Extensor indicis proprius syndrome secondary to an anomalous extensor indicis proprius muscle belly

CHRISTOPHER A. REEDER, DO
N. K. PANDEYA, DO

The complaint of dorsal hand pain is common among patients seen in a primary care practice. The differential diagnosis includes tenosynovial disease, ganglion, trauma, and soft-tissue tumors. Rarely is an anomalous muscle an etiologic factor. Reported here is an anomalous indicis proprius muscle that was manifested as a painful dorsal hand mass. Also discussed are the anatomic variations of the extensor indicis proprius syndrome.

(Key words: extensor indicis propius syndrome, anomalous extensor indicis proprius muscle, hand pain, wrist pain, dorsal hand mass)

A rare anomaly of the extensor indicis proprius muscle may be manifested as a painful swelling over the dorsum of the hand. Numerous anatomic variations are reviewed along with a syndrome in which the fourth dorsal compartment is narrowed by aberrant muscle from the extensor indicis proprius muscle.

Report of case

A 21-year-old right-hand-dominant male guitarist had a 2-month history of progressive pain and swelling over the dorsal aspect of the second and third metacarpals of the left hand. Dorsal pain occurred with fingers flexed as he played the guitar. The patient denied having any pain radiating into the fingers or to the forearm.

Radiographs revealed dorsal soft-tissue swelling with no bony involvement. Conservative management with nonsteroidal anti-inflammatory agents and splinting failed to alleviate symptoms.

The patient subsequently underwent exploratory surgery under Bier's local anesthesia. An anomalous muscle belly of the extensor indicis proprius muscle was identified (Fig 1). It extended 4 cm distal to the extensor retinaculum. Normal insertion of the tendon of the extensor digitorum of the index finger was observed. Biopsy of the muscle and synovium demonstrated no evidence of inflammation. The patient's postoperative recovery was uncompli-

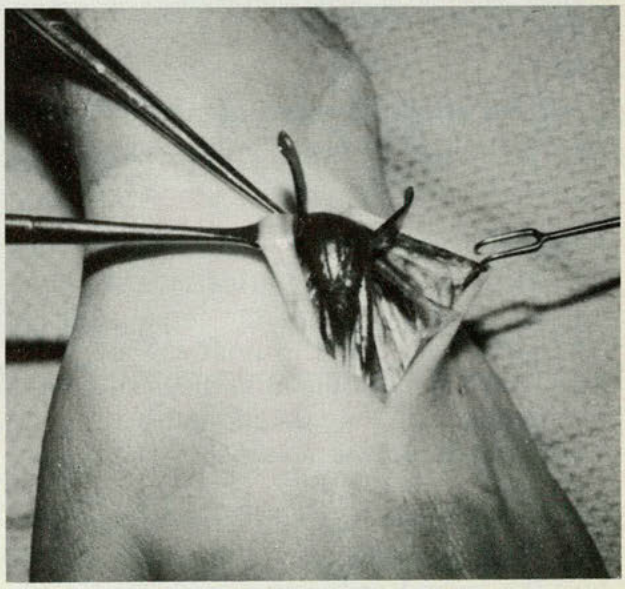


Figure 1. *Anomalous extensor indicis proprius muscle belly distal to transverse carpal ligament. Tendon of the extensor digitorum to the index finger is displaced radially; however, it does lie under the anomalous extensor indicis proprius muscle, on the ulnar aspect of the dorsum of the hand (not shown here).*

At the time this article was written, Dr Reeder was a plastic and reconstructive surgery resident, Plastic Surgery Institute, Des Moines, Iowa. Currently he is doing a hand surgery fellowship, Mercy Hospital, Des Moines. Dr Pandeya is a clinical professor, plastic and reconstructive surgery, University of Osteopathic Medicine and Health Sciences College of Osteopathic Medicine and Surgery, Des Moines.

Reprint requests to Christopher A. Reeder, DO, 410 52nd St, West Des Moines, IA 50265.

