



NEDERLANDSE ANATOMEN VERENIGING

**178^{STE} WETENSCHAPPELIJKE
VERGADERING**



Carlo Ruini (1530 – 1598)
Anatomia del cavallo, infermità, et suoi rimedii (1598)

VRIJDAG 8 EN ZATERDAG 9 JANUARI 2016

**CONGRESCENTRUM "DE WERELT"
LUNTEREN**

P11

Aspects of the extensor assembly of the finger during interphalangeal flexion

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Introduction

In view of the estimated 58 billion proximal interphalangeal (PIP) joints present in fingers of currently living humans worldwide (Source: <http://populationpyramid.net/world/2015/>), in-vivo data about the precise positions of the tendinous lateral bundles (or lateral bands) of the extensor assembly of the finger in PIP flexion, prior to or simultaneous with distal interphalangeal (DIP) flexion, remain remarkably scarce. Landsmeer (1979) states that in PIP flexion "...the lateral bands ... run along the shoulders of the trochlea of the proximal interphalangeal joint". According to Tubiana et al. (1996), "...these fiber bands glide along the posterolateral aspect of the joint during flexion movements ...". "Normally, palmar gliding of the lateral bands ... never descends below the transverse axis of the PIP joint." (Source: <http://www.slideshare.net/aminharsh1/hand-anatomy-40717430>, 53/111.)

Material and methods

In-vitro observations reveal that beyond the extended PIP joint, the lateral bundles maintain dorsal positions. After DIP flexion simultaneous with PIP flexion, the lateral bundles are located in sagittal planes (Van Zwieten et al., 2008). To verify these observations in-vivo, we applied high-resolution ultrasound investigating normal healthy PIP joints (male 58Yrs; female 21Yrs) during extension and flexion. In the finger "the extensor tendons are thin hypoechoic slips on ultrasound. Distally this may be difficult to see." (Allison, 2011). We performed this pilot-study by using Philips iU 22, linear probe, 17 MHz and 5-14 MHz, with a water-based ultrasound gel.

Results

In the extended finger the lateral bundles along the trochlea of the PIP joint are located between frontal and sagittal planes. During PIP flexion, the lateral bundles "tilt" somewhat towards sagittal planes, thus assuming slightly more palmar positions. Because these lateral bundles fuse distally to become the terminal extensor tendon for the DIP joint, they thereby "release" the extended DIP joint, enabling this joint to be flexed as well (Landsmeer, 1979; Tubiana et al., 1996). Then, in subsequent full DIP flexion, the lateral bundles obtain their nearly sagittal positions running along the trochlea of the PIP joint, flexed likewise.

Clinical relevance

These outcome data may be useful in planning and performing extensor tendon repair and reconstruction techniques, e.g. after traumatic hand injuries.

References

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