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Topographic Peculiarities of Interfascial Spaces in the Thoraco-Abdominal Region. Implications in Loco-Regional Anesthesia

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Abstract: ***Aim of the study.*** To study cellular spaces, as compartments lined with lax connective tissue, bounded by fascia, muscle, bone and other anatomical structures. They may contain different anatomical elements such as vessels, nerves and lymph nodes. According to their anatomic-topographic localization we distinguish subcutaneous, interfascial, sub and interserosal, subfascial, osteo-fascial, parafascial, paravasosal, paraneural, paraarticular and paravisceral. Terminal branches of peripheral nerves are also located in them, thus there is the possibility to perform loco-regional blocks by injecting AL into the respective compartments. ***Material and Methods.*** This study is based both on the bibliographic analysis of the literature in the field of topographic anatomy and loco-regional anesthesia, and on our own experience within the ITA section of the Oncological Institute of Moldova. The chosen resources included fundamental textbooks and papers from recognized scientific journals published in the last 15 years. ***Results.*** Subfascial cellular spaces are located beneath the fascia propria (deep fascia) surrounding one or groups of muscles, between which are located intermuscular fascial septa or bony surfaces. According to recent research (including imaging methods) of the cellular space (interfascial plane), it is considered to be the space between two septa of the fascia propria (deep) and is presented by adipose tissue, elastin and reticular fibers. It may contain nerves, blood vessels, bone and muscle, and has a fixating, cushioning and lubricating role. Injecting AL into the interfascial space can block both the peripheral branches of nerves within the interfascial space and the nerve endings that distribute into the fascial fascia. Localization of the interfascial space to external landmarks alone is uncertain. Hence the advent of ultrasound with live, real-time visualization of anatomy has revolutionized both medical diagnosis and the technique of loco-regional anesthesia. Elsharkawy et al. suggested that the biomechanical properties of the fascia might play an important role in the diffusion of local anesthetics, and ultrasound can detect changes in the interfascial space during monitoring of LA dispersion. ***Conclusions.*** The knowledge of the anatomic-topographic particularities of the interfascial spaces allows us to understand the mechanism of action, indications, technique and complications of fascial plane anesthesia. With the widespread introduction of ultrasonography (especially hand-held ultrasonography), it became possible to visualize the anatomy in vivo: needle-layer relationship, nerves, vessels, local anesthetic spread. In this aspect the fascial plane blocks have shifted from techniques based on anatomic landmarks to ultrasonographic guidance, and their utilization is increasing.

Keywords: fascia, cellular space, interfascial plane block (IFPB), ultrasound visualization, regional anesthesia.