

Paraspinal Tropical Pyomyositis and epidural abscesses presenting as low back pain

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We present the case of a 13-year-old patient who presented to the Emergency Department with low back and flank pain. Cross sectional imaging revealed paraspinal pyomyositis and epidural abscess. A detailed patient history revealed a recent lower extremity skin infection consistent with tropical pyomyositis. Review of this case shows the importance for recommending either contrast enhanced computed tomography (CT) imaging of the spine and/or magnetic resonance imaging (MRI) in patients with a recent skin infection and acute onset of back pain.

Introduction

Low back pain is a common cause of Emergency Department visits and a large source of medical care expenditures [1, 2]. Physical exams are often non-specific and

require radiology follow-up to determine the etiology of the patient's discomfort and pain [2]. The most frequent musculoskeletal causes of low back pain presenting to the Emergency Department range from congenital musculoskeletal problems, such as scoliosis or Scheuermann disease, or acquired musculoskeletal problems, such as trauma, spondylolysis or degenerative disc disease [3, 4]. These etiologies are often diagnosed by radiographs or non-contrast computed tomography (CT). However, certain symptoms may be expressed that are worrisome for more serious underlying conditions. These symptoms include fever, severe or constant pain, worsening pain over time, evidence of neurologic dysfunction and/or interference with daily activity [3, 5]. One etiology of low back pain that presents in this manner is infection [4]. Infection is not easily diagnosed on non-contrasted studies alone; therefore imaging studies must be carefully scrutinized for signs of infection. We present a case of low back pain secondary to paraspinal pyomyositis and complicated by epidural abscess.

Citation: Mitchell LA, Rooks VJ, Martin JE, Burgos RM. Paraspinal Tropical Pyomyositis and Epidural Abscesses Presenting as Low Back Pain. *Radiology Case Reports*. [Online] 2009;4:303.

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Abbreviations: CT, computed tomography; MRI, magnetic resonance imaging

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Published: July 27, 2009

DOI: 10.2484/rcr.v4i3.303

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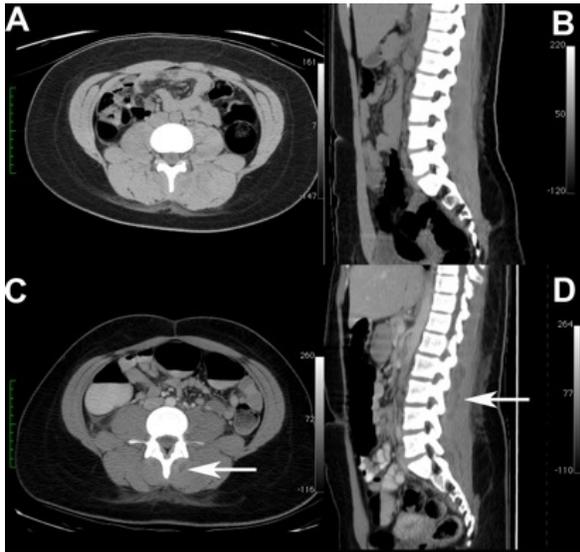


Figure 1. 13-year-old with paraspinal abscesses. Non-contrast enhanced CT imaging of the renal collecting system for the evaluation of nephrolithiasis was negative for calcification. Hypodensity was noted in the left paraspinal musculature on axial imaging using soft tissue window levels (W342/L56) (Figure 1A) but not as well delineated on sagittal images (Figure 1B) using the same display settings. The post contrast axial and transverse CT images demonstrate peripheral wall enhancement (white arrow) consistent with paraspinal abscess (Figure 1C). The reconstructed sagittal imaging demonstrates multilevel abscesses (white arrow).

Case Report

A 13-year-old patient presented to the Emergency Department with a chief complaint of low back pain radiating to the right flank. The medical history was without family history of stone disease or a personal history of stone disease, neoplasm, immunodeficiency or trauma. The history was only positive for a small upper thigh skin infection within the past month that resolved without medical treatment. On physical exam, the patient had pain exacerbated by all movements localized to the upper lumbar spine without overlying skin erythema.

Upright anterior posterior (AP) radiographs of the abdomen followed by AP and lateral radiographs of the lumbar spine did not demonstrate a specific etiology for the patient's level of discomfort (not shown here).



Figure 2. 13-year-old with paraspinal abscesses. Post Gadolinium lumbar spine MRI in the transverse (Figure 2A, T1 FSE TR/TE 550/10.168 W/L 2470/1065) and sagittal plane (Figure 2B & 2C, T1 FSE TR/TE 466.664/18.708; W/L 1385/692) confirm the paraspinal musculature abscesses (white arrows) and epidural abscess (black arrow).

Given the negative radiographs and the patient's flank pain, a renal stone CT scan was obtained to exclude nephroureterolithiasis. The CT scan was negative for nephrolithiasis but did suggest multiple small hypodensity foci within the left paraspinal muscles (Figure 1A & 1B). Further questioning of the patient and family was significant for a febrile episode within the past 72 hours and subsequent laboratory studies revealed a mild leukocytosis. With this new information, a CT of the abdomen and pelvis using 2 milligrams (mg)/kilogram (kg) of Iovue 180 contrast (Bracco Diagnostic, Inc., Princeton, NJ) better defined the regions of hypodensity as rim enhancing fluid consistent with abscesses (Figure 1C & 1D). An enhanced thoracolumbar spine magnetic

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resonance imaging (MRI) study utilizing 0.2 mg/kg of Magnevist (Bayer Healthcare Pharmaceuticals, Wayne, NJ) was performed for improved sensitivity in the evaluation of spinal cord abnormalities and confirmed multilevel thoracolumbar dorsal paraspinal and epidural abscess (Figure 2). The Neurosurgeon on-call cultured the abscesses confirming *Staphylococcus aureus* tropical pyomyositis.

