Retrocalcaneal septic bursitis as a complication of a delayed-healing heel wound

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Introduction: Bursitis may arise from non-infectious and infectious aetiologies. Clinically, distinguishing one from the other can be challenging. Aseptic retrocalcaneal bursitis is a common disorder among athletes and physically active people. In contrast, infectious (septic) bursitis, although a common diagnosis in the olecranon and prepatellar bursa, has rarely been reported in the retrocalcaneal bursa.

Case presentation: Here, we present an unusual case of retrocalcaneal septic bursitis as a complication of a delayed-healing heel wound in a patient with underlying calcific insertional Achilles tendinopathy and aseptic retrocalcaneal bursitis.

Conclusion: Physicians should be aware of this clinical entity as a possible complication of a heel wound and initiate appropriate management if an infectious process is suspected.

Keywords: infectious; insertional calcific tendinopathy; retrocalcaneal bursitis; septic.

Introduction

Aseptic retrocalcaneal bursitis is a common disorder among athletes and physically active people. It is usually associated with insertional Achilles tendinopathy and is commonly called Haglund’s syndrome (van Dijk et al., 2011). In contrast, retrocalcaneal infectious (septic) bursitis has rarely been reported in the English literature (Harwell & Fisher, 2001; Abdelwahab et al., 2005; Samuel et al., 2011). This is in clear contrast to olecranon and prepatellar septic bursitis, which are both more common and are widely discussed in the available literature (Soderquist & Hedstrom, 1986; Small & Ross, 2005). Here, we present an unusual case of retrocalcaneal septic bursitis as a complication of a delayed-healing heel wound in a patient with underlying calcific insertional Achilles tendinopathy and aseptic retrocalcaneal bursitis.

Case report

A 58-year-old obese woman (body mass index 37.9) with a previous medical history of hypothyroidism presented to her primary care physician with complaints of right heel pain and swelling around the insertion of the Achilles tendon for 1 month. She had recently started an exercise regimen for weight loss. Her job also required a significant amount of ambulation. An X-ray of her right foot showed heterotopic ossification of the distal Achilles tendon and obliteration of the radiolucency of the pre-Achilles fat pad, confirming the diagnosis of calcific insertional Achilles tendinopathy and aseptic retrocalcaneal bursitis. Non-steroidal anti-inflammatory treatment and activity modification was recommended; however, due to her not undertaking strict compliance to the treatment, she continued to have intermittent pain and oedema of the heel. In the following weeks, due to the increased physical activity, a right heel callus developed over the most posterior plantar aspect of the heel. Subsequently, she developed a non-healing linear fissure over this callus formation for which she underwent excisional debridement of the callus. There was no drainage or erythema around the wound at the time of the procedure. The wound failed to heal and a second excisional debridement was required 4 weeks after the initial procedure. No evidence of infection was encountered during the second procedure. However, 4 days after the second debridement, the patient developed erythema, tenderness and oedema between the medial malleolus and distal Achilles tendon with an area of fluctuance. Deep-tissue infection was suspected and therefore the patient was brought to the operating room. Incision and drainage revealed serosanguineous fluid from the retrocalcaneal bursa with a foul odour. Debridement was performed and a deep-tissue culture was taken. The wound was packed and sterile dressing was applied. Initially, oral trimethoprim-sulfamethoxazole 160/800 mg twice daily was prescribed. The results from the deep-tissue culture showed heavy growth of meticillin-susceptible Staphylococcus aureus that was only resistant to...
penicillin, erythromycin and clindamycin. Three days after the surgery, the patient developed shaking chills, night sweats and fever up to 103 °F for which she was admitted to the hospital. An increased amount of purulent drainage was noted from the surgical wound that tracked down to the lateral aspect of the Achilles tendon. She was found to have acute renal failure, a white blood cell count of 20000 cells μl⁻¹ and 14 % bands. Cefazolin 2 g intravenously every 8 h was started. Right foot magnetic resonance imaging confirmed an abscess at the site of the retrocalcaneal bursa with underlying bone-marrow oedema of the calcaneus. Wound debridement and complete bursectomy were performed and deep-tissue cultures once again showed heavy growth of *S. aureus* with an identical antimicrobial susceptibility pattern. Blood cultures were negative. The patient gradually improved and was discharged home to complete her course of intravenous cefazolin. Although, the bone-marrow oedema seen on the magnetic resonance imaging was thought to be reactive from the overlying suppurative infection, osteomyelitis could not be completely ruled out, and therefore a 6-week course of intravenous antibiotics was recommended. Subsequently, the surgical wound completely healed. A follow-up X-ray a few months later showed no evidence of osteomyelitis of the calcaneus.

