

Article

Morphological Peculiarities of the Pelvic Autonomic Nervous System and Their Impact on Clinical Interventions in the Lesser Pelvic Region

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Abstract: *Background:* The aim of the work is to define the morphological peculiarities of the pelvic autonomic nervous system (ANS) and their importance in the clinical and surgical interventions in the lesser pelvis. *Material and methods:* Anatomical variations in the formation of the pelvic ANS were observed in 20 cadavers. The study included 17 men (85%), aged 18 to 84, and 3 women, aged 27 to 86. The average age was 53.8 years. The subjects most often died by violent death in car accidents, by asphyxia, or by sudden death. The study was approved by the Ethics Committee of the Health Care Surveillance Authority, Bratislava, Slovakia. We studied cadavers without congenital or detected anomalies, cancer, deformities of the body, or spinal or abdominal surgeries within 24 h of death. We observed a relationship between the dimensions and the number of ganglia, as well as the number and course of nerve branches and anastomoses. In the pelvic area, we observed the hypogastric plexus superior, hypogastric plexus inferior, and the truncus sympathicus. In all cadavers, we clarified the lumbosacral plexuses after evisceration. In the lumbosacral region, the roots were defined based on their participation in the formation of the plexuses. To show the intimate relationship between both systems, we also focused on the details of the structure (rami communicantes) related to the connections of the ANS with the spinal nervous system. *Results:* Anatomical variations in the formation of the pelvic ANS were observed in all cases. We included cases with more than two truncus sympathicus ganglia as the segmental type. The segmental form occurred in 14 (70%) cases, and was concentrated in 6 (30%) cases. Rami communicantes provided anastomoses to the spinal nerves. Small ganglia were observed on the rami communicantes. With the concentrated type, we observed the division of the sympathetic and parasympathetic systems. With the segmental and concentrated forms, symptoms of the “diffuse form” may occur, which we observed in all cases. We observed significant right-left asymmetry and differences in the formation of ganglia and anastomoses. *Conclusions:* This study allowed us to identify and describe the morphological peculiarities of the pelvic ANS and their possible influence on the clinical picture. Asymmetry and dependence of their occurrence on the type of ANS was observed. The variations were frequent. Their preoperative diagnosis is difficult to impossible. The absence or lack of intraoperative vigilance can lead to the damage of pelvic ANS during operations and blockades of the pelvic plexus. The acquired knowledge can be helpful in clarifying clinical signs and symptoms of these conditions.

Keywords: autonomic nervous system (ANS); anatomical variations; pelvic ANS and plexus; health



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The Autonomic Nervous System Morphological Comparative Clinical And Surgical Aspects

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complete in 5 volumes represents a monumental expansion of the early lectures The Physiology of the Lower Urinary Tract Michael Torrens, John F.B. Morrison, 2012-12-06 In this book we attempt a synthesis of knowledge from two investigative extremes On the one hand neurophysiology and neuropharmacology are progressing via the single neuron to a subcellular level on the other clinicians are studying the function of the human urinary system in vivo as a whole A special effort must be made over the next decade to bridge this gap We hope that the information summarized here will catalyse the process In 1968 de Groat and Ryall published a group of papers in the Journal of Physiology in which modern quantitative electrophysiological techniques were applied to the study of the reflexes that regulate bladder Junction These papers represent a landmark in the history of bladder neurophysiology forming a dividing line between old and new The earlier techniques of lesioning and stimulation of nervous structures yielded mainly qualitative information which was open to criticism because of lack of precise control over what was actually being destroyed or stimulated Much of this earlier work was reviewed in an authoritative volume by Bors and Comarr in 1971 entitled Neurological Urology The 16 years have seen great advances in our understanding of the control of lower subsequent urinary tract function **Spinal Cord Injury** Joost Verhaagen, John W. McDonald, 2012-12-31 Handbook of Clinical Neurology Spinal Cord Injury summarizes advances in the clinical diagnosis monitoring prognostication treatment and management of spinal cord injuries More specifically it looks at new and important developments in areas such as high resolution noninvasive neuroimaging surgery and electrical stimulation of motor respiratory bladder bowel and sexual functions It also reviews the latest insights into spontaneous regeneration and recovery of function following rehabilitation with emphasis on novel therapeutic strategies such as gene therapy transcranial stimulation brain machine interfaces pharmacological approaches molecular target discovery and the use of olfactory ensheathing cells stem cells and precursor cells Organized in five sections the book begins with an overview of the development maturation biomechanics and anatomy of the spinal cord before proceeding with a discussion of clinical diagnosis and prognosis as well as natural recovery ambulation and function following spinal cord injury It then examines clinical neurophysiology in the prognosis and monitoring of traumatic spinal cord injury medical surgical and rehabilitative management of spinal cord trauma and some new approaches for improving recovery in patients including restoration of function by electrical stimulation locomotor training and the use of robotics Other chapters cover cell transplantation artificial scaffolds experimental pharmacological interventions and molecular and combinatorial strategies for repairing the injured spinal cord This volume should be of interest to neuroscience and clinical neurology research specialists and practicing neurologists Comprehensive coverage of the latest scientific understanding of spinal cord injuries Detailed coverage of current treatment best practices and potential future treatments Connects leading edge research programs to future treatment opportunities Bonica's Management of Pain Jane C. Ballantyne, Scott M. Fishman, James P. Rathmell, 2018-11-19 Publisher's Note Products purchased from 3rd Party sellers are not guaranteed by the Publisher for

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