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## Case Report

## Isolated Gonococcal Extensor Tenosynovitis

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*Neisseria gonorrhoeae* is a mucosal infection that has the propensity to disseminate, causing symptoms that commonly include arthralgias, skin lesions, fevers, chills, dysuria, genital discharge, septic arthritis, and/or tenosynovitis. Typically, gonococcal tenosynovitis affects the flexor sheath and is associated with arthralgias, skin lesions, or both. To the best of our knowledge, there has not been a documented case of isolated gonococcal extensor tenosynovitis. We report the case of a 16-year-old boy with isolated left upper-extremity gonococcal extensor tenosynovitis who was successfully treated with surgical debridement and antibiotic therapy.

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Gonococcal infection is caused by an obligate human pathogen, *Neisseria gonorrhoeae*, which colonizes the mucosal epithelium.<sup>1</sup> The primary site of infection is most often the genitourinary tract. In about 1% to 3% of cases, the bacteria invade the bloodstream, causing a disseminated gonococcal infection (DGI).<sup>1,2</sup> The presentation of DGI commonly involves arthralgias, skin lesions, fevers, chills, dysuria, genital discharge, septic arthritis, and/or tenosynovitis.<sup>2</sup> Typically, tenosynovitis affects the flexor sheath and presents with other DGI symptoms.<sup>2–7</sup> In contrast, it rarely involves the extensor sheath and infrequently presents in isolation.<sup>2–7</sup> To our knowledge, there are no reports of an isolated gonococcal extensor tenosynovitis. We present the case of a boy with an isolated extensor tenosynovitis caused by a gonococcal infection.

## Case Report

A 16-year-old, left-handed, 11th-grade boy presented to the office with a 12-day history of isolated left wrist pain. He described the insidious onset of diffuse wrist pain, with no preceding trauma. He denied any cuts, abrasions, or bites. His medical history included mild asthma and attention-deficit hyperactive disorder, with no family history of inflammatory arthritis. Furthermore, he denied a history of using intravenous drugs, alcohol, or tobacco. He reported

1 previous sexual partner; this single episode had occurred within the year before presentation. His review of systems was negative, specifically without dysuria or penile discharge.

One week after the onset of pain and 5 days before presentation to the office, the patient had gone to the emergency department (ED). In the ED, wrist radiographs were taken and revealed no fractures, osseous abnormalities, periarticular erosions, or effusion. The patient was placed in a volar wrist orthosis and discharged home. The patient returned to the ED the following day owing to progressively worsening pain. At this visit, laboratory values revealed an elevated white blood cell count (WBC) of 13.0 and an elevated C-reactive protein level of 17.5 (normal, <0.5). The patient's temperature was mildly elevated at 100.2°F. Once again, the patient was discharged home with an orthosis and the recommendation for orthopedic follow-up.

Upon initial examination in the office, the patient had full range of motion (ROM) of the shoulder and elbow. He held the wrist in slight flexion and was extremely guarded. There was minimal wrist swelling with no erythema involving the left upper extremity. The patient had exquisite pain with motion of the wrist and with any finger ROM (passive or active). However, he was able to tolerate micro-motion of the wrist. The patient held all of the fingers in a flexed posture and refused to extend them actively. Palpation revealed extreme tenderness throughout the dorsal aspect of the wrist both proximal and distal to the radiocarpal joint. The wrist had less tenderness with radioulnar palpation and no tenderness with volar palpation. The hand was neurovascularly intact with good finger perfusion. Wrist radiographs were repeated in the office and again revealed no fractures, osseous abnormalities, periarticular erosions, or effusion.

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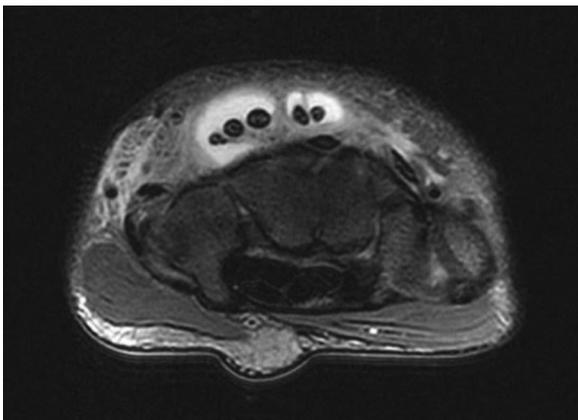
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Based on the severe pain and concern for infection, the patient was sent to the ED for urgent laboratory work and magnetic resonance imaging (MRI). The laboratory results revealed an elevated WBC of 11.2, elevated C-reactive protein level of 49.9 (normal, <0.5), and elevated erythrocyte sedimentation rate of 48 (normal, <20). Rheumatoid factor, antinuclear antibody test, and Lyme titer were negative. An MRI with and without contrast demonstrated diffuse extensor tenosynovitis without radiocarpal, midcarpal, or distal radioulnar joint effusion (Fig. 1). Given these findings, the patient was taken to the operating room for urgent irrigation and debridement. Exploration revealed diffuse extensor tenosynovitis with substantial cloudy tenosynovial fluid; a radical extensor tenosynovectomy was performed. Specimens were sent for both cultures and pathology. We decided not to enter the radiocarpal midcarpal or distal radioulnar joints because of the lack of effusion upon MRI. After surgery, the patient was admitted to the hospital, vancomycin was started empirically, and the infectious disease department (ID) was consulted. Final cultures grew *N gonorrhoeae*. Because of the positive surgical cultures, no additional gonorrhea testing (urine or genital cultures) was performed. Based on the infectious disease department's recommendations, antibiotics were changed to ceftriaxone for a total of 4 weeks and the patient was discharged after 3 days with a peripherally inserted central catheter. Upon discharge, his WBC had normalized to 7.0 and the pain had dissipated.