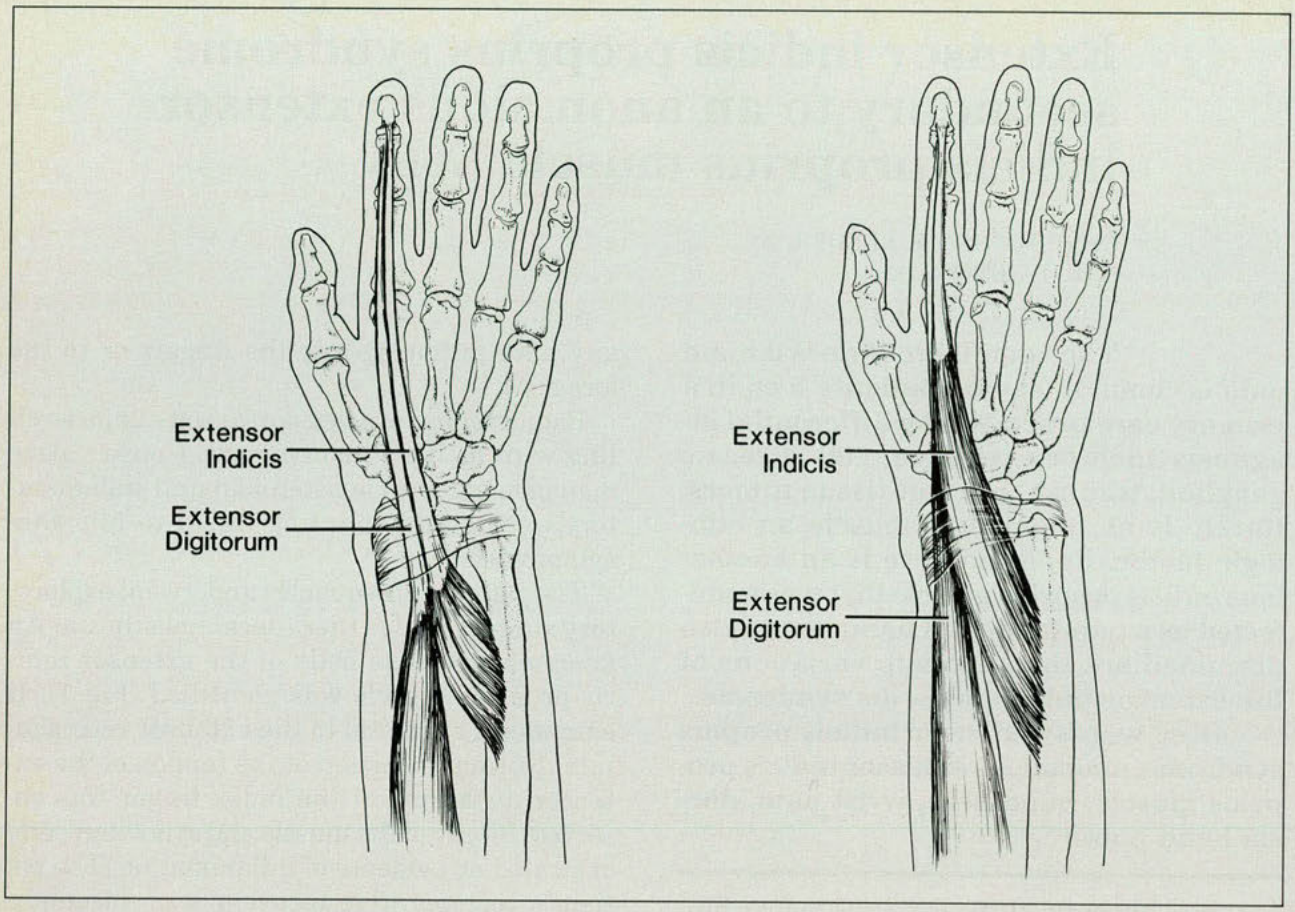


Figure 2. *Left: Normal anatomy in which the extensor indicis proprius becomes tendinous as it passes under the extensor retinaculum.* Right: *Anomalous muscle belly of extensor indicis proprius muscle extending into dorsum of hand.*

cated and, although there had been no specific intervention, the patient became asymptomatic.

Discussion

The extensor indicis proprius muscle classically has its origin along the dorsal aspect of the distal one third of the ulnar and interosseous membrane, just distal to the origin of the extensor pollicis longus. The muscle courses distally, turning tendinous as it travels under the extensor retinaculum (Fig 2, left). Once the tendon passes under the dorsal carpal ligament in the fourth compartment, it crosses over the second metacarpal bone to join the ulnar side of the extensor digitorum of the index finger (Fig 2, right).

Caudwell and colleagues[1] extensively studied anatomic variations of the extensor indicis proprius muscle in 263 consecutive specimens. In their series, 15.6% of the specimens showed evidence of anomalies in either size or origin (or both). However, only three dissections revealed a musculotendinous junction distal to the dorsal extensor retinaculum. The most common location of the musculotendinous junction was within the dorsal compartment (76%).

