

Case Report/Case Series

Tendon Rupture Associated With Excessive Smartphone Gaming

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IMPORTANCE Excessive use of smartphones has been associated with injuries.

OBSERVATIONS A 29-year-old, right hand-dominant man presented with chronic left thumb pain and loss of active motion from playing a Match-3 puzzle video game on his smartphone all day for 6 to 8 weeks. On physical examination, the left extensor pollicis longus tendon was not palpable, and no tendon motion was noted with wrist tenodesis. The thumb metacarpophalangeal range of motion was 10° to 80°, and thumb interphalangeal range of motion was 30° to 70°. The clinical diagnosis was rupture of the left extensor pollicis longus tendon. The patient subsequently underwent an extensor indicis proprius (1 of 2 tendons that extend the index finger) to extensor pollicis longus tendon transfer. During surgery, rupture of the extensor pollicis longus tendon was seen between the metacarpophalangeal and wrist joints.

CONCLUSIONS AND RELEVANCE The potential for video games to reduce pain perception raises clinical and social considerations about excessive use, abuse, and addiction. Future research should consider whether pain reduction is a reason some individuals play video games excessively, manifest addiction, or sustain injuries associated with video gaming.

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Excessive use of smartphones has been associated with injuries, such as BlackBerry thumb.¹ We describe a patient with rupture of the extensor pollicis longus tendon associated with excessive video game play on his smartphone.

Report of a Case

A 29-year-old, right hand-dominant man presented with chronic left thumb pain and loss of active motion. Before the onset of symptoms, he reported playing a video game on his smartphone all day for 6 to 8 weeks. He played with his left hand while using his right hand for other tasks, stating that “playing was a kind of secondary thing, but it was constantly on.” When playing the video game, the patient reported that he felt no pain. He reported no injuries or prior operations to either hand. He denied a history of inflammatory arthritis, quinolone use, or other predisposing medical condition for tendon rupture.

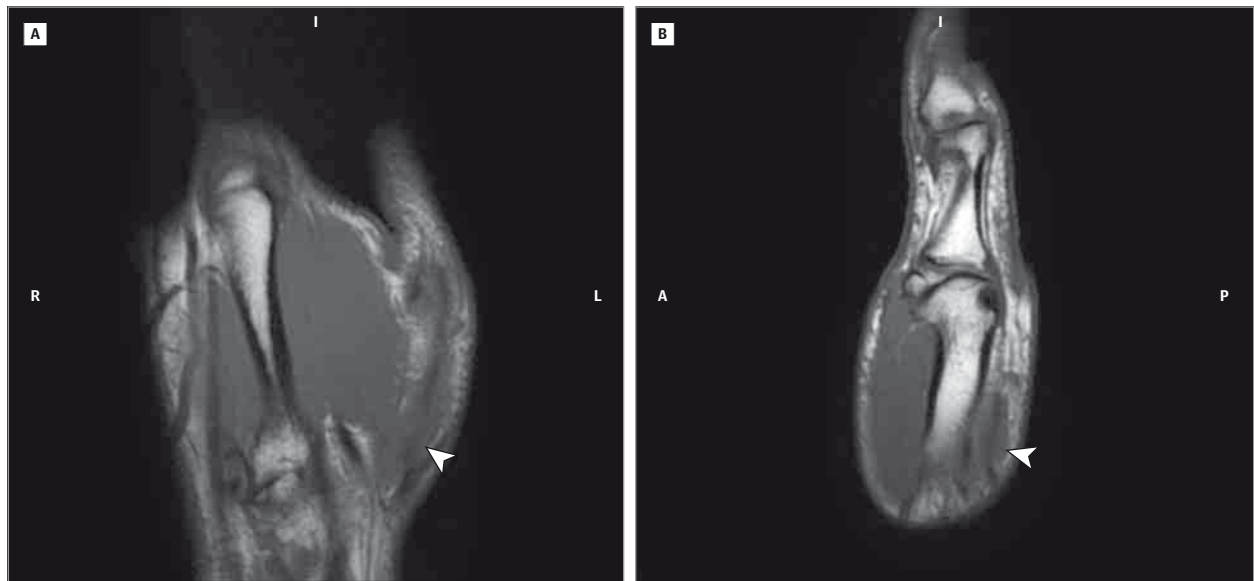
On physical examination, the left extensor pollicis longus tendon was not palpable, and no tendon motion was noted with wrist tenodesis. The thumb metacarpophalangeal range of motion was 10° to 80°, and thumb interphalangeal range of motion was 30° to 70°. The findings on physical examination

of the patient’s right hand were unremarkable. The clinical diagnosis was rupture of the left extensor pollicis longus tendon. A magnetic resonance imaging study of his left hand revealed tendon attenuation and rupture of the tendon (Figure). Radiographic studies of the wrist found no bone spurs or prior or current fractures. The patient subsequently underwent an extensor indicis proprius (1 of 2 tendons that extend the index finger) to extensor pollicis longus tendon transfer. During surgery, rupture of the extensor pollicis longus tendon was seen between the metacarpophalangeal and wrist joints.

Discussion

Video games like that used by this patient allow players to connect with other players through the Internet via social media and smartphones. Players recruit others to play through social media; thus, these video games exhibit several elements that make them highly pleasurable: immersive environments, in-game achievements, and social play.² Pleasure and excitement associated with video games involve physiologic arousal and stimulation of the hypothalamic-pituitary-adrenal axis, resulting in increased heart rate, blood pressure, and sympathetic tone.³

Figure. T1-Weighted Magnetic Resonance Images of the Left Hand



A, Coronal view; B, sagittal view. Arrowheads denote the extensor pollicis longus tendon above the full-thickness tear at the level of the base of the first metacarpal. There is retraction of the proximal tendon fibers. The abductor

pollicis longus and extensor pollicis brevis tendons (not shown in these images) are intact. A indicates anterior; L, left; P, posterior; and R, right.

Video games suppress pain perception in pediatric patients and during burn treatments.^{4,5} Visual distraction and neuroendocrine hypothalamic-pituitary-adrenal arousal provide a plausible explanation for why the patient did not feel pain from his injury. Without the expected physiologic negative pain feedback, excessive gaming may have led to tendon attenuation and subsequent attritional rupture of the tendon. Attritional rupture at the midtendon differs from high-energy ruptures that occur where the tendon is thinnest or between tendon and bone.

Although this is only a single case report, research might consider whether video games have a role in clinical pain management and as nonpharmacologic alternatives during uncomfortable or painful medical procedures. They may also have a role in reducing stress. It may be interesting to ascertain

whether various games differ in their ability to reduce the perception of pain.

Conclusions

The potential for video games to reduce pain perception raises clinical and social considerations about excessive use, abuse, and addiction. Although not a recognized disorder, the editor of the *American Journal of Psychiatry* stated that Internet gaming disorder warranted further research and inclusion in the *DSM-5*.⁶ Research might also consider whether pain reduction is a reason some individuals play video games excessively, manifest addiction, or sustain injuries associated with video gaming.

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