

GUIDELINES

Students' independent work during preparation to practical lesson

Academic discipline	HUMAN ANATOMY
Topic	AORTA. THORACIC AORTA.

1. The relevance of the topic

Aorta is the biggest vessel of the systemic blood circulation. All the arteries that form systemic blood circulation branch out of it. Because of the daily loads a great number of diseases can develop in this vessel so the knowledge of anatomical features of the aorta is necessary for diagnosing and right choice of treatment of different pathologies such as:

- Thoracic aortic aneurism (weakened area in the upper part of the aorta; the relevant problem of the vascular surgery and anaesthesiology with the lethality from the aneurism rupture is between 70 and 90%).
- Atherosclerosis (deposits of fat on the inner surface of the vessels).
- Aortic coarctation (congenital abnormality, when aorta is narrow).

2. Specific objectives:

- demonstrate on the preparation and describe the parts of aorta;
- describe systemic and pulmonary blood circulations;
- describe sections and branches of aorta, show them on preparation;
- know the variants of ramification of aorta;
- classify the branches of thoracic aorta;
- describe and demonstrate visceral branches of thoracic aorta (bronchial, oesophageal, mediastinal) on the preparation;
- describe and demonstrate parietal branches of thoracic aorta (upper diaphragmatic, intercostal arteries) on the preparation.

3. The list of practical skills:

- Aorta
- Ascending part of aorta
- Aortic arch
- Brachiocephalic trunk
- Left and right subclavian arteries
- Left and right common carotid arteries
- Descending part of aorta
- Thoracic part of aorta
- Abdominal part of aorta
- Visceral branches (bronchial, oesophageal, mediastinal)
- Parietal branches (upper diaphragmatic, intercostal arteries)

4. Task for independent work during preparation to practical classes

4.1. A list of the main terms, parameters, characteristics that need to be learned by student during the preparation for the lesson.

Term	Definition
THORACIC AORTA	The thoracic descending aorta gives rise to the intercostal and subcostal arteries, as well as to the superior and inferior left bronchial arteries and branches to the esophagus, mediastinum, and pericardium. Its lowest pair of branches are the superior phrenic arteries, which supply the diaphragm, and the subcostal arteries for the twelfth rib.

BRONCHIAL ARTERIES	Supply the lungs. Although there can be variations, there are usually two bronchial arteries that run to the left lung, and one to the right lung.
MEDIASTINAL BRANCHES	The mediastinal branches are numerous small vessels which supply the lymph glands and loose areolar tissue in the posterior mediastinum.
ESOPHAGEAL ARTERIES	The esophageal arteries four or five in number, arise from the anterior surface of the aorta, and pass obliquely downward to the esophagus, forming a chain of anastomoses along that tube, anastomosing with the esophageal branches of the inferior thyroid arteries above, and with ascending branches from the left inferior phrenic and left gastric arteries below. These arteries supply the middle third of the esophagus.
SUPERIOR PHRENIC ARTERIES	The superior phrenic arteries are small and arise from the lower part of the thoracic aorta; they are distributed to the posterior part of the upper surface of the diaphragm, and anastomose with the musculophrenic and pericardiophrenic arteries.
POSTERIOR INTERCOSTAL ARTERIES	The posterior intercostal arteries are branches that originate along the posterior aspect of the descending thoracic aorta.

5. Sources:

Anatomy nomenclature international	http://anatom.ua/anatomical-terminology/
LECTURE	https://anatom.ua/basis/english/lectures/
Textbook 'Human anatomy'	PP. 292-301 http://anatom.ua/basis/english/online-book-in-english/
Work Book (Coloring book)	PP. 103-104
Atlas of human anatomy (Sobotta)	PP. 104, 112-114, 125-129
QUIZES	https://anatom.ua/basis/english/tests/
VIDEO	https://anatom.ua/basis/video/

6. Materials for self-control

1. What vessels do belong to the rami viscerales of the thoracic aorta?
 - A. Aa. intercostales posteriors III-XI, rami oesophagei, rami pericardiaci
 - B. Aa. intercostales posteriors I-XI, rami oesophagei, rami pericardiaci
 - C. Rami bronchiales, rami oesophagei, rami mediastinales, rami pericardiaci
 - D. Rami oesophagei, rami pericardiaci
 - E. Rami mediastinales, rami pericardiaci

2. Aortal valve that is located between left ventricle and ascending aorta has _____ cusps
 - A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. 5

3. Branches of what arteries form anastomosis with the oesophageal branches (rami oesophagei)?
 - A. Inferior thyroid artery
 - B. Superior thyroid artery
 - C. Left gastric artery
 - D. Inferior thyroid artery and left gastric artery
 - E. Superior thyroid artery and left gastric artery