**Discussion**

A bursa is an anatomical fluid-filled structure that reduces friction between tendons and bones with repetitive motion. Bursitis may arise from infectious and non-infectious aetiologies and to distinguish one from the other clinically can be challenging. Septic bursitis most commonly arises from direct inoculation through the skin and less often via a haematogenous route. Typically, patients with septic bursitis will present with erythema, swelling, pain, tenderness, warmth and fluctuance in the involved bursa. Fever is usually present. Pre-disposing factors for septic bursitis include a history of trauma to the affected area, immunosuppression, diabetes, alcoholism, chronic renal failure and previous local corticosteroid therapy. The majority of septic bursitis cases are caused by *S. aureus* (Hanrahan, 2013), followed by *Streptococcus* sp. and less often enterococci, coagulase-negative staphylococci and Gram-negative bacilli (Small & Ross, 2005). Despite its common presentation in the olecranon and prepatellar bursae, septic bursitis of the retrocalcaneal bursa has rarely been reported. This is partly due to the deeper anatomical location of the retrocalcaneal bursa, protected by the overlying Achilles tendon (van Dijk et al., 2011). A PubMed literature search revealed a total of four cases of retrocalcaneal septic bursitis (Table 1), two of which were related to *Mycobacterium tuberculosis* (Abdelwahab et al., 2005; Samuel et al., 2011) and one to meticillin-susceptible *S. aureus* (Harwell & Fisher, 2001).

Treatment of septic bursitis is somewhat controversial and currently there are no clear guidelines (Hanrahan, 2013). Recommendations range from conservative management with oral and intravenous antibiotics to surgical excision of the bursa (Perez et al., 2010; Hanrahan, 2013). Due to the high prevalence of *S. aureus* in septic bursitis, empiric antibiotic treatment should target this micro-organism, unless there is a reason to suspect another micro-organism in the infectious process. Subsequently, antibiotic therapy should be tailored according to culture results. The length of antibiotic therapy and whether intravenous antibiotics are needed is not clearly defined. The decision on the treatment plan can depend on the duration and severity of symptoms and needs to be individually customized. Patients should be treated with antibiotics until the infection resolves. Initial aspiration and repeated aspirations of the bursa may be needed. Certain patients will require incision, debridement, and partial or complete bursectomy. Both open and endoscopic bursectomies have been described in the literature (Kondreddi et al., 2012).

Our case required two open debridements in combination with antibiotic treatment. In the beginning, oral antibiotic was used but was switched to intravenous treatment due to the systemic involvement of the infection. We also opted for longer intravenous antibiotic treatment due to a suspicion of calcaneal osteomyelitis. Because only a partial bursectomy was performed during the first surgical procedure, complete bursectomy could perhaps have prevented the need for a second surgical procedure. It is also not clear whether the underlying aseptic bursitis predisposed this patient to the development of septic retrocalcaneal bursitis in this case.

In conclusion, septic bursitis of the retrocalcaneal bursa has rarely been reported. Physicians should be aware of this clinical entity as a possible complication of a heel wound and institute appropriate management if an infectious process is suspected.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age (years)/gender</th>
<th>Tissue culture</th>
<th>Surgical procedure</th>
<th>Concomitant foot/ankle infection</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samuel et al. (2011)</td>
<td>40/female</td>
<td>NG</td>
<td>Excisional biopsy of bursa</td>
<td>None</td>
<td>Healed</td>
</tr>
<tr>
<td>Samuel et al. (2011)</td>
<td>27/female</td>
<td>MTB</td>
<td>Excisional biopsy of bursa</td>
<td>Talus OM</td>
<td>Healed with arthritis</td>
</tr>
<tr>
<td>Abdelwahab et al. (2005)</td>
<td>35/female</td>
<td>MTB</td>
<td>Debridement of bursa</td>
<td>Calcaneus OM</td>
<td>Healed</td>
</tr>
<tr>
<td>Harwell et al. (2001)</td>
<td>12/male</td>
<td>MSSA</td>
<td>Debridement of bursa</td>
<td>Possible calcaneus OM</td>
<td>Healed</td>
</tr>
<tr>
<td>This case</td>
<td>38/female</td>
<td>MSSA</td>
<td>Debridement of bursa</td>
<td>Possible calcaneus OM</td>
<td>Healed</td>
</tr>
</tbody>
</table>

**Table 1.** Cases of retrocalcaneal septic bursitis in the literature. NG, no growth; MTB, *Mycobacterium tuberculosis*; MSSA, meticillin-susceptible *S. aureus*; OM, osteomyelitis
References


