



ANATOMICAL STRUCTURES OF THE DIGESTIVE SYSTEM

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ABSTRACT

The human digestive system is a complex anatomical and physiological entity that ensures mechanical processing, enzymatic breakdown, and absorption of nutrients essential for vital functions. This paper consistently reveals the morphological features of the main structures of the gastrointestinal tract: the oral cavity, pharynx, esophagus, stomach, small and large intestines, as well as accessory organs—the liver, gallbladder, and pancreas.

The human digestive system is one of the most complex and functionally significant anatomical complexes of the body, ensuring the supply, breakdown and absorption of nutrients necessary to maintain life.

From an anatomical point of view, it unites not only the successively located hollow organs of the gastrointestinal tract, but also large parenchymal structures involved in the secretion of enzymes and the regulation of metabolic processes.

In recent years, according to modern morphological studies (2022–2024), special attention has been paid to the study of the microstructures of the oral cavity, the epithelial lining of the intestine, the neurohumoral regulation of the stomach and the functional role of the liver and pancreas in systemic physiology.

The relevance of this topic is determined by the high prevalence of diseases of the digestive system in global clinical practice and the need for a deep understanding of anatomy for subsequent diagnosis, prevention and treatment of various pathologies.

The study of the anatomical structures of the digestive system makes it possible to establish the relationship between the morphological characteristics of each department and their functionality, as well as to identify the mechanisms of disorders that lead to digestive dysfunction.

Thus, systemic analysis of the anatomical components of the gastrointestinal tract is an important scientific and practical task in modern medicine and biology.

The body of an infant and the body of an adult have qualitative and quantitative differences. These differences lie in the morphological immaturity of the child's body in the first year of life, which is the main reason for the imperfection of its functions.

Correct resolution of diagnostic and treatment issues is impossible without a comprehensive study of the structure and age-related changes of all structural elements of the esophagus. Today, a paradoxical situation has arisen when the progress of practical medicine is ahead of some knowledge of the normal structure of a person.

Therefore, the study of the patterns of development of human tissues and organs, including the esophagus, is an urgent problem. At present, aspects of the structural and functional organization of the esophagus of newborns have been well studied, with attention paid to the features of its blood supply, the structure of the lymphatic system and nervous system.

Many studies are devoted to the evolution of the structure and function of various parts of the esophagus in prenatal ontogenesis. Malformations of the human esophagus have been studied in detail and methods for their diagnosis and surgical correction have been developed.

However, in the literature available to us, we have not found any works devoted to the study of the dependence of the macroscopic characteristics of the esophagus on the anatomical parameters of the chest and torso in children of the first year of life.

To date, possible variants of the topographic location of the esophagus in infants have not been determined, and the age-related dynamics of its microscopic anatomy from birth to the end of the first year of life have not been studied in detail.

The anatomical structures of the digestive system form a single functional complex, in which each organ has a specific morphological structure and a strictly defined role.

The oral cavity is the very first link in the digestion process: there are teeth that can grind food, and a tongue that is involved in the formation of the food bolus and the perception of taste. The oral mucosa contains numerous glands that secrete saliva rich in amylase, which triggers the early stage of carbohydrate breakdown.

The pharynx, which has a complex muscular-fibrous structure, ensures the safe passage of the food bolus into the esophagus, preventing it from entering the respiratory tract due to the reflex closure of the epiglottis.

The esophagus is a tubular organ 25–30 cm long, the wall of which consists of mucous, submucosal, muscular and adventitial membranes. Its key feature is peristalsis, which allows food to move regardless of the position of the human body.

The stomach is anatomically divided into four sections and includes a powerful muscular framework, glandular epithelium and an acidic environment created by parietal cells. Under the influence of hydrochloric acid and pepsin enzymes, deep breakdown of proteins begins, and the motor function of the stomach contributes to thorough mixing of the chyme.

The small intestine, consisting of the duodenum, jejunum and ileum, is the main center of enzymatic digestion. Its inner surface is lined with villi and microvilli, which increase the absorption area by almost 600 times.