Ogura and coworkers[2] have suggested that the extensor digitorum brevis manus muscle is a variant of the extensor indicis proprius muscle. Their anatomic investigation of 559 dissected cadavers has demonstrated that the extensor digitorum brevis manus muscle and extensor indicis proprius muscle are most frequently associated together and supplied by the same neurovascular complex (posterior interosseous nerve and posterior branch of the interosseous artery). The origin of the extensor digitorum brevis manus muscle from the

region of the distal radius is not directly adherent to the carpal muscle. The incidence of the extensor digitorum brevis manus has been reported to range from 2% to 10% of dissections.[3]

Pain over the dorsum of the hand is a relatively common presenting complaint. Inflammatory conditions, trauma, soft-tissue masses, and ganglions have been most commonly implicated as the cause. Rarely are anomalous muscles considered in the differential diagnosis. Ritter and Inglis[4] originally described a condition in which pain and tenderness localized over the fourth dorsal compartment was the result of a narrowing in this compartment. This condition might commonly occur with either the fingers flexed, hypertrophy of the muscle belly of the extensor indicis proprius muscle, or local inflammation.

A clinical test developed by Spinner and Olshansky[5] is used to confirm the diagnosis. With the patient's wrist maximally flexed, the metacarpophalangeal joint of the index finger is actively extended against resistance. Localized pain over the region of the fourth dorsal compartment is diagnostic of extensor indicis proprius syndrome.

Conservative treatment with splinting and administration of local steroid injections constitutes initial therapy. If these measures fail, surgical decompression of the fourth dorsal compartment is recommended.

Summary

Dorsal hand pain is a relatively common clinical problem. The most common etiologies are ganglion, tenosynovial disease, trauma, and soft-tissue tumors. In the case described, an anomalous extensor indicis proprius muscle belly extended 4 cm distal to the dorsal retinaculum, causing a painful mass over the dorsum of the left hand.

If a compressive syndrome is suspected, resection of the anomalous muscle belly is indicated. In the patient discussed, surgical decompression alone had been adequate to eradicate the patient's symptoms. An awareness of the rarer presentations of an anomalous indicis proprius muscle belly heightens the clinician's acumen in the evaluation of more difficult diagnostic dilemmas, especially when surgical exploration is undertaken.

The senior author acknowledges Seth Paul, MD, for allowing him to participate in the case reported.

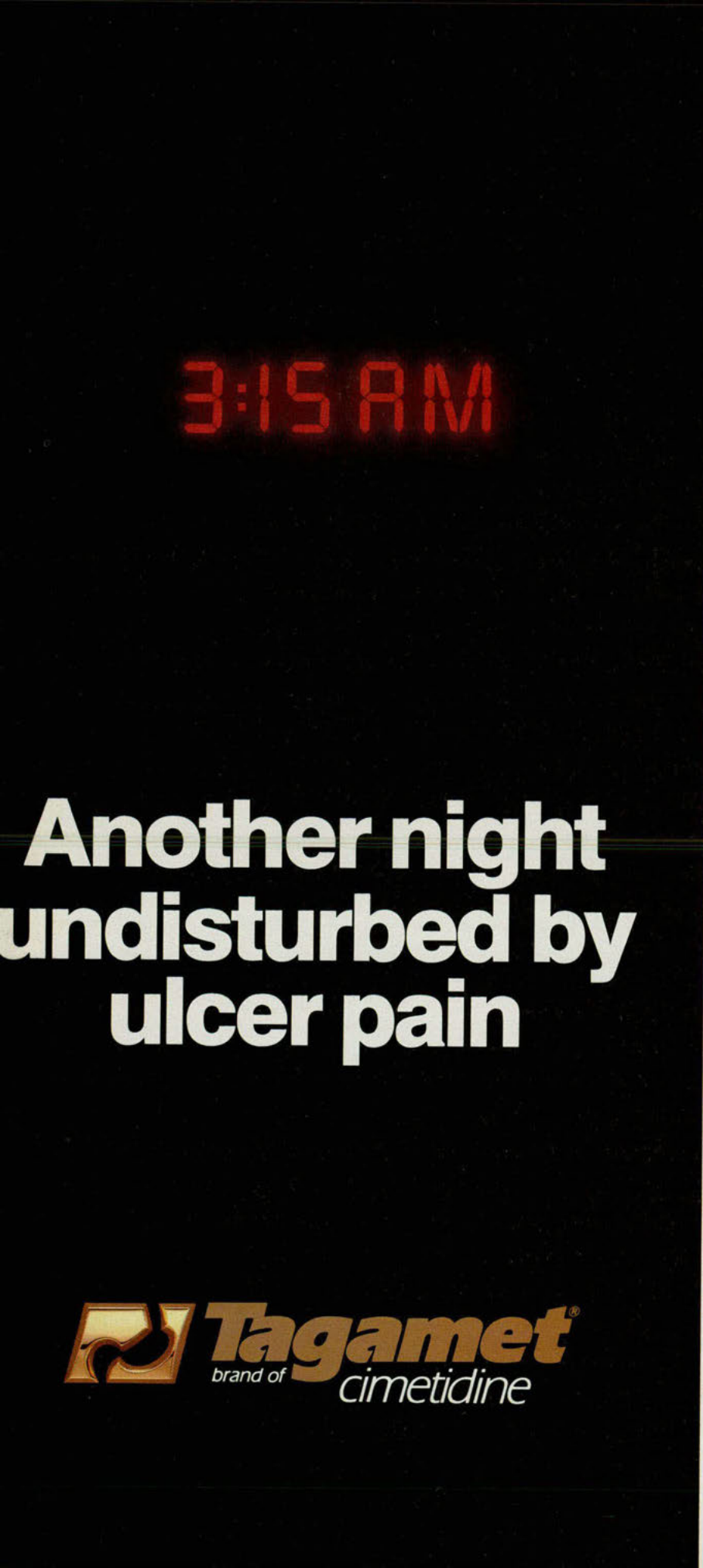
1. Caudwell EW, Anson BJ, Wright RR: The extensor indicis proprius muscle: A study of 263 consecutive specimens. *Quarterly Bulletin of Northwestern University Medical School* 1943;17:267-279.

