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# Abstracts

# 42. The extensor assembly of the human finger in interphalangeal flexion

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**Introduction**. In-vivo data about the precise positions of the tendinous lateral bundles (lateral slips or lateral bands) of the extensor assembly of the human finger in proximal interphalangeal (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 …". Meanwhile, there is a unanimity of opinion that "normally, palmar gliding of the lateral bands of the extensor tendon never descends below the transverse axis of the PIP joint." (see http://www.slideshare.net/aminharsh1/hand-anatomy-40717430, 53/111)

**Material and methods**. Anatomical observations reveal that beyond the extended PIP joint, the lateral bundles of the extensor assembly maintain dorsal positions. After DIP flexion simultaneous with PIP flexion, lateral bundles are located in sagittal planes (Van Zwieten et al., 2008). In order to confirm such in-vitro observations in-vivo as well, we applied high-resolution ultrasound to investigate normal healthy PIP joints (male 58Yrs; female 21Yrs) during extension and flexion. In the human finger "the extensor tendons are thin hypoechoic slips on ultrasound. Distally this may be difficult to see." (Allison, 2011). We performed our pilot-study using a 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 without DIP flexion, the lateral bundles "tilt" somewhat towards sagittal planes, assuming slightly more palmar positions. Because the two lateral bundles fuse distally into one terminal extensor tendon for the DIP joint, PIP flexion thus "releases" the extended DIP joint, enabling this joint to be flexed as well (Landsmeer, 1979; Tubiana et al., 1996). Then, in subsequent DIP flexion, the lateral bundles obtain more sagittal and palmar positions along the trochlea of the flexed PIP joint.

**Clinical relevance.** These outcome data may be useful in planning and performing finger extensor tendon repair and reconstruction techniques, e.g. after traumatic hand injuries (Li et al., 2014).