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## Case Report

# Methicillin-resistant *Staphylococcal aureus* patellar tendon abscess and septic prepatellar bursitis in an injection drug user

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## ARTICLE INFO

## Article history:

Received 3 October 2018  
 Revised 30 October 2018  
 Accepted 30 October 2018  
 Available online 16 November 2018

## Keywords:

Abscess  
 Tendon injuries  
 Methicillin-resistant *Staphylococcus aureus*  
 Bursitis

## ABSTRACT

We report a case of intratendinous patellar abscess and prepatellar septic bursitis following direct inoculation in a 26-year-old male injection drug user. The patient presented with 2 days of progressive knee pain, swelling, and erythema. Computed tomography demonstrated an enlarged patellar tendon with central low attenuation. Ultrasonography revealed a complex intratendinous fluid collection concerning for abscess. Aspiration of this fluid collection yielded grossly purulent fluid which grew methicillin-resistant staphylococcal aureus. The patient subsequently underwent operative debridement which revealed an intratendinous patellar abscess with extension to involve the prepatellar bursa. This case report demonstrates typical, though nonspecific, radiographic findings of abscess in an atypical location and highlights the importance of clinical history in diagnosing musculoskeletal disorders, particularly in the absence of traditional types of traumatic injury.

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## Introduction

According to the World Health Organization, there are approximately 13 million persons who inject drugs worldwide. Injection drug use is associated with a host of health-related complications including human immunodeficiency virus infection, hepatitis C, soft tissue infections [1], bacteremia, and infective endocarditis [2]. Soft tissue infections associated with injection drug use most commonly include cellulitis and

superficial abscess formation. In this case report, we present a case where an injection drug user presented with right knee pain after attempting to inject drugs into the knee and was subsequently found to have an intratendinous patellar abscess.

## Case report

A 26-year-old male with past medical history of motor vehicle collision resulting in right femur fracture status

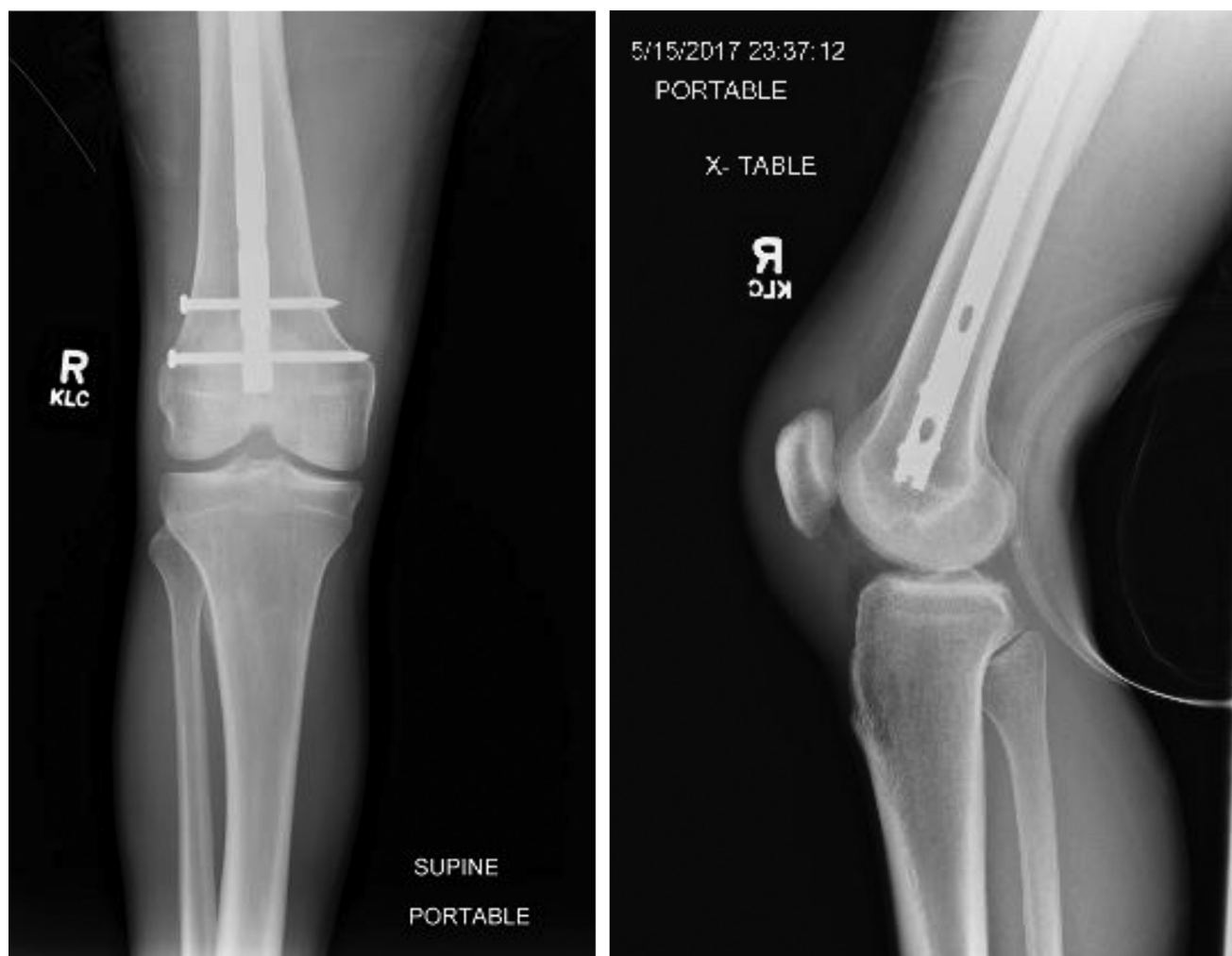
Conflict of Interest: The authors declare that they have no conflict of interest.

