

## EVIDENCE SUMMARY

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# Infected Flexor Sheath (Pyogenic Flexor Tenosynovitis)

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## Overview

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- Pyogenic flexor tenosynovitis is an uncommon closed-space infection of the hand [2].
- Pyogenic flexor tenosynovitis can result in severe stiffness and other sequela [2].
- Acute flexor tendon sheath infections are associated with significant morbidity [3].
- 43% of patients with acute flexor tendon sheath infections have a poor result [3].
- The consequences of pyogenic flexor tenosynovitis can include destruction of the tendon sheath [6].
- The consequences of pyogenic flexor tenosynovitis can include scarring and inflammation causing oedema of the soft tissues of the finger [6].
- The consequences of pyogenic flexor tenosynovitis can include resultant finger stiffness [6].
- The consequences of pyogenic flexor tenosynovitis can occasionally include compartment syndrome [6].
- Sonographic evidence of a swollen tendon and fluid in the flexor sheath correlates strongly with the diagnosis of acute suppurative tenosynovitis [4].
- Sonographic evidence of a swollen tendon and fluid in the flexor sheath should prompt early surgical drainage [4].
- Any suspicion of flexor tendon sheath phlegmon should lead to urgent surgical exploration [10].
- Any suspicion of flexor tendon sheath phlegmon should not lead to blind antibiotic prescription [10].
- The absence of pain on passive extension in advanced stages is a grave prognostic sign indicating tissue necrosis rather than improvement [7].

## Anatomy & Pathophysiology

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### FLEXOR TENDON ANATOMY AND SHEATH STRUCTURE

- The extrinsic finger flexors consist of the flexor digitorum profundus and the flexor digitorum superficialis [13].
- The flexor digitorum profundus inserts on the proximal volar aspect of the distal phalanx, flexing the distal interphalangeal joint as well as the proximal interphalangeal and metacarpophalangeal joints [13].

- The flexor digitorum superficialis acts as a flexor of the proximal interphalangeal and metacarpophalangeal joints [13].
- As flexor tendons pass distal to the metacarpal neck, they enter the fibroosseous tunnel, or digital flexor sheath [24].
- The fibroosseous tunnel extends distally to the proximal aspect of the distal phalanx [24].
- The tendinous sheath consists of annular pulleys, which provide mechanical stability, and cruciate pulleys, which provide flexibility [24].
- The first, third, and fifth annular pulleys (A1, A3, and A5) are located over the metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints, respectively [24].
- The second and fourth pulleys (A2 and A4) are situated over the middle portion of the proximal and middle phalanges [24].
- The A2 and A4 pulleys are the most essential in maintaining the mechanical advantage of the flexor tendons [24].
- The tenosynovium that lines the fibroosseous tunnel supplies both nutrition and lubrication to the poorly vascularized flexor tendons [24].
- Within the sheath, tendon vascularity is supplied via the vincula system: the vinculum longus and brevis [24].
- The tenosynovial sheath of the flexor pollicis longus is continuous with the radial bursa [24].
- The tenosynovial sheath to the little finger is continuous with the ulnar digital bursa [24].
- In some patients, the radial and ulnar bursae communicate, allowing a so-called horseshoe abscess to spread between the thumb and little finger if infection occurs in the flexor tendon sheath of either one of these digits [24].

## PATHOPHYSIOLOGY OF PYOGENIC FLEXOR TENOSYNOVITIS

- Pyogenic flexor tenosynovitis (PFT) is an uncommon closed-space infection of the hand that can result in severe stiffness and other sequelae [2].
- Acute flexor tendon sheath infections are associated with significant morbidity, with 43% of patients having a poor result [3].
- The consequences of pyogenic flexor tenosynovitis can be destruction of the tendon sheath, scarring and inflammation causing oedema of the soft tissues of the finger with resultant finger stiffness or, occasionally, compartment syndrome [6].
- Sonographic evidence of a swollen tendon and fluid in the flexor sheath correlates strongly with the diagnosis of acute suppurative tenosynovitis and should prompt early surgical drainage [4].
- Any suspicion of flexor tendon sheath phlegmon should lead to urgent surgical exploration, not blind antibiotic prescription [10].
- Although unusual, nonsuppurative tenosynovitis secondary to foreign body migration may occasionally account for an otherwise unexplained mild but persistent tenosynovitis [11].

## Classification

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- Nonsuppurative tenosynovitis secondary to foreign body migration may occasionally account for an otherwise unexplained mild but persistent tenosynovitis [11].

## Investigations

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- A careful physical examination is essential to direct care and future testing if indicated [12].
- Diagnostic tests such as imaging and serum laboratory studies are useful in the determination of pathology but can be expensive, time consuming, and often nonspecific [12].

