Bilateral Extensor Digitorum Brevis Manus

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abstract

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Dorsal wrist pain and swelling is commonly attributed to a dorsal wrist ganglion. However, based on the authors’ experience, a cautious surgeon should keep the uncommonly symptomatic diagnosis of an extensor digitorum brevis manus in their differential despite classic ganglion presentation and suggestive advanced imaging.

This article describes a case of a young patient who presented with bilateral symptomatic extensor digitorum brevis manus anomalies that required surgical intervention. An extensor digitorum brevis manus is present in 3% of the population in a classic anatomy study from Japan and is most commonly symptomatic with heavy activity and extremes of wrist extension. Anatomically, the extensor digitorum brevis manus is located in the fourth wrist compartment and most commonly inserts on the index finger extensor mechanism. Examination often reveals a spindle-shaped mass that is palpable distal to the extensor mechanism and moves with extensor tendon motion. Magnetic resonance imaging shows a typical dorsal mass distal to the common extensors with a similar signal as muscle with all image sequencing. Treatment includes activity alterations to relieve symptoms or surgical excision of the muscle belly for refractory cases with care taken to preserve the index extensor mechanism.

Figure: T1-weighted axial magnetic resonance image of the muscle belly (asterisk) of the extensor digitorum brevis manus (A). Intraoperative photograph with the muscle belly (asterisk) distal to the extensor retinaculum (X) (B).

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Dorsal wrist pain and swelling is commonly attributable to a dorsal wrist ganglion. This finding is not always true, and the authors suggest that cautious surgeons should keep the uncommon diagnosis of a symptomatic extensor digitorum brevis manus in their differential despite classic ganglion presentation and suggestive advanced imaging.

**Case Report**

A left-hand-dominant 16-year-old girl presented with a painful left dorsal wrist mass and a noncontributory medical history. She was symptomatic with sporting activities and school work when her wrist was in extension. She reported no trauma, constitutional symptoms, or neurologic symptoms. She reported the dorsal wrist pain as a dull, aching pain with no mechanical symptoms of catching, locking, or instability.

Ultrasound revealed an ill-defined mixed echogenic mass on the dorsal wrist with questionable vascular flow. Magnetic resonance imaging suggested a dorsal ganglion originating from the dorsal wrist encompassed by synovitis.

The patient subsequently underwent an attempted in-office aspiration for diagnosis confirmation and local injection for symptomatic relief. No fluid was aspirated in the office. The patient reported subsequent symptomatic relief after the injection and returned to athletic activity.

Seven months after the completion of her athletic season, she returned with recurrence of her previous symptoms. Arthroscopic ganglionectomy with capsulotomy was performed. She recovered well but returned 10 months later with recurrence of previous dorsal wrist symptoms. Subsequent repeat magnetic resonance imaging revealed a dorsal ganglion, with no reference to an extensor digitorum brevis manus.

Excision of the ganglion was performed. Intraoperative findings included a small dorsal ganglion stemming from the midcarpal joint. Also, an extensor digitorum brevis manus was noted in the same anatomical region as the cyst. The extensor digitorum brevis manus muscle belly was excised, and the patient recovered.

Three years postoperatively, the patient returned with similar symptoms on her contralateral dorsal wrist. Magnetic resonance imaging revealed what was read as a dorsal ganglion cyst (Figure). It was suspected based on previous experience that the patient had an extensor digitorum brevis manus anomalous muscle; therefore, open exploration was performed.

Intraoperatively, an extensor digitorum brevis manus was noted and subsequently excised (Figure). The patient has been symptom free bilaterally and has returned to her manual job without limitations. Based on her positive response to extensor digitorum brevis manus excision, the authors believe that much of her original symptomology on the left was related to the extensor digitorum brevis manus.

**Discussion**

It is sometimes clinically difficult to ascertain the relationship between the dorsal ganglion and extensor digitorum brevis manus in creating dorsal wrist pain for a patient. The extensor digitorum brevis manus is an anomalous muscle located in the fourth extensor compartment with relevant clinical implications. Due to its location and typical clinical presentation similar to a dorsal ganglion, it can be misdiagnosed easily. The extensor digitorum brevis manus is present in approximately 3% of the population in a classic anatomy study from Japan, with equal presentation on the right or left hand, and occurs bilaterally in half of patients.1

Ogura et al1 developed a classification system based on the relationship of the extensor digitorum brevis manus with the extensor indicis proprius and the insertion of the extensor digitorum brevis manus. The most common description of the ex-
tensor digitorum brevis manus insertion describes the muscle attaching distally as a single slip into the extensor mechanism of the index finger near the extensor indices.\textsuperscript{1} Distal insertion can also involve the long finger, concomitant long and index fingers, and ring and small fingers.\textsuperscript{1,2} After a dissection of 559 Japanese cadavers, Ogura et al\textsuperscript{1} reported that the extensor digitorum brevis manus most commonly originated from the proximal dorsal radiocarpal ligament, with some specimens showing a connection with the dorsal radius. The extensor digitorum brevis manus can be easily identified intraoperatively because it occupies the fourth dorsal extensor compartment, with its muscle belly extending distal to the extensor retinaculum (Figure).

Clinically, this condition commonly presents as dorsal wrist pain with an associated dorsal fusiform mass that is often mobile with extensor tendon excursion in comparison with a static ganglion cyst. Other clinical signs of a symptomatic extensor digitorum brevis manus include a spindle shape and the presence of a similar mass, symptomatic or asymptomatic, on the contralateral wrist. Previous authors have reported an increased incidence of symptomology in the dominant wrist, with patients often reporting pain with wrist extension and heavy labor activities.\textsuperscript{3,4} It is believed that local irritation on the distal portion of the extensor retinaculum from the active extensor digitorum brevis manus is the likely source of the pain.\textsuperscript{3} Therefore, excision of the accessory muscle belly to decrease the mechanical irritation is often successful in relieving symptoms.\textsuperscript{3,4}

The relative infrequency of a symptomatic occurrence of an extensor digitorum brevis manus muscle makes the clinical diagnosis challenging. A complex relationship may also exist between a dorsal ganglion and a symptomatic extensor digitorum brevis manus.

It is critical for orthopedic surgeons to have knowledge of this dorsal muscle variant and how it can effect their patients. Not all patients with an extensor digitorum brevis manus are symptomatic. One of the most critical preoperative findings in conjunction with a physical examination is a mass with muscle density signal on magnetic resonance imaging distal to the extensor mechanism (Figure). Based on experience, the current authors recommend critical review of diagnostic studies in relationship to dorsal ganglions and the use of a thorough history and physical examination to help delineate the existence of a symptomatic extensor digitorum brevis manus and an isolated dorsal wrist ganglion.

REFERENCES