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<https://doi.org/10.1016/j.radcr.2018.10.036>

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**Fig. 1 – Right knee radiographs on presentation. AP view is unremarkable apart from partial visualization of intramedullary nailing hardware from remote femur fracture (a). Lateral view demonstrates soft tissue thickening in the region of the patellar tendon and a small joint effusion (b).**

postintramedullary nailing and polysubstance abuse presented with a chief complaint of progressive right knee pain, swelling, and erythema over 2 days. The patient reported recent injection drug use including a recent attempt to inject drugs into the soft tissues of the right knee. No other trauma to the right knee was reported. On presentation he was found to have a leukocytosis of 17.9 and elevated CRP of 3.23. Blood cultures were negative and remained negative throughout his admission. Initial radiographs of the right knee revealed soft tissue swelling anteriorly, in the region of the patellar tendon, as well as a small joint effusion (Fig. 1). Orthopedic surgery was consulted and attempted right knee joint aspiration without return of synovial fluid. The patient subsequently was admitted and started on broad spectrum intravenous antibiotics for treatment of cellulitis and concern for possible septic bursitis vs septic arthritis. On day 2 of his hospital stay, contrast-enhanced computed tomography of the right knee was obtained which showed prepatellar soft tissue thickening and enlargement of the patellar tendon with

central low attenuation and subtle peripheral enhancement (Fig. 2). No joint effusion, osteolysis, or periosteal reaction was noted. The central low attenuation was interpreted to represent either fluid with septic patellar tendonitis or patellar tendinosis with partial tear of the patellar tendon provided as differential considerations. Ultrasound of the patellar tendon was recommended. On day 3 of admission, patellar tendon ultrasound was obtained which showed diffuse patellar tendon thickening with a central area of low echogenicity with increased peripheral blood flow on Doppler imaging interpreted as representing intratendinous abscess (Fig. 3). Fluid was also present within the deep infrapatellar bursa. Given this finding, orthopedic surgery recommended aspiration and drainage of the fluid collection. On day 4 of admission, ultrasound-guided aspiration of the fluid collection was performed in interventional radiology. The procedure yielded 1 mL of viscous, brown aspirate. Gram stain of the aspirate revealed Gram-positive cocci and orthopedic surgery planned to perform incision and drainage. Abscess culture



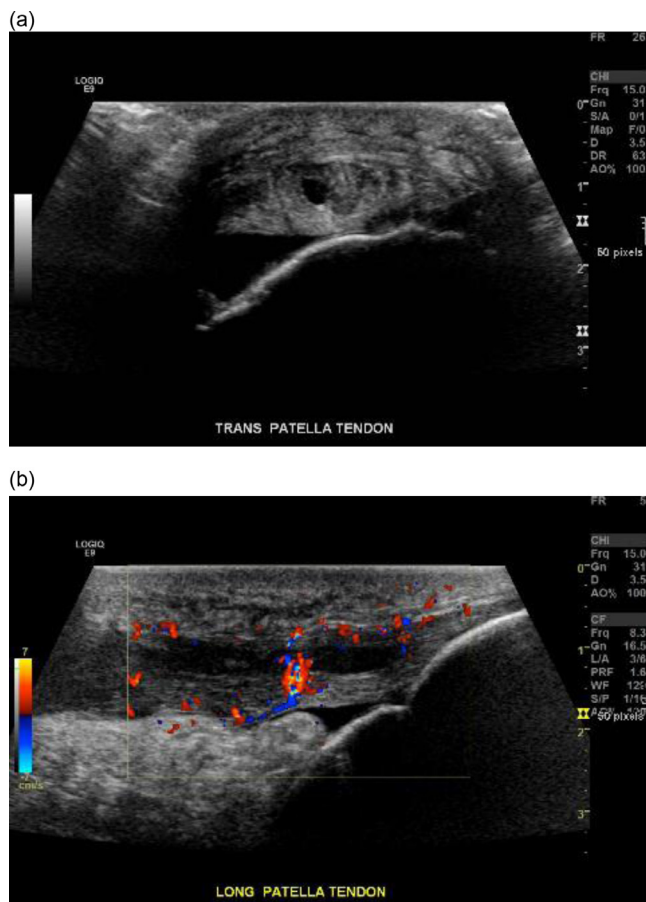
**Fig. 2 – Contrast-enhanced computed tomography of right knee. Axial slice through the mid patellar tendon shows an abnormal focus of low attenuation in the center of the tendon (a). Sagittal slice through the patellar tendon demonstrates the elongated low attenuation fluid collection with subtle peripheral enhancement as well as prepatellar soft tissue thickening (b).**

