



ANATOMICAL STRUCTURE OF THE RESPIRATORY SYSTEM ORGANS AND THEIR SIGNIFICANCE IN THE HUMAN BODY

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Abstract: This article analyzes the anatomical structure of the organs of the human respiratory system and their role in the functioning of the body. The respiratory system is important in providing the body with oxygen and removing carbon dioxide gas formed during metabolism. The article discusses the anatomical structure of the nasal cavity, larynx, trachea, bronchi and lungs, which are the main parts of the respiratory system, and their interrelationships based on scientific sources. It also examines the anatomical foundations of the gas exchange process in the alveoli of the lungs. The study of the structure of the organs of the respiratory system and their functional properties is of great importance in medical practice and serves as the main scientific foundation for the diagnosis and treatment of various respiratory diseases.

Keywords: Respiratory system, anatomy, nasal cavity, larynx, trachea, bronchi, lungs, alveoli, gas exchange.

Introduction: The respiratory system is one of the most important vital systems in the human body. This system serves to provide the body with oxygen and remove carbon dioxide gas formed during metabolism. The process of respiration ensures the production of energy in cells, the uninterrupted continuation of metabolic processes, and the normal functioning of the body. If the respiratory system is disrupted, the body will lack oxygen, which can lead to disruption of many vital processes.

The respiratory system consists of several important anatomical structures that are inextricably linked to each other. This system includes the nasal cavity, larynx, trachea, bronchi, and lungs. Each organ has its own anatomical structure and performs an important function in the respiratory process. For example, the air entering through the nasal cavity is cleaned, heated, and humidified. The larynx not only performs the function of air passage, but also participates in the formation of sound. The trachea and bronchi deliver air flow to the lungs, and gas exchange occurs in the alveoli of the lungs.

A deep study of the anatomical structure of the respiratory system is of great importance in medical science. Because knowledge of the structure and functions of this system serves as an important scientific basis for diagnosing



various diseases, understanding their causes, and developing effective treatment methods. Diseases related to the respiratory system, such as bronchitis, pneumonia, asthma and other pathological conditions, are common in medical practice. Therefore, an in-depth study of the anatomical features of this system is necessary for every medical worker.

The main purpose of this article is to study the anatomical structure of the organs of the human respiratory system based on scientific sources and to highlight their importance in the functioning of the body. The interconnection of the organs of the respiratory system and their role in the process of gas exchange are also analyzed.

The human respiratory system is anatomically divided into the upper and lower respiratory tracts. The upper respiratory tract includes the nasal cavity, nasal passages and larynx. The lower respiratory tract consists of the larynx, trachea, bronchi and lungs. These structures are inextricably linked to each other, forming a single anatomical system that delivers air flow from the external environment to the alveoli of the lungs.

The nasal cavity is the initial part of the respiratory system. It consists of two parts, divided into right and left parts by the nasal septum. The walls of the nasal cavity contain the upper, middle, and lower nasal conchae, which regulate the direction of air flow. The mucous membrane of the nasal cavity is rich in blood vessels and performs the function of warming, humidifying, and cleaning the inhaled air from dust particles.

The nasal cavity is connected to the larynx from the back. The larynx is anatomically divided into three parts: the nasopharynx (nasopharyngeal part), the oropharynx (oropharyngeal part) and the larynx-larynx (laryngopharyngeal part). The larynx is connected to the respiratory system as well as the digestive system, directing the air flow towards the larynx.

The larynx is located between the larynx and the trachea and is a complex anatomical structure consisting of cartilages. The skeleton of the larynx consists of the thyroid, cricoid and sphenoid cartilages. These cartilages are interconnected by ligaments and muscles, forming the laryngeal cavity. The vocal cords are located inside the larynx, which are involved in controlling breathing and phonation.

At the bottom, the larynx passes into the trachea. The trachea is a tube-shaped organ about 10–12 cm long and consists of 16–20 semicircular cartilages. These cartilages hold the tracheal wall firmly and ensure that the airway remains open. The trachea is divided into two main bronchi at the bottom: the right and left bronchus.

