MACROANATOMICAL STRUCTURE OF THE PANCREAS

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Abstract
This article discusses the anatomical and physiological structure of the pancreas, its role in the digestive and endocrine systems, as well as the causes and consequences of pancreatic dysfunction. The pancreas is one of the most important mixed glands in the human body. Through the production of digestive enzymes, it participates in the process of digestion, while through the secretion of insulin and other hormones, it regulates metabolism.

Keywords: pancreas, pancreatitis, insulin.

The **pancreas** is one of the most complex and multifunctional glands in the human body. As a mixed secretion gland, it performs both **exocrine** and **endocrine** functions — producing digestive enzymes through its exocrine part and regulating glucose metabolism through hormones such as **insulin, glucagon**, and **somatostatin** in its endocrine part.
From an **anatomical and clinical standpoint**, a deep understanding of the **macroanatomical structure** of the pancreas is essential in gastroenterology, endocrinology, and surgical practice — particularly for minimizing surgical risks in procedures such as **pancreaticoduodenectomy**, treatment of **pancreatic cysts**, and **neoplasms**.
The pancreas is **retroperitoneally located**, positioned between the **posterior wall of the stomach (paries posterior ventriculi)** and the **duodenal loops (duodenum)**, at the level of the **L1–L2 vertebrae**.
In a healthy adult, the pancreas measures on average **15–20 cm in length**, **2–3 cm in thickness**, and weighs **70–100 g**. Morphometric studies indicate that the **size and weight** of the pancreas depend on **gender, age**, and **anthropometric parameters**: in men, the average weight is **85 ± 12 g**, while in women, it is **73 ± 10 g**.
Anatomically, the **pancreas** consists of three main parts: the **head (caput pancreatis)**, the **body (corpus pancreatis)**, and the **tail (cauda pancreatis)**.
The **head of the pancreas** is located within the **duodenal loop**, and in surgical practice—particularly during **pancreaticoduodenectomy**—this region requires high technical precision.
The **body of the pancreas** lies anterior to the **vertebral column**, with its **posterior surface (facies posterior)** closely related to the **splenic vein (vena lienalis)**, **abdominal aorta (aorta**

abdominalis), and **left renal vein (vena renalis sinistra)**. The **tail of the pancreas** extends toward the **splenic hilum (hilum lienis)** and represents the area where the **endocrine activity** of the gland is relatively high.

The **ductal system (systema ductale)** of the pancreas, represented mainly by the **main pancreatic duct (ductus pancreaticus, Wirsung's duct)**, holds great **clinical significance**. In approximately **90% of cases**, the **main duct** joins the **common bile duct (ductus choledochus)** and opens into the **duodenum** through the **major duodenal papilla (papilla duodeni major)**.

According to statistical data, in about **10–12%** of the population, an **accessory pancreatic duct (ductus pancreaticus accessorius, Santorini's duct)** remains functionally active. These **anatomical variations** play an important role in determining **surgical strategy** during operations involving **pancreatic tumors** and **cystic formations**.

The **blood supply** of the pancreas is also **complex and segmental** in nature. The **head** is supplied by branches of the **superior and inferior pancreaticoduodenal arteries (arteria pancreaticoduodenalis superior et inferior)**, while the **body** and **tail** are nourished by branches of the **splenic artery (arteria lienalis)**. **Venous drainage** occurs via the **pancreaticoduodenal vein** and the **splenic vein**, which ultimately drain into the **portal vein (vena portae hepatis)**. Studies indicate that **individual variations** in the **arterial branching pattern** are observed in **12–15% of cases**, which necessitates **preoperative identification** to minimize **intraoperative bleeding**.

In recent years, **magnetic resonance imaging (MRI)**, **computed tomography (CT)**, and **3D angiography** have enabled precise visualization of the **segmental structure**, **ductal system**, and **vascular supply** of the pancreas. These advanced imaging techniques are **clinically significant** for diagnosing **pancreatic tumors** and **inflammatory processes**, determining the **extent of resection**, and **reducing postoperative complications**.

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