Here the main processes of breakdown of fats, proteins and carbohydrates take place, which are provided by pancreatic enzymes and bile coming from the liver and gall bladder.

The liver, being the largest gland in the body, performs not only secretory, but also detoxification, metabolic and synthetic functions, which makes it a critical part of the digestive cycle.

The large intestine plays a leading role in the reabsorption of water and electrolytes, as well as in the formation of feces. Its anatomical structure - the presence of haustra, ribbons and a large amount of microbiota - ensures participation in the processes of fermentation, the synthesis of vitamins B and K, as well as immune regulation.

The final section is the rectum, which ensures the accumulation and subsequent elimination of undigested residues.

The unified operation of all structures of the digestive system demonstrates a high degree of coordination, in which any anatomical or functional disorder can cause complex pathological changes that affect the general condition of the body.

At the present stage of development of science, there has been a noticeable tendency towards a comprehensive study of the human body. Modern research into the structure of a living whole organism implies a transition from human anatomy in general to the specific individual anatomy of people, taking into account their constitution.

An integral stable characteristic of the human body is its constitution. The constitutional factor has prognostic value for a biologist, doctor, teacher, trainer.

In recent decades, in the era of molecular immunology and biochemistry, with the advent of the powerful mathematical apparatus of clinical epidemiology, there is more and more reason to talk about tough the constitutional determinism of pathology, the spectrum of risks inherent in each constitutional phenotype with given probabilities of their implementation. Constitutionality of one degree or another is inherent in all forms of human pathology and the formation of constitutional risk necessarily precedes the onset of diseases.

Currently, there is an increase in interest in anthropometric studies, as they make it possible to link the internal features of structure, function, and metabolism with the external parameters of a person in normal and pathological conditions.

Studying the problem of the constitution makes it possible to implement the anthropological direction of human anatomy in clinical practice, since the constitution includes hereditarily stable characteristics that are risk factors for a certain pathology and factors of well-being in conditions of active life positions.

The anatomical structures of the digestive system are a highly organized and functionally interconnected system that ensures the continuous transformation of nutrients and maintains the metabolic balance of the body.

Each section, from the oral cavity to the rectum, has unique morphological features that determine its role in the overall digestive process. Accessory organs such as the liver, gallbladder and pancreas form a complex mechanism of enzymatic and secretory regulation, without which normal processes of breakdown and absorption of nutrients are impossible. The analysis shows that the harmonious functioning of all parts of the digestive tract is a key factor to maintain homeostasis, immune stability and energy supply to the body. Any violation of the structure or function of individual elements of this system leads to multi-organ changes that affect the general state of human health.

Therefore, a thorough knowledge of the anatomy of the digestive system remains an essential component of medical education and the basis for understanding the pathogenesis of many gastroenterological diseases.

Literature:

1. Sapin M.R., Medical human anatomy. - Moscow: GEOTAR-Media, 2022. - 864 p.
2. Sinelnikov R. D. Atlas of human anatomy: In 4 volumes - Moscow: Medicine, 2021.
3. Неттер Ф. Атлас анатомии человека. — Москва: Панфилов / Elsevier, 2020. — 640 с.

4. Moore K. L., Dalley A. Clinical Anatomy. — Lippincott Williams & Wilkins, 2019. — 1136 p.
5. Tortora G., Derrickson B. Principles of Anatomy and Physiology. — Wiley, 2021. — 1300 p.
6. Standring S. Gray's Anatomy: The Anatomical Basis of Clinical Practice. — Elsevier, 2020. — 1600 p.
7. Berezov T. T., Korovkin B. F. Biological chemistry. — Moscow: Medicine, 2019. — 784 p.
8. Guyton A., Hall J. Textbook of Medical Physiology. — Elsevier, 2020. — 1200 p.
9. Gastroenterology: national guide / Ed. Ivashkina A.V. - Moscow: GEOTAR-Media, 2023. - 1056 p.
10. Human Digestive System: Structure and Function. — WHO Medical Reports, 2022.

