FASCIA SCIENCE AND CLINICAL APPLICATIONS: EDITORIAL

Why are there so many discussions about the nomenclature of fasciae?

Fascia is often described as an ubiquitous tissue that permeates the human body, organized as a three-dimensional network that surrounds, supports, suspends, protects, connects and divides muscular, skeletal and visceral components of the body (Tozzi, 2012). If we agree with this wide definition, then fasciae could include every connective tissue, loose or dense, regular and irregular, with so many functions that would be impossible to study and understand from a scientific point of view. Can we consider the loose connective tissue, that permits the gliding between different viscera, as fascia? And is it comparable with a fascia lata, that envelops all the muscles of the thigh? Could the peritoneum be considered a fascia? And is it more similar to loose or fibrous connective tissue? Have the visceral and parietal peritoneum the same structures and roles? Can we apply the knowledge that we have for the muscular fasciae to the visceral fasciae?

A wide definition of the fasciae permits support of an holistic vision of the body and the concepts of tensegrity, but it avoids a deeper understanding of this tissue. For example we can’t include in the same definition the loose connective tissue, rich in fat cells that we find under the skin, and the fasciae of the limbs. They have completely different macroscopic, histological and mechanical proprieties, and this suggest also completely different functions. Precise terminology has to be extreme: when we speak about the peritoneum, we need to distinguish the parietal and visceral peritoneum, because the first one is thicker and it is the only one that has a sensitive innervation, while the visceral peritoneum has only an autonomic innervation, and consequently can’t transmit pain. Can we also transfer these conclusions to the pleura, pericardium, vascular sheaths, gland capsules, pelvic fasciae?

When we speak about fasciae, another problem exists: the use of different terms to indicate the same structure. For example in 2011 two fundamental research studies were published: Tesarz et al. (2011) demonstrated that the outer layer of the thoracolumbar fascia and the subcutaneous tissue are richly innerved, while a paper by Corey et al. (2011) conclusively identified sensory nerve fiber terminations within the non-specialized connective tissues of the low back of the rat. Are both these groups speaking about the same structure, or have they analyzed two different things?

In the visceral fasciae the confusion is even greater, and nobody knows exactly what visceral fascia actually is, or if a ligament could be considered part of the visceral fascial system, or another structure. For example Wang et al. (2010) writes: “The existence and composition of the lateral ligaments of the rectum (LLR) are still the subjects of anatomical confusion and surgical misconception up to now”. Really, this ligament seems to have a completely different composition according to different authors:

- For Nano et al. (2000) it contains only fatty tissue and some vessels and nerve filaments that are of little importance. While for Pakart et al. (2005) it is formed by loose connective tissues with a cluster of small nerves. And for Lin et al. (2010) it appeared as a bundle of dense connective tissues traversing between the rectum and visceral fascia.
- Another pelvic ligament, the uterosacral ligament, is described as a condensation of nervous fibers made up of hypogastric and pelvic nerves forming the hypogastric plexus, without any structured ligamentous organization (Ramanah et al., 2009). Earlier, De Caro et al. (1998) affirmed that at the level of the sacrouterine and cardinal ligaments they were unable to find any connective ligamentous structure, but that only an areolar tissue was seen.
- So, the pelvic ligaments are simultaneously fat, loose connective tissue, dense connective tissue, nervous fibers condensations, areolar tissue? And are they in continuity with the pelvic fasciae? But what is a pelvic fascia?

I think that only if we use a restricted definition of fascia, and characterize the various parts that constitute it, can we truly understand the fascial system. If we mix the data about subcutaneous tissue, deep fascia, loose connective tissue ... we can’t compare the results of the different groups of research, and so while fasciae will always remain fascinating, the word is insufficient.

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If we need a term that indicates a tissue that is ubiquitous in the body, that functions like the "glue" that holds the body parts together, the word "connective tissue" would be perfect.

References


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