## Treatment

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### OPERATIVE

- A minimally invasive, ultrasound-guided, percutaneous flexor tendon sheath lavage technique was effective in 65% of cases [1].
- A minimally invasive, ultrasound-guided, percutaneous flexor tendon sheath lavage technique was safe in 100% of cases [1].
- Any suspicion of flexor tendon sheath phlegmon should not be managed with blind antibiotic prescription [10].
- Placement of irrigation catheters in ulnar or radial bursitis may be facilitated by passing an irrigation catheter over a previously placed guide wire [9].

### OUTCOMES AND PROGNOSIS

- No patient had a recurrence of the infection following closed tendon sheath irrigation for pyogenic flexor tenosynovitis [5].
- Use of a protocol for the treatment of severe infections of the hand resulted in a shorter hospital stay compared with patients treated before the protocol's institution [8].
- Use of a protocol for the treatment of severe infections of the hand resulted in faster healing compared with patients treated before the protocol's institution [8].
- Use of a protocol for the treatment of severe infections of the hand resulted in fewer complications, including recrudescence of infection, reoperation, stiffness, arthritis, and osteomyelitis, compared with patients treated before the protocol's institution [8].

## Complications

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- Pyogenic flexor tenosynovitis is an uncommon closed-space infection of the hand that can result in severe stiffness and other sequela [2].
- Complications associated with severe hand infections include recrudescence of infection, reoperation, stiffness, arthritis, and osteomyelitis [8].

## Recovery

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- The consequences of pyogenic flexor tenosynovitis can be destruction of the tendon sheath [6].
- The consequences of pyogenic flexor tenosynovitis can be scarring and inflammation causing oedema of the soft tissues of the finger with resultant finger stiffness [6].
- The consequences of pyogenic flexor tenosynovitis can occasionally be compartment syndrome [6].
- Use of a treatment protocol resulted in a shorter hospital stay compared with patients treated before the protocol's institution [8].
- Use of a treatment protocol resulted in faster healing compared with patients treated before the protocol's institution [8].
- Use of a treatment protocol resulted in fewer complications, including recrudescence of infection, reoperation, stiffness, arthritis, and osteomyelitis, compared with patients treated before the protocol's institution [8].
- No patient had a recurrence of the infection following closed tendon sheath irrigation [5].

## Key Evidence

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- [L5] Our results have shown that this minimally invasive, ultrasound-guided, percutaneous flexor tendon sheath lavage technique was effective in 65% of cases and safe in 100% of cases. [1] ([10.1016/j.hansur.2018.12.001](#))
- [L5] Pyogenic flexor tenosynovitis (PFT) is an uncommon closed-space infection of the hand that can result in severe stiffness and other sequela. [2] ([10.2106/jbjs.rvw.26.00015](#))
- [L4] Acute flexor tendon sheath infections are associated with significant morbidity, with 43% of patients having a poor result. [3] ([10.1016/0363-5023\(90\)90064-x](#))
- [L4] Sonographic evidence of a swollen tendon and fluid in the flexor sheath correlates strongly with the diagnosis of acute suppurative tenosynovitis and should prompt early surgical drainage. [4] ([10.1016/0363-5023\(89\)90027-0](#))
- [L4] No patient had a recurrence of the infection. [5] ([10.1016/s0363-5023\(78\)80141-5](#))
- [L5] The consequences of pyogenic flexor tenosynovitis can be destruction of the tendon sheath, scarring and inflammation causing oedema of the soft tissues of the finger with resultant finger stiffness or, occasionally, compartment syndrome. [6] ([10.1016/j.jhsb.2006.02.019](#))

- [L3] The absence of pain on passive extension in advanced stages is a grave prognostic sign indicating tissue necrosis rather than improvement. [7] ([10.1016/j.injury.2026.113631](https://doi.org/10.1016/j.injury.2026.113631))
- [L3] Use of the protocol resulted in a shorter hospital stay, faster healing, and fewer complications (recrudescence of infection, reoperation, stiffness, arthritis, and osteomyelitis) when compared with 107 patients who were treated before institution of the protocol. [8] ([10.1016/s0363-5023\(88\)80060-1](https://doi.org/10.1016/s0363-5023(88)80060-1))
- [L5] Placement of irrigation catheters in other closed space infections such as in ulnar or radial bursitis may also be facilitated by passing an irrigation catheter over a previously placed guide wire. [9] ([10.1016/s0266-7681\(97\)80290-2](https://doi.org/10.1016/s0266-7681(97)80290-2))
- [L4] Any suspicion of flexor tendon sheath phlegmon should lead to urgent surgical exploration, not blind antibiotic prescription. [10] ([10.1016/j.main.2011.10.025](https://doi.org/10.1016/j.main.2011.10.025))
- [L5] Although unusual, the situation described may occasionally account for an otherwise unexplained mild but persistent tenosynovitis. [11] ([10.1016/s0363-5023\(83\)80176-2](https://doi.org/10.1016/s0363-5023(83)80176-2))

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