2. Ogura T, Inove H, Tanabe G: Anatomic and clinical studies of the extensor digitorum brevis manus. *J Hand Surg (Am)* 1987;12:100-107.

3. Murakami Y, Todan K: The extensor indicis brevis muscle with an unusual ganglion. *Clin Orthop* 1982;162:207-209.

4. Ritter WA, Inglis AE; The extensor indicis proprius syndrome. *J Bone Joint Surg (Am)* 1969;51:1645-1648.

5. Spinner M, Olshansky K: The extensor indicis proprius syndrome—A clinical test. *Plast Reconstr Surg* 1973;51:134-138.



Another night undisturbed by ulcer pain

Tagamet® brand of cimetidine

TAGAMET*® *(brand of cimetidine)

See complete prescribing information in SK&F LAB CO. literature or PDR. The following is a brief summary.

Contraindications: *'Tagamet' is contraindicated for patients known to have hypersensitivity to the product.*

Precautions: *Rare instances of cardiac arrhythmias and hypotension have been reported following the rapid administration of 'Tagamet' (brand of cimetidine hydrochloride) injection by intravenous bolus.*

Symptomatic response to 'Tagamet' therapy does not preclude the presence of a gastric malignancy. There have been rare reports of transient healing of gastric ulcers despite subsequently documented malignancy.

Reversible confusional states have been observed on occasion, predominantly in severely ill patients.

'Tagamet' has been reported to reduce the hepatic metabolism of warfarin-type anticoagulants, phenytoin, propranolol, chlordiazepoxide, diazepam, certain tricyclic antidepressants, lidocaine, theophylline and metronidazole. Clinically significant effects have been reported with the warfarin anticoagulants; therefore, close monitoring of prothrombin time is recommended, and adjustment of the anticoagulant dose may be necessary when 'Tagamet' is administered concomitantly. Interaction with phenytoin, lidocaine and theophylline has also been reported to produce adverse clinical effects.

However, a crossover study in healthy subjects receiving either 'Tagamet' 300 mg q.i.d. or 800 mg h.s. concomitantly with a 300 mg b.i.d. dosage of theophylline (Theo-Dur®, Key Pharmaceuticals, Inc.) demonstrated less alteration in steady-state theophylline peak serum levels with the 800 mg h.s. regimen, particularly in subjects aged 54 years and older. Data beyond ten days are not available. (Note: All patients receiving theophylline should be monitored appropriately, regardless of concomitant drug therapy.)

In a 24-month toxicity study in rats, at dose levels approximately 8 to 48 times the recommended human dose, benign Leydig cell tumors were seen. These were common in both the treated and control groups, and the incidence became significantly higher only in the aged rats receiving 'Tagamet'.

