begins at the level of the second sternocostal joint. It arches superiorly, posteriorly and to the left before moving inferiorly.

The aortic arch ends at the level of the T4 vertebra. The arch is still connected to the pulmonary trunk by the **ligamentum arteriosum** (remnant of the foetal ductus arteriosus).

#### Branches

There are three major branches arising from the aortic arch. Proximal to distal:

- **Brachiocephalic trunk:** The first and largest branch that ascends laterally to split into the right common carotid and right subclavian arteries. These arteries supply the right side of the head and neck, and the right upper limb.
  - **Left common carotid artery:** Supplies the left side of the head and neck.
- Left subclavian artery:** Supplies the left upper limb.

The **right common** carotid artery arises from a **bifurcation** of the **brachiocephalic trunk** (the right subclavian artery is the other branch). This bifurcation occurs roughly at the level of the right sternoclavicular joint.

The left common carotid artery branches directly from the **arch of aorta**. The left and right common carotid arteries ascend up the neck, **lateral** to the trachea and the oesophagus. They do not give off any branches in the neck.

At the level of the superior margin of the **thyroid cartilage (C4)**, the carotid arteries split into the **external** and **internal** carotid arteries. This bifurcation occurs in an anatomical area known as the carotid triangle.

The common carotid and internal carotid are slightly dilated here, this area is known as the **carotid sinus**, and is important in detecting and regulating blood pressure.

### **External Carotid Artery**

The external carotid artery supplies the areas of the head and neck external to the cranium. After arising from the **common carotid** artery, it travels up the neck, posterior to the mandibular neck and anterior to the lobule of the ear. The artery ends within the parotid gland, by dividing into the **superficial temporal** artery and the **maxillary** artery. Before terminating, the external carotid artery gives off six branches:

- Superior thyroid artery
- Lingual artery
- Facial artery
- Ascending pharyngeal artery
- Occipital artery
- Posterior auricular artery

The facial, maxillary and superficial temporal arteries are the major branches of note. The maxillary artery supplies the **deep** structures of the face, while the facial and superficial temporal arteries generally supply superficial areas of the face.

## Tests

1. During a crash the child's broken glass split the superficial temporal artery. The father of the child clearly complied with the rules of first aid for temporarily stop the bleeding, pressing vessel to the zygomatic arch 1 cm ahead the ear. A branch of what vessel is crossed superficial temporal artery?
  - A. A. palatina ascendens.
  - B. A. sphenopalatina.
  - C. A. carotis externa.
  - D. A. facialis.
  - E. A. maxillaris.
2. As a result of fighting a man, 25 years old, received knife wound of a neck with damage to the outer carotid artery. To temporarily stop the bleeding effective method is the finger pressure the common carotid artery to the transverse process of the VI cervical vertebra. In what triangle of the neck to carry out the compression of the carotid artery for stop bleeding?
  - A. The carotid triangle.
  - B. Triangularis inframandubulares.
  - C. Triangle of Pirogov.
  - D. Triangularis scapulothoracalis.
  - E. Triangularis scapuloclavicularis.
3. What artery can be damaged when performing conduction anesthesia in the area of the openings of the lower jaw?
  - A. a. lingualis.
  - B. a. buccalis.
  - C. a. alveolaris inferior.
  - D. rr sphenoidales.
  - E. a. meningea media.
4. Patient, 43 years old, appealed with complaints a tumor-like protrusion on the tongue. The surgeon was diagnosed with a malignant tumor. Planning the operation, he decided to ligate the artery that is in the triangle of Pirogov. What?
  - A. R. suprahyoideus.
  - B. A. sublingualis.
  - C. A. profunda linguae.
  - D. A. lingualis.
  - E. A. palatina ascendens.
5. The patient 24 years of age, went to the doctor with a complaint for swelling and pain under the lower jaw on the right. The surgeon found stone in paniniwalang gland. Removing it he prevented bleeding from the artery:

A. A. lingualis.

B. A. palatina ascendens.

C. A. alveolaris inferior.

D. A. labialis inferior.

E. A. facialis.

6. Patient 20 years deep tamponade of the nasal cavity in connection with profuse nasal bleeding. Damage what artery caused bleeding?

A. A. palatina major.

B. Aa. palatinae minores.

C. A. sphenopalatina.

D. A. palatina ascendens.

E. A. pharyngea ascendens.

7. The patient, 40 years, as a result of stab injured neck started bleeding from the General the carotid artery, which runs in the carotid the triangle composed of the neurovascular bundle of the neck. What are the elements that form the beam?

A. A. carotis communis, v. jugularis interna, n. hypoglossus.

B. N. vagus, a. carotis communis, v. jugularis interna.

C. V. jugularis externa, a. carotis communis, n. hypoglossus.

D. V. jugularis externa, a. carotis communis, n. phrenicus.

E. V. jugularis anterior, a. carotis communis, n. vagus.

8. Patient 60 years old, fell and sustained a head injury and was taken to the hospital. The examination revealed a subcutaneous hematoma of the temporal area. Damage to which artery led to the appearance of a hematoma?

A. A. buccalis.

B. A. maxillaris.

C. A. auricularis posterior.

D. A. temporalis superficialis.

E. A. occipitalis.

9. Patient 19 years old, plan on removing of the tonsils. Damage to which artery topographically connected with the Palatine tonsils, can cause complications arterial bleeding?

A. A. facialis.

B. A. buccalis.

C. A. lingualis.

D. A. maxillaries.

E. A. alveolaris inferior.

10. Patient 30 years with incised wound of cheek and hemorrhage was taken to hospital. When examination revealed damage chewing muscles. Branches of what artery supplying the chewing muscle?

- A. A.occipitalis.
- B. A.temporalis superficialis.
- C. A.auricularis posterior.
- D. A.buccalis.
- E. A.maxillaris.