Discussion

Low back pain is a common cause of Emergency Department visits and a large source of medical care expenditures [1, 2, 6]. Imaging plays a key role in the appropriate diagnosis and management of low back pain [4]. The common causes of back pain evident on imaging are either congenital or acquired musculoskeletal etiologies. Common congenital musculoskeletal etiologies are scoliosis, Scheuermann disease, congenital absence of a pedicle, sickle cell pain crisis, or syringomyelia [5]. Common acquired musculoskeletal problems are spondylolysis, degenerative disc disease, idiopathic juvenile osteoporosis, sacroiliac joint stress, ankylosis spondylolysis, or arthritis related to inflammatory bowel disease or psoriasis [5]. Other common non-musculoskeletal sources of low back pain are pneumonia, pyelonephritis, pelvic inflammatory disease, cholecystitis, or pancreatitis [5]. The aforementioned etiologies are diagnosed by radiographs and/or non-contrast CT. However, patients that present with a history of young age (such as less than 4 years of age), fever, weight loss, severe or constant pain, progression over time, history of acute or repetitive trauma, neurologic dysfunction, and/or interference with activity raise the concern of more worrisome pathology such as neoplasm, heart and/or vascular disease, or infection [3, 4]. Infection may be from an osteomyelitis, epidural abscess, discitis, or pyomyositis [4].

Infection is one diagnosis that when clinically suspected needs to be discussed between providers to determine the appropriate course of action. CT is readily available and will often lead to a diagnosis of soft tissue or muscle abscess. Appropriate laboratory values such as white blood cell (WBC), c-reactive protein (CRP), elevated sedimentation rate (ESR) can be helpful in guiding further imaging. If intradural or intramedullary disease is suspected, an MRI is preferred given the low sensitivity and specificity of CT for neural axis

abnormalities. This difference in sensitivity and specificity raises the question of what information, albeit laboratory or history, need to be discussed between the ordering provider and radiologist to further define the infectious causes of low back pain. Epidural abscesses present with persistent back pain and with loss of motor strength, bladder control, or paraplegia and is detectable on an MR of the spine [7]. Spondylodiscitis presents as unremitting back pain that may wake the patient at night and is not relieved by rest nor analgesics and is detectable on a CT scan [8]. Pyomyositis may or may not have findings on CT and may present with a variable history. As such, the history and presentation of pyomyositis will be the focus of the remainder of this discussion.

Tropical pyomyositis is an infection “marked by pain in the extremities, fever of a remittent or intermittent type, and abscesses in the muscles in various parts of the body [9].” Tropical pyomyositis is a form of pyomyositis most often directly associated with *S. aureus* infection and with immunosuppression secondary to parasitic infection [9, 10]. As cross sectional imaging has spread world wide, cases of tropical pyomyositis are being reported in otherwise healthy individuals whose only history is of strenuous muscle training [10]. Because of the rising incidence of HIV/AIDS, diabetes, and chronic steroid use, cases of tropical pyomyositis and pyomyositis are on the rise [10, 11] with a decline in the subjective or objective difference between tropical pyomyositis and pyomyositis [12]. Pyomyositis is much more common than the illness known as tropical pyomyositis. Pyomyositis is described as “abscesses, carbuncles, or infected sinus lying deep in muscles [9].” Pyomyositis was first described in the literature in 1855 by a group of Japanese physicians (10). Sir William Osler described pyomyositis as an entity in the 1870s although the first documented case in North America did not occur until the mid 1970s [10, 11].

Pyomyositis has three stages of presentation: invasive, purulent, and late or septic stage [10, 13]. The invasive stage or first stage of pyomyositis presents as cramping, pain, edema, fevers and the sensation of “woody” musculature [10, 13]. This may resemble a common muscle ache and often be overlooked by the patient and during initial clinical exams. Patients more commonly present with purulent or late/septic pyomyositis [13]. Purulent stage or stage two pyomyositis is associated with many of the same symptoms as stage one

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but also may have fluctuating tenderness, elevated ESR, and leukocytosis [10]. Late or septic pyomyositis or stage three pyomyositis is the septic presentation of the illness with indurated skin [10]. The stage of infection when in combination with the location of presentation is what makes diagnosing pyomyositis difficult. The paraspinal musculature is one location of pyomyositis presentation; however, an extremity infection is more common a presenting location than the thorax or trunk [13].

Despite the known 6% incidence of paraspinal musculature involvement in cases of pyomyositis [13], a review of the literature demonstrates little discussion of an association between paraspinal pyomyositis and epidural abscess. Pyomyositis is caused by transient bacteremia rather than local extension of infection [13] which may explain how paraspinal abscesses may be present at one spinal level while an epidural abscess may be present at a discontinuous level. A review of nine cases of pyomyositis at our facility over the past seven years revealed that three of the nine cases had paraspinal musculature infection and epidural abscesses (Mitchell, LA, unpublished data). Since most emergent back pain imaging studies are not ordered to utilize contrast and/or are performed at institutions at a time when a radiologist is not available to administer contrast [4], care must be taken to carefully evaluate the paraspinal soft tissues for small foci of hypodensity consistent with abscess. Unless radiologists are aware of this potential cause of low back pain, pyomyositis cases may go undiagnosed. As Dunkerley, et al. reported, when cases of pyomyositis are untreated, the mortality rate increases drastically [10]. All physicians should know that infection may not only lead to musculature infection but also to epidural infection and, without appropriate treatment, death.

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