results returned methicillin-resistant *Staphylococcus aureus*. On day 5 following initial presentation, he was taken to the operating room for incision and drainage with orthopedic surgery. During surgery, the patellar tendon was incised revealing an intratendinous abscess which extended into the prepatellar bursa. The debrided material and aspirate were sent for culture and the infected sites were evacuated. Cultures from the fluid collected during surgery also grew methicillin-resistant *Staphylococcus aureus*. Following surgery, his antibiotic coverage was narrowed to vancomycin. The remainder of his postoperative course was uneventful. He was transitioned to oral antibiotics and discharged to home.

## Discussion

Injection drug use is increasing in the United States, particularly related to injection of prescription opioids [3]. With this increasing trend, it can be expected that complications of injection drug use, including rare complications as presented in this case report, may also rise. Intratendinous abscesses are rare; however, cases have been reported following cat bites [4], surgery [5], and corticosteroid injection for

treatment of tendinopathy [6]. All of these cases involved the Achilles tendon. Our case of intratendinous abscess illustrates a rare complication of injection drug use involving the patellar tendon which demonstrated characteristic imaging findings, particularly when viewed in the appropriate clinical context of a known injection drug user. To our knowledge, no cases of intratendinous abscess of the patellar tendon have been reported. Contrast-enhanced computed tomography demonstrated enlargement of the patellar tendon with central low attenuation and subtle peripheral enhancement. These imaging characteristics are somewhat nonspecific and could have represented a focal partial thickness tear. Ultrasound was used in this case to further characterize the focal low attenuation as a definitive fluid collection and likely an abscess in this clinical context. Aspiration and subsequent incision and drainage confirmed the diagnosis and further delineated the extension of purulent material to the prepatellar bursa. Overall our case illustrates the characteristic imaging findings of an abscess in an uncharacteristic location. To our knowledge, this represents the first case report of this unique intratendinous abscess. This case also highlights the importance of clinical history in the setting of musculoskeletal disorders and imaging findings in the absence of typical trauma and provides an illustrative example of a more rare complication of injection drug use.



**Fig. 3 – Patellar tendon ultrasound.** Transverse sonographic image demonstrates the hypoechoic fluid collection in cross section within the patellar tendon with mild internal echogenic debris (a). Longitudinal color Doppler image depicts the elongated intratendinous fluid collection with increased peripheral blood flow (b). Also note the abnormal thickening of the patellar tendon and the prepatellar soft tissues as well as a small amount of fluid in the infrapatellar bursa.

## REFERENCES

- [1] Ciccarone D, Unick G, Cohen J, Mars S, Rosenblum D. Nationwide increase in hospitalizations for heroin-related soft tissue infections: associations with structural market conditions. *Drug Alcohol Depend* 2016;163:126–33.
- [2] Murdoch D, Corey G, Hoen B, et al. Clinical presentations, etiology and outcome of infective endocarditis in the 21st century: the international collaboration of endocarditis-prospective cohort study. *Arch Intern Med* 2009;169(5):463–73.
- [3] Jones C, Christensen A, Gladden R. Increases in prescription opioid injection abuse among treatment admission in the United States, 2004–2013. *Drug Alcohol Depend* 2017;176:89–95.
- [4] Mersch D, Ekkernkamp A, Seifert J. The vulnerable heel of the Achilles: intratendinous abscess following a cat bite. *Z Orthop Unfall* 2017;155(3):324–7.
- [5] Konda S, Gyftopolous S, Dayan A. Late intratendinous abscess of the Achilles tendon complicating surgical repair: a case report. *Foot Ankle Int* 2010;31(12):1118–21.
- [6] Saglam N, Akpınar F. Intratendinous septic abscess of the Achilles tendon after local steroid injection. *J Foot Ankle* 2009;48(5):565–8.