A weak antiandrogenic effect has been demonstrated in animals. In human studies, 'Tagamet' has been shown to have no effect on spermatogenesis, sperm count, motility, morphology or in vitro fertilizing capacity.

Pregnancy Category B: Reproduction studies have been performed in rats, rabbits and mice at doses up to 40 times the normal human dose and have revealed no evidence of impaired fertility or harm to the fetus due to 'Tagamet'. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproductive studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Lack of experience to date precludes recommending 'Tagamet' for use in children under 16 unless anticipated benefits outweigh potential risks; generally, nursing should not be undertaken by patients taking the drug since cimetidine is secreted in human milk.

Adverse Reactions: *Diarrhea, dizziness, somnolence, headache. Reversible confusional states [e.g., mental confusion, agitation, psychosis, depression, anxiety, hallucinations, disorientation], predominantly in severely ill patients, have been reported. Reversible impotence in patients with pathological hypersecretory disorders receiving 'Tagamet', particularly in high doses for at least 12 months, has been reported. The incidence of impotence in large-scale surveillance studies at regular doses has not exceeded that commonly reported in the general population. Gynecomastia has been reported in patients treated for one month or longer. Decreased white blood cell counts in 'Tagamet'-treated patients [approximately 1 per 100,000 patients], including agranulocytosis [approximately 3 per million patients], have been reported, including a few reports of recurrence on rechallenge. Most of these reports were in patients who had serious concomitant illnesses and received drugs and/or treatment known to produce neutropenia. Thrombocytopenia [approximately 3 per million patients] and, very rarely, cases of aplastic anemia have also been reported. Increased serum transaminase has been reported. Reversible adverse hepatic effects, cholestatic or mixed cholestatic-hepatocellular in nature, have been reported rarely. Because of the predominance of cholestatic features, severe parenchymal injury is considered highly unlikely. A single case of biopsy-proven periportal hepatic fibrosis in a patient receiving 'Tagamet' has been reported. Increased plasma creatinine has been reported. Rare cases of fever, interstitial nephritis, urinary retention, pancreatitis and allergic reactions, including anaphylaxis and hypersensitivity vasculitis, have been reported. Rare cases of bradycardia, tachycardia and A-V heart block have been reported with H_2-receptor antagonists. Reversible arthralgia, myalgia and exacerbation of joint symptoms in patients with pre-existing arthritis have been reported rarely. Rare cases of polymyositis have been reported, but no causal relationship has been established. Mild rash and, very rarely, cases of severe generalized skin reactions [e.g., Stevens-Johnson syndrome, epidermal necrolysis, erythema multiforme, exfoliative dermatitis and generalized exfoliative erythroderma] have been reported with H_2-receptor antagonists. Reversible alopecia has been reported very rarely.*

How Supplied: Tablets: *200 mg tablets in bottles of 100; 300 mg tablets in bottles of 100 and Single Unit Packages of 100 [intended for institutional use only]; 400 mg tablets in bottles of 60 and Single Unit Packages of 100 [intended for institutional use only], and 800 mg Tiltab® tablets in bottles of 30 and Single Unit Packages of 100 [intended for institutional use only].*

Liquid: *300 mg/5 mL, in 8 fl oz (237 mL) amber glass bottles and in single-dose units (300 mg/5 mL), in packages of 10 [intended for institutional use only].*

Injection:
Vials: *300 mg/2 mL in single-dose vials, in packages of 10 and 30, and in 8 mL multiple-dose vials, in packages of 10 and 25.*

Prefilled Syringes: *300 mg/2 mL in single-dose prefilled disposable syringes.*

Single-Dose Premixed Plastic Containers: *300 mg in 50 mL of 0.9% Sodium Chloride in single-dose plastic containers, in packages of 4 units. No preservative has been added.*

Exposure of the premixed product to excessive heat should be avoided. It is recommended the product be stored at controlled room temperature. Brief exposure up to 40°C does not adversely affect the premixed product.

ADD-Vantage® Vials: *300 mg/2 mL in single-dose ADD-Vantage® Vials, in packages of 25.*

'Tagamet' (brand of cimetidine hydrochloride) injection premixed in single-dose plastic containers is manufactured for SK&F Lab Co. by Baxter Healthcare Corporation, Deerfield, IL 60015.

BRS-TG:L80B *Date of issuance Oct. 1989*

SK&F LAB CO.
Cidra, P.R. 00639