

## BAZELE ANATOMICE ALE PATOLOGIEI DIAFRAGMEI [ANATOMICAL BASES OF DIAPHRAGMATIC PATHOLOGY] BY FRANCISC GRIGORESCU SIDO

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The monograph "Anatomical bases of diaphragmatic pathology" describes the thoraco-abdominal diaphragma, a septum that separates the thoracic and abdominal cavities, from different points of view: ontogenesis, anatomy, biology, pathology, etc. The diaphragm is of major practical interest in surgery and radiology, while aspects such as ontogenesis and anatomy often emerge as secondary issues. There is a large number of publications regarding the diaphragm, with different and in partly controversial opinions.

In chapter I "History", the author presents historical data about the etymology of the diaphragm, some personalities with important contributions to the anatomy, embryology and pathology of the organ, as well as citations of original descriptions concerning several anatomical structures: Larrey triangle, Morgagni hiatus, Bochdalek triangle).

Chapter II "Introduction" emphasizes the anatomical and embryological nomenclature, as it developed over time.

Chapter III, entitled "General aspects of the biology of development", contains data on embryo-fetal status in humans and experimental animals, knowledge on issue-associated genetics, epigenetics, embryonal induction, embryogenesis, with focus on mesoderm, mesothelium and celoma.

Chapter IV "Mechanical forces and live structures" outlines the important role of mechanical forces in the embryo- and histogenesis of mechano-sensitive tissues and organs. The intrinsic and extrinsic mechanical forces, to which the body is subjected throughout the whole life, generate the need for permanent adaptation of body organs, including the diaphragm. The structure and architecture of tissues and organs follow the rule "minimum of material, maximum of mechanical efficiency".

The following chapters V, VI and VII describe the development of the heart, lungs and liver, organs which are in a close chemical relationship to the diaphragm in early developmental stages and mechanically related in later stages, both in normal and in pathological conditions.

Chapter VIII "Ontogenesis of the diaphragm. Literature" outlines a large number of sometimes divergent opinions from different publications. The prenatal period contains classical and current descriptions of the development of the diaphragm, embryogenesis, histogenesis, innervation as well as chemical and mechanical influences from neighbor organs. The postnatal ontogenesis is described in detail mainly by disease-associated publications from surgery and imaging, with practical-therapeutic consequences.

Chapter IX "Personal opinions on the ontogenesis of the diaphragm" presents aspects related to the origin and evolution of the diaphragmatic mesenchymal sources, muscle transformation (somatic origin, migration, colonization of the diaphragm and differentiation of the myoblasts), innervation and vascularization. The development of the mesenchymal diaphragm in the parieto-mesothelial space allows the hypothesis that the mesenchymal sources of the diaphragm (pleuoperitoneal fold, transverse septum etc.) are unitary mesenchymal elements, realizing a functional continuum. The myoblastic colonization of the diaphragm emerges from posterior to anterior. The differentiation of myoblasts starts only once they get to the right place and the spatial orientation of myofibriles is different in the anterior, lateral and posterior region of the diaphragm. The radial distribution of myofibriles in these regions emerges under the action of mechanical forces (general fetal movements, fetal respiration), which act on the diaphragm from the 5th week of gestation.

Chapter X "The anatomy of the diaphragm in adults" contains anatomical descriptions based on 130 anatomical pieces, which add to the information about the

diaphragm at different ages and sexes, nutritional statuses and morphotypes. The anatomical description of some detailed aspects which are difficult to be assessed by clinical or imaging means, contribute to the knowledge about the dynamics of diaphragmatic hernias (anterior diaphragmatic hernias, anterior fat hernias, epiploceles, etc).

The association of information from literature with those of original research allow the author to provide clarifications and corrections on some anatomic and pathological controverted aspects, such as: sternum, esophageal hiatal region, parieto-frenic region (described by the author), vascularization and innervation of the diaphragm. Some original observations lead to the possibility of more conservative radial frenotomies.

Chapter XI presents the topic of diaphragmatic hernias, analyzes the types of hernias (congenital and acquired), describes localizations, classifications and the frequency of different diaphragmatic hernias.

The monograph demonstrates that anatomy, including dissection methods, contributes to valuable surgical and imaging knowledge. The diagnosis of congenital diaphragmatic hernias in the elderly, described in recent publications, is an example in this direction. Optimal surgical procedures and imaging interpretations should be based on a solid knowledge of pre- and postnatal diaphragmatic ontogenesis, with its normal and pathological variants.

The book is written in an extensive, analytical and very accurate manner, based on a large body of literature evidence and an impressive personal experience of the author. Its content offers answers and solutions for many issues debated in the literature on the topic and could be therefore warmly and strongly recommended to specialists in anatomy, pathology, surgery and radiology.

**Iulian Opincariu**