

Tenosynovitis Caused by a *Pseudallescheria boydii* Infection and Symptoms of Reflex Sympathetic Dystrophy After a Dog Bite

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Abstract: Tenosynovitis caused by a *Pseudallescheria boydii* infection is an extremely rare complication after a dog bite and is easily misdiagnosed, leading to a delay in treatment. Careful history taking and adequate cultures can lead to a timely diagnosis, and longstanding antimycotic treatment can successfully eradicate the fungus.

Key Words: tenosynovitis, reflex sympathetic dystrophy, *Pseudallescheria boydii*, dog bite

(*J Clin Rheumatol* 2011;17: 363–364)

Animal bite wounds are commonly seen of which the majority occur in young children. In adults, the extremities are the most frequent site of injury. Bite wounds may lead to local symptoms including damage to musculotendinous units, neurovascular structures, bones, and joints. Occasionally, they may lead to damage to a limb, permanent disability, or amputation. Also, systemic symptoms may occur.

These wounds may be complicated by infection, and the isolates recovered from cultures of dog bite wounds are usually complex and result from a mixture of organisms representing the resident flora of the animal. *Pasteurella* species are the most common isolate, but also *Staphylococcus aureus*, hemolytic streptococci, gram-negative rods, and a number of anaerobic microorganisms are frequently isolated. Normally, these wounds heal within weeks when adequate care is provided, whereas long-term infectious sequelae are extremely rare. The first step in caring for a bite is wound care, and antibiotics should be considered therapeutic, not prophylactic, in normally healthy persons.¹

This article reviews the case of a dog bite in an adult's lower arm that illustrates a rare infectious complication.

CASE

A 63-year-old man presented at the Department of Anesthesiology of our hospital because of repetitive swelling, tenderness, and pain at the palmar side of his right lower arm proximally to the wrist and paresthesia in a few fingers with some muscle weakness for almost 1 year. No fever was present. He had no medical history and no abuse of alcohol, and he used no immunosuppressive medication. Because of the suspicion of reflex sympathetic dystrophy, the patient had been admitted to the hospital for treatment with mannitol infusions by the anesthesiologist.

Several attempts with local treatment of the intermittently painful and somewhat swollen forearm with dimethyl sulfoxide weeks after the dog bite were unsuccessful. After treatment failure of mannitol infusions, the patient was referred to the rheumatologist. A careful history revealed a dog bite in the same arm 1 year before current presentation.

Physical examination revealed a soft tissue swelling present at the volar side just proximal of the right wrist, 2 × 4 cm in size, painful at palpation with a diffuse swelling of the hand and wrist region. Besides, there were signs of median nerve compression with diminished sensation in the median nerve distribution and some muscle weakness. The Hoffman-Tinel sign was negative; no signs of arthritis were present, nor were there any skin changes. Body temperature was 36.9°C.

Laboratory findings showed a C-reactive protein of 12 mg/L (reference range, 0–10 mg/L) and a leukocyte count of 5.4 × 10.9/L (reference range, 4–11/L) with a normal differential. Rheumatoid factor was 5.0 (reference, <20 U/mL).

X-ray of the right forearm and hand showed signs of some osteophyte formation at the distal interphalangeal joint 2 and distal interphalangeal joint 3. No abnormalities of the carpal bones or the radius or ulna were seen.

Ultrasonography showed an effusion at the volar side of the wrist around the finger flexor tendons (Fig.). Sonographically guided fluid aspiration revealed 0.5 mL slightly turbid fluid. Gram stain showed no bacteria, and the cultures demonstrated no growth of bacteria. No leukocyte count was not done.

With initial diagnosis of sterile tenosynovitis with carpal tunnel syndrome, the patient was treated with a nonsteroidal anti-inflammatory drug and local intrasynovial corticosteroid injection at the flexor tendons region, with a short and insufficient response. Because of the insufficient response and the history of a dog bite, a second culture was taken, and again no bacterial growth was observed, but after extended incubation time, both cultures finally showed numerous colonies of *Pseudallescheria boydii*. Antifungal therapy with voriconazole in the maximally tolerated dose of 200 mg twice daily was started, resulting in a decrease of pain and swelling and resolution of the symptoms of the carpal tunnel syndrome within 3 weeks. The course was complicated by a rupture of the flexor tendon of the index finger. The patient refused surgical therapy. After 6 months of treatment, voriconazole was stopped, but the symptoms and signs of tenosynovitis recurred within 2 weeks. A culture of aspirated fluid revealed no fungus this time. Nevertheless, treatment with voriconazole was reinstated with promptly ensuing disappearance of all signs and symptoms. Notwithstanding a generalized UV-provoked rash, the patient was able to complete 1 year of treatment. To date, 10 months after stopping voriconazole, there are no signs of recurrence.

DISCUSSION

Our patient presented with a flexor tenosynovitis and symptoms of carpal tunnel syndrome 1 year after a dog bite caused by

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The authors declare no conflict of interest.

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ISSN: 1076-1608/11/1707-0363

DOI: 10.1097/RHU.0b013e31823279dd



FIGURE. Ultrasonography at the volar side of the wrist: it shows an increased synovial proliferation around the finger flexor tendons. *Hypoechoic areas compatible with synovial proliferation and turbid fluid. →Increased number of blood vessels suggesting inflammatory hyperemia. #Finger flexor tendons.

a *P. boydii* infection. Initially, he was referred to the anesthesiologist and treated for reflex sympathetic dystrophy. However, after a carefully taken history, ultrasonographic examination, and a repeated culture of aspirated fluid, patient was diagnosed as having a flexor tenosynovitis caused by *P. boydii* and was successfully treated with voriconazole during 1 year.

Mycotic infections of bones and joints are extremely rare. They are seen most commonly in patients with predisposing factors that depress the immune system such as alcoholism, cancer, treatment with corticosteroids or cytotoxic drugs, and prolonged use of intravenous antibiotics. These infections usually follow a chronic indolent course of several months, leading to delay in diagnosis and incorrect treatments.²

Pseudallescheria boydii is a saprophytic fungus commonly found in soil and water. Cutaneous disease is the most common manifestation,³ and only a few cases of *P. boydii* arthritis have been reported, typically affecting the knee after minor trauma.⁴ Also after animal bites, infections with *P. boydii* are very rare. Clinical features of joint infection include pain, erythema, swelling, and decreased range of motion. Systemic symptoms, including fever, are often absent. The interval between the contamination and the onset of symptoms ranges from 4 days to 14 months.⁴ Treatment is not well defined, and a combination of both medical and surgical treatments is frequently necessary in the management of infection with this microorganism. A precise identification of the fungus is needed to accurately guide the antimycotic treatment. *Pseudallescheria boydii* is most responsive to the imidazoles such as voriconazole, but the optimal choice and duration of therapy are unknown, and antifungal susceptibility testing of the isolate can be useful to guide the choice of therapy.^{5–7} Treatment failure is common as a result of drug interactions, adverse effects, or relapse of infection after discontinuation of treatment. Surgical debridement, excision of

involved bones, and amputation are adjunctive therapeutic approaches that are used in severe cases. Notwithstanding 6 months of treatment with voriconazole, the signs and symptoms of infection recurred in our patient. Only after therapy for another 12 months, the infection was really cured as demonstrated by absence of clinical symptoms 10 months after stopping antifungal therapy.

CONCLUSION

Tenosynovitis after a dog bite caused by *Pseudallescheria boydii* is easily misdiagnosed.

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