4. What arteries provide blood supply of spatia intercostales I et II?
 - A. A.a. intercostales anteriores, a. thoracoacromialis
 - B. A. intercostales posteriores, a. colli ascendens
 - C. A.a. intercostalis suprema, a.a. intercostales anteriores, a. thoracica superior
 - D. A.a. intercostales anteriores, a. colli ascendens
 - E. A. thoracica interna, a. colli ascendens

5. What branches of the thoracic aorta supply the lung as an organ?
 - A. Rami bronchiales
 - B. Rami oesophagei
 - C. Rami mediastinales
 - D. Rami pericardiaci
 - E. Aa. intercostales posteriors III-XI

6. Choose rami parietales of the thoracic aorta.
 - A. Aa. intercostales posteriors III-XI, aa. phrenicae superiores, aa. subcostales
 - B. Aa. phrenicae superiores, aa. thoracica interna
 - C. Rami mediastinales, rami pericardiaci, aa. intercostales posteriors III-XI, aa. phrenicae superiores
 - D. Rami mediastinales, aa. intercostales posteriors III-XI, aa. phrenicae superiores, aa. subcostales
 - E. Rami bronchiales, rami oesophagei, rami mediastinales, rami pericardiaci

7. What artery passes along the costal sulcus?
 - A. Dorsal branch of posterior intercostal artery
 - B. Intercostal artery proper
 - C. Posterior intercostal artery
 - D. Superior phrenic artery
 - E. Internal thoracic artery

8. What types of branches does aorta has?

- A. Parietal and intercostal
- B. Intercostal and parietal
- C. Intercostal and thoracic
- D. Parietal and visceral
- E. Visceral and subcostal

9. What arteries branch from the aa. intercostales posteriors III-XI of the thoracic aorta?

- A. Aa. phrenicae superiores
- B. Aa. thoracica interna
- C. Aa. intercostales posteriors I-XI
- D. Rami mediastinales
- E. Rami dorsalis

10. Where do I and II posterior intercostal arteries arise?

- A. Posterior intercostal artery
- B. Anterior intercostal artery
- C. Internal thoracic artery
- D. Costocervical trunk
- E. Inferior phrenic artery

11. What branches does a. thoracica interna has?

- A. A.musculophrenica, a.epigastrica superior
- B. A. intercostalis, a. phrenica
- C. A. pericardiacophrenica, a. epigastrica inferior
- D. A.a. mediastinales et pericardiacae
- E. A. intercostalis. a. epigastrica superior

12. Left and right coronary arteries starts from:

- A. Aortic arch
- B. Ascending aorta
- C. Internal thoracic artery
- D. Subclavian artery
- E. Pulmonary arteries

13. Aorta consists of the following parts:

- A. Ascending aorta, aortic arch, thoracic aorta, diaphragmatic aorta
- B. Aortic arch, descending aorta, thoracic aorta, diaphragmatic aorta
- C. Aortic arch, horizontal part, thoracic aorta, abdominal aorta
- D. Ascending aorta, aortic arch, thoracic aorta, abdominal aorta
- E. Ascending aorta, aortic arch, diaphragmatic aorta, abdominal aorta

14. The length of ascending aorta is about:

- A. 2 cm
- B. 3 cm
- C. 10 cm
- D. 6 cm
- E. 15 cm

15. Aorta carries the blood from:

- A. Left atrium
- B. Right atrium

- C. Left ventricle
- D. Lungs
- E. Right ventricles

16. The arteries arising from the arch of the aorta are the following (from right to left):

- A. Left subclavian artery, left common carotid artery, right subclavian artery
- B. Right subclavian artery, left common carotid artery, left subclavian artery
- C. Brachiocephalic trunk, right common carotid artery, left subclavian artery
- D. Brachiocephalic trunk, left common carotid artery, left subclavian artery
- E. Left common carotid artery, brachiocephalic trunk, left subclavian artery

17. Which of the following arteries or branches does not originate directly from aorta?

- A. Esophageal branches
- B. Mediastinal branches
- C. Right common carotid artery
- D. Left common carotid artery
- E. Left subclavian artery

18. Descending part of aorta starts at the level of vertebra:

- A. Th 1
- B. Th 2
- C. Th 3
- D. Th 4
- E. Th 5

19. The initial part of the ascending aorta is also known as:

- A. Bulb
- B. Core
- C. Isthmus
- D. Valve
- E. Arch

20. Ascending aorta starts at the level of:

- A. First intercostal space
- B. Second intercostal space
- C. Third intercostal space
- D. Fourth intercostal space
- E. Fifth intercostal space

ANSWERS:

1	C
2	C
3	D
4	C
5	A
6	A
7	B
8	D
9	E
10	D
11	A
12	B
13	D
14	D
15	C
16	D
17	C
18	D
19	A
20	C