Министерство образования и науки РФ
Российская академия медицинских наук
Комитет по здравоохранению Санкт - Петербурга
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Санкт-Петербургский государственный политехнический университет

«ЗДОРОВЬЕ – ОСНОВА ЧЕЛОВЕЧЕСКОГО ПОТЕНЦИАЛА: ПРОБЛЕМЫ И ПУТИ ИХ РЕШЕНИЯ »

ТРУДЫ
Четвертой Всероссийской научно-практической конференции
с международным участием

24 – 26 ноября 2009 г.

Санкт-Петербург
2009

Здоровье — основа человеческого потенциала: проблемы и пути их решения: Труды Четвертой Всерос. науч.-практ. конф. с междунар. участием. – СПб.: Вести, 2009. 572 с.

В книге опубликованы тезисы докладов и статьи, отражающие уровень и динамику заболеваемости и смертности по основным группам заболеваний среди населения. Приводятся сведения о демографических процессах в нашей стране и за рубежом с учетом социально-экономических и экологических аспектов. Поднимаются проблемы образования, психологии, педагогики, философии и истории медицины и здравоохранения. Предлагаются пути улучшения здоровья населения в стране и ее отдельных регионах, городах и учреждениях.

Труды конференции подготовили д.м.н. С.А. Варзин и О.Ю. Тарасковская.

ISSN 2076-4618

Ministry of education and science of RF
Russian Academy of medical science
Health care Committee of Saint-Petersburg
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MATERIALS OF CONFERENCE

24-26 of November, 2009

Saint-Petersburg,
2009

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SOFT TISSUES AND BONY STRUCTURES OF THE FINGER, CONTRIBUTING TO HAND FUNCTION, IN HEALTH AND DISEASE

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Modern imaging has widely attributed to our current knowledge of hand and finger morphology and function, in health as well as in disease. Classic authors dealing with the hand like Kanavel (1921) [1], Bunnell (1942)[2] and Landsmeer (1976)[3] displayed and functionally interpreted many anatomical details of the finger, some of which we wish to bring forward here again, especially in view of present-day imaging techniques [4].
Our attention will focus on soft tissues like some extensor tendon fibre bundles, collateral ligaments, and on some bony structures, most of which are in close relation to the proximal interphalangeal joint of the finger.

The extensor assembly of the finger (Bunnell, 1942) [2], consisting of tendon fibers from extrinsic and intrinsic finger muscles, and rearranged into one medial bundle and two lateral bundles, undergoes distal displacement during proximal interphalangeal flexion. The lateral bundles of the extensor assembly, conjoining distally into one terminal extensor tendon for the distal phalanx, lie "slack" alongside the flexed proximal interphalangeal joint (Landsmeer, 1976) [3]. The distal phalanx thereby becomes "loose", thus allowing simultaneous distal interphalangeal flexion. During unresisted flexion of only the proximal interphalangeal joint of the finger, so without any simultaneous distal interphalangeal flexion, the phenomenon of a "floating distal phalanx" may consequently be observed (Tubiana *et al.*, 1996) [5].

In the extended proximal interphalangeal joint, the position of the *ligamenta collateralia propria* or proper collateral ligaments of this joint coincides with an almost frontal plane. They thus help the lateral bundles of the extensor assembly to maintain dorsal positions. After proximal interphalangeal flexion these proper collateral ligaments show more transversal positions with respect to the proximal (or first) phalanx's head. Now the lateral bundles of the extensor assembly can shift in palmar and distal directions, thus enabling subsequent flexion of the distal interphalangeal joint as well. Thereby the lateral bundles assume almost sagittal positions alongside the trochlea of the proximal interphalangeal joint (Van Zwieten *et al.*, 2008) [6].

Compared to the medial bundle's trajectory, which is confined to the sulcus of the trochlea of the head of the first phalanx, the lateral bundles appear to have more freedom during their shift in palmar and distal directions. Although displacements of the lateral bundles of the extensor assembly are therefore described as more or less unrestrained at proximal interphalangeal joint level (Landsmeer & Van Zwieten, 1974) [7], bony structures do exert their influences on them as well. Especially a short edgy *linea aspera*, of about a few millimeters length, proximal to each condyle of the first phalanx's trochlea, may be mentioned here in detail.

Close observation of the semicylindrical dorsal surface of the first phalanx's shaft in a dry bony finger specimen will usually reveal this minuscule shallow buttress of each condyle of the trochlea. In a lateral view of an osteological specimen of the proximal phalanx, the uppermost edge of this short *linea aspera* turns out to be the margin of the area where the proper collateral ligament of the proximal interphalangeal joint arises. Its field of attachment stretches further out, over the lateral side of either condyle of the trochlea.

At the present, modern imaging offers exquisite methods to visualize this bony ridge. Although atlases on hand anatomy (*e.g.* Landsmeer, 1976) [3] as well as hand surgery (*e.g.* Schmidt & Lanz, 2004) [8] do present this structure in several of their illustrations (without indicating it in particular however), it is in fact the technique of *MRI-slicing* that brings this tiny *linea aspera* clearly into view. Sagittal slices like in Moeller & Reif (2007) [9] (p.108) show its characteristic glacis-like slope, from about the distal one-fifth of the dorsum of the proximal phalanx, until the knob-like onset of the condyle of the trochlea. Transverse MRI-slices on the other hand, like in Lewis *et al.* (1996) [10] (fig 4b), illustrate the accentuated edge of the line, bordering the proper collateral ligament attachment right below it. The textbook by Kanavel (1921) [1], by the way, presents exactly the same structures in a transverse anatomical section, at proximal interphalangeal joint level (p 430)

Apart from functioning as an attachment line for the proper collateral ligament, this *linea aspera* does act as a minute bulge, by which free palmar shifting of the lateral bundles of the extensor assembly is more or less restrained, during flexion of the finger (Van Zwieten, 1980) [11]. This will eventually influence quantitatively the coupling of distal interphalangeal flexion to proximal interphalangeal flexion, in normal finger function as well as during finger dysfunction. Examples of the latter can be seen after long standing ulnar entrapment neuropathy, the so-called "intrinsic-minus fingers". Such entrapment neuropathies may occur in PC-workers

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