After entering the lungs, the bronchi branch into smaller bronchi and bronchioles. This branching process is called the bronchial tree. The last part of



the bronchial tree ends with the alveolar ducts and alveoli. The alveoli are the main functional units of the lungs. Their walls are very thin and densely covered with capillary blood vessels. It is here that gas exchange between oxygen and carbon dioxide takes place.

The lungs are a pair of organs located in the chest cavity, the right lung consists of three lobes and the left lung consists of two lobes. The outer surface of the lungs is covered with a pleural membrane. The pleura consists of two layers, between which is the pleural cavity. This cavity ensures free movement of the lungs during breathing.

The upper respiratory tract includes the nasal cavity (cavitas nasi) and the larynx (pharynx). These structures perform the function of cleaning, humidifying and warming the air entering from the external environment before it reaches the lungs.

The nasal cavity (cavitas nasi) is located within the facial skeleton and is divided into right and left halves by the nasal septum. On its side walls there are three bone plates: concha nasalis superior, concha nasalis media and concha nasalis inferior. These shells form the nasal passages, and between them are the meatus nasi superior, meatus nasi medius and meatus nasi inferior. The inner surface of the nasal cavity is covered with tunica mucosa, which is a layer of ciliated epithelium and rich in blood vessels. As a result, the inhaled air is heated, moistened and cleaned of dust particles. In the upper part of the nasal cavity is the regio olfactoria, which contains the receptors for smell.

The nasal cavity communicates posteriorly with the pharynx through the choanae. The larynx is a muscular tube-shaped organ that extends from the base of the skull to the level of the VI cervical vertebra. The larynx is divided into three parts: pars nasalis pharyngis (nasopharynx), pars oralis pharyngis (oropharynx) and pars laryngea pharyngis (laryngopharynx). The nasopharynx is adjacent to the nasal cavity, where the tonsilla pharyngealis is located. The oropharynx is connected to the oral cavity, and the laryngopharynx is connected to the larynx at the bottom, providing air passage to the next section.

The trachea (trachea) begins at the bottom of the larynx and divides into the main bronchi of the lungs. The trachea is about 10–12 cm long and consists of 16–20 semicircular cartilages. These cartilages keep the tracheal wall strong and ensure that the air remains open. The inner surface of the trachea is covered with tunica mucosa, which contains epithelium and mucus-producing glands. This layer plays an important role in cleaning and humidifying the incoming air. The trachea is divided into the right and left main bronchi at the bottom.

The bronchi (bronchi) branch after entering the lungs, this process is called bronchial tree is called the arbor bronchialis. The main bronchi are divided into smaller bronchioles at the lower levels. At the end of the



bronchioles are the alveolar ducts and alveoli (alveoli pulmonales). The alveoli are the main functional unit of the lungs. Their walls are very thin and are surrounded by capillary blood vessels. Here, oxygen passes into the blood, and carbon dioxide passes from the blood to the alveoli - this is the process of gas exchange.

The lungs (pulmo) are a pair of organs located in the chest cavity, the right lung consists of three lobes, and the left lung consists of two lobes. The surface of the lungs is covered with pleura parietalis, and the layer covering the lung itself is called pleura visceralis. The pleural cavity contains fluid, which facilitates the movement of the lungs.

The organs of the respiratory system are inextricably linked to each other and effectively carry out the process of oxygen and carbon dioxide exchange. The upper respiratory tract functions to filter, warm, and humidify air, the larynx controls the airway and participates in phonation. The trachea and bronchi deliver air flow to the alveoli of the lungs, and the lungs function as the main organ of gas exchange.

Conclusion:

The anatomical structure and interrelationships of the organs of the human respiratory system are very important for the normal functioning of the organism. Each organ has its own anatomical features and functions, which together carry out the process of oxygen supply and carbon dioxide removal. A complete anatomical study of the respiratory system is an important scientific foundation for the diagnosis, prevention and treatment of various respiratory diseases.

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