SHOCK WAVE THERAPY IN PRACTICE

FASCIA TREATMENT WITH SHOCK WAVES

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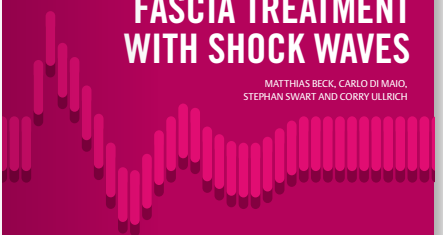


LEVEL 10

CONTENTS

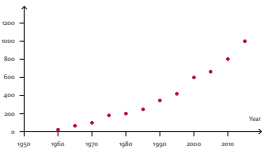
THE FASCIAE OF THE HUMAN BODY

/ Anatomy of the fasciae
/ Macroscopic structure of the fascia
/ Microscopic structure of the fascia

General interest in the fasciae of the human body has grown constantly in recent decades. In 1960 there were fewer than 20 new publications in the field. In 2007, the year of the first Fascia Research Conference in Boston, the number of published papers exceeded 600. Nearly 1000 new publications were listed in PubMed when the fourth Fascia Research Conference took place in Washington in 2015 (Fig. 1). This impressive rise in the number of publication on the fasciae of the human body reflects the growing interest of science and clinicians in the field.

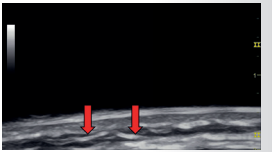
NUMBER OF PUBLICATIONS IN THE YEARS 1960 TO 2015 | *Fig. 1*

Number of new publications on the subject of fasciae (PubMed listings)



In the past two decades the number of new scientific publications per year on the subject of fasciae has grown continuously. More than just a sign of the increasing awareness of the subject matter, this is actually a result of how intensively linked it is with other themes such as the lymphatic system and oncology.

Fig. 8
Retinacula cutis



This high-resolution sonography of the skin and subcutis with stand-off shows the retinacula cutis. They serve as guiding structures for capillaries and unmyelinated nerve fibres that project towards the skin. Many of them correspond to acupuncture points.[9]

DEEP FASCIA IN TRUNK AND EXTREMITIES

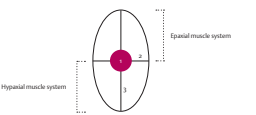
The deep fascia (DF) or muscle fascia forms compartments for striated muscles in the trunk and extremities. These fascial systems develop in embryonic stages, like the muscles they envelop, as an epaxial and hypaxial subsystem (Fig. 9).

The autochthonous back musculature derives from the epaxial system and the ventral trunk and extremity musculature originate with the hypaxial system. In the course of development, proximal muscles of the upper extremity migrate to dorsal and insert themselves over the epaxial system in the form of flattened back muscles (musculus trapezius and latissimus dorsi).

They couple the fasciae of the extremities to the dorsal lamina of the fascia thoracolumbalis (TLF) (Fig. 10). The lower extremity shows comparable connections between the gluteal musculature and the TLF.

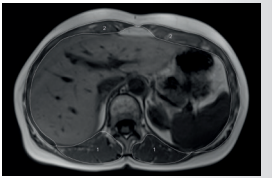
The muscles and fasciae of the epaxial components are innervated by the rami dorsales of the nervi spinales, whereas on the other hand the hypaxial muscles and their fascial sheaths are supplied by the rami ventrales of the nervi spinales.

EPAXIAL AND HYPAXIAL MUSCLE AND FASCIAL SYSTEM | *Fig. 9*



The embryo is divided by the horizontal (2) and vertical (3) septa. Dorsal to the embryonal precursor structure of the spinal column (1) the epaxial muscle system develops and, ventral to this, the hypaxial system (ventral trunk and extremity musculature).

Fig. 10
Breakdown of the muscle and fascial systems of the trunk



The figure shows a transversal section at the level of the lower thoracic spine. The autochthonous back muscles (1) border on the hypaxial ventral musculature of the trunk wall (2) and that of the upper extremities. This like the epaxial an hypaxial fascial systems.

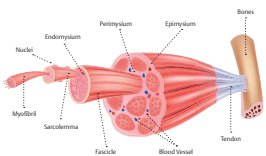
The fasciae of the extremities are divided into different sections (e.g. the fascia brachii and die fascia antebrachii or fascia lata and fascia cruris) and compartments (flexor and extensor compartments). In large joints of the extremities these transition into one another or find their proximal connection to the trunk fascial system.

Within the compartment thus developed one finds, in addition to musculature, the conductive structures (nerves and blood and lymph vessels) of the extremities. These are often encased in a sheath, also made of connective tissue – the epifascicular and exterior epineurium (see chapter: "Fascia of the nervous system").

INTRAMUSCULAR FASCIAE

Muscle fibrils are bound together by the endomysium, which is comprised of loose connective tissue, to make muscle fibres (primary bundle) that form secondary bundles surrounded by the perimysium. Taken together, the latter form a striated skeletal muscle separated from adjacent structures ((synergist and antagonist, bones and deep muscle fascia) by the epimysium (Fig. 11). The crosslinking of the intramuscular fasciae conducts the contraction of the muscle fibres both longitudinally, to the origins / insertions of the muscles, and transversally.

INTRAMUSCULAR FASCIAE | *Fig. 11*



The intramuscular fasciae, the endomysium, epimysium and perimysium, structure the inner divisions of the skeletal muscles and provide for the longitudinal and transversal transfer of forces during muscle contraction.