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Publication

Proximal interphalangeal joint volar plate configuration in the crimp grip position

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PURPOSE: To study the configuration of the proximal interphalangeal joint volar plate (VP) in the crimp grip position (metacarpophalangeal joint at 0 degrees to 45 degrees flexion, proximal interphalangeal joint at 90 degrees to 100 degrees flexion, and distal interphalangeal joint at 0 degrees to 10 degrees hyperextension) using magnetic resonance imaging techniques in healthy volunteers and cadaver fingers and to compare the results with histological sections. METHODS: Magnetic resonance imaging was performed on 24 fingers of 8 healthy volunteers and 12 fingers of 4 embalmed cadaver hands in the neutral position and in the crimp grip position. The translation of the VP body relative to the middle phalanx base during finger flexion was measured. In 6 of 12 cadaver specimens, a load of 10 N was applied to the flexor tendons to examine how this would affect the histological VP fiber configuration. RESULTS: When the flexor tendons were under load in the crimp grip position, the volunteers' VP body was translated an average of 3.2 mm, and the cadaver fingers' VP body was translated an average of 3.0 mm, relative to the middle phalanx base in a distal direction. Histological analysis of the crimp grip position revealed reversing fibers in the VP insertion at the base of the middle phalanx when the flexor tendons were under load and the VP body was translated. When no load was applied in the crimp grip position, no translation of the VP body occurred. CONCLUSIONS: This article describes a VP translation in a distal direction relative to the middle phalanx base in the crimp grip position when the flexor tendons are under load. CLINICAL RELEVANCE: A more precise knowledge of the histological properties of the proximal interphalangeal joint VP during finger flexion can be expected to provide greater diagnostic capabilities and can lead to a better comprehension of injuries.
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