At the routine follow-up, the patient's wound had healed without incident. Because of his initial finger and wrist stiffness, hand therapy was prescribed. Ten weeks after surgery, he had no pain with full finger and wrist ROM that was symmetric to the contralateral side.

**Discussion**

Tenosynovitis is an infection of the tendon sheath that is typically associated with an inciting event or trauma that results in direct inoculation of the pathogen into the sheath. In rare situations, the tendon sheath can be inoculated indirectly by pathogens within the bloodstream. *Neisseria gonorrhoeae* is a prime example of such a pathogen, which can cause multivisceral symptoms by way of hematologic spread. Disseminated gonococcal infection can initially be asymptomatic or it may be present in the bacteremic stage with symptoms of fevers, chills, skin lesions, arthralgias, and tenosynovitis. These symptoms typical resolve within a week and then arthritis begins to develop.<sup>8</sup> Localized septic arthritis occurs in approximately 40% of DGI infections.<sup>9</sup> In some instances, DGI can deviate from such a course, in which patients may present with arthritis or tenosynovitis alone.<sup>6</sup>



**Figure 1.** Magnetic resonance image of extensor tenosynovitis: left hand axial T2 MRI displaying diffuse inflammation surrounding the extensor tendons.

Although gonococcal tenosynovitis typically presents in patients with DGI, multiple case reports describe isolated gonococcal flexor tenosynovitis in the absence of other DGI symptoms.<sup>2,5–8</sup> However, no case reports exist of isolated gonococcal extensor tenosynovitis. In fact, gonococcal extensor tenosynovitis is extremely rare. To our knowledge, only 2 cases reports document such pathology.<sup>3,4</sup> However, each was associated with other DGI symptomatology. In 1976, Colin and Weissmann<sup>3</sup> reported the case of a 36-year-old woman with extensor tenosynovitis accompanied by dermatitis and arthralgias to both her ankles and elbows with a positive cervical culture for *N gonorrhoeae* that was successfully treated with erythromycin.<sup>3</sup> In 2003, Craig et al<sup>4</sup> reported the case of a 17-year-old girl with extensor tenosynovitis accompanied by a contralateral shoulder septic arthritis with culture fluid positive for *N gonorrhoeae*.<sup>4</sup> However, treatment and management were not discussed.<sup>4</sup>

In this case, the patient presented with extensor tenosynovitis in the absence of common signs and symptoms of DGI. Furthermore, aside from his age, the patient had no other risk factors for gonorrhea, such as female gender, young age (15–25 years), pregnancy, asymptomatic mucosal infection, low socioeconomic status, multiple sexual partners, complement deficiency, intravenous drug abuse, human immunodeficiency virus infection, or systemic lupus erythematosus.<sup>1,2,5,6,8</sup> Because of the potential for such an innocuous presentation, a high index of suspicion is required. Any concern warrants a thorough workup with culture samples obtained from all possible sites including blood, synovial fluid, skin lesions, endocervix, urethra, rectum, and pharynx. Unfortunately, blood and synovial cultures are positive in only 20% to 30% of DGI, whereas urethral cultures are positive in 50% to 75% of men and cervical cultures are positive in approximately 90% of women.<sup>2,8</sup>

Gonococcal tenosynovitis treatment should consist of surgical irrigation and debridement, with antibiotic therapy. The initial antibiotic recommendation is a third-generation cephalosporin (ie, ceftriaxone) 1 g intramuscularly or intravenously every 24 hours or cefotaxime or ceftizoxime 1 g intravenously every 8 hours. For patients who are allergic to β-lactam drugs, spectinomycin 2 g intramuscularly every 12 hours is the treatment of choice. After completing 24 to 48 hours of intravenous therapy and demonstrating clinical improvement, patients begin oral therapy with cefixime 400 mg or ciprofloxacin 500 mg twice daily for 1 week.<sup>8</sup>

Gonococcal extensor tenosynovitis is uncommon, especially with no associated DGI symptoms. Although isolated gonococcal extensor tenosynovitis is rare, it should be included in the differential diagnosis of isolated tenosynovitis, in particular when treating a sexually active patient.

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