Discovery of subperiosteal transmission of intra-articular pressures along the skeleton to enhance the paradigm of physical medicine

A floating skeleton concept postulating a hydrostatic connection of the synovial capsules covering the joints was experimentally validated in a first controlled in vivo study. It was discovered that intra-articular pressure is transmitted between synovial joints in a space between the periosteal shell and the bones. This is in contrast with a general convention about a joint capsule as an isolated container with in-joint pressure independent of the pressures in the other capsules. Biomechanical rationale for hydrostatic connection of the joints is a reduction of the pressures applied to the contacting surfaces of the bone heads for protecting the cartilages. This discovery has the potential to revolutionize our understanding of how the skeleton functions. Further analysis is required of morphology and physiology of the system of hydrostatic pressure distribution between contacting joint cartilages. Nevertheless, even before comprehensive knowledge about the new system is obtained, several recommendations for enhancing a paradigm of physical therapy can be developed now. We will discuss in this lecture how the floating skeleton concept suggests for a specific criterion of correctness of physical exercising in preventive and therapeutic practices.

Biography

Mark Pitkin has completed his PhD in Biomechanics of Prosthetics from Institute of Prosthetics, Moscow, Russia and a degree of Doctor of Technical Sciences from LETI University, St. Petersburg, Russia. He is a Professor of Physical Medicine and Rehabilitation at the Tufts University School of Medicine, Boston and President of the Poly-Orth International. He has published more than 90 papers in reputed journals.

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