



Back Pain in a 17-Year-Old Male

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Abstract

Paraspinal abscesses are a rare cause of lower back pain in children and adolescents. *Staphylococcus aureus* is the most common bacterial cause and risk factors include immunocompromised state, diabetes, or spinal trauma. In this case report, we discuss a case of paraspinal abscesses secondary to *Fusobacterium necrophorum* in a healthy adolescent male who presented with an acute onset of back pain and no additional risk factors for paraspinal abscesses. This case suggests that *Fusobacterium necrophorum* should be considered in pediatric adolescent patients presenting with paraspinal abscesses.

Keywords: Back Pain; Fusobacterium; Spine; Abscess

Case Presentation

A 17-year-old healthy male with a history of Lyme disease presented to the hospital with two weeks of worsening lumbar pain. Ten days prior to presentation, he exercised intensely with boxing at a gym and woke up the next morning with constant, non-radiating, sharp lumbar pain that worsened with flexion. Two days prior to presentation, he was evaluated by an outside emergency department and a lumbar spine X-ray was reportedly normal. He was diagnosed with musculoskeletal strain and advised to continue supportive care with non-steroidal anti-inflammatory drugs and a back brace. However, due to multiple episodes of vomiting, worsening lumbar pain with nighttime awakening, and difficulty ambulating, he was brought to our hospital for further evaluation.

Evaluation

Upon arrival to the emergency department, vitals were significant for tachycardia to 127 bpm. He was afebrile and the rest of the vital signs were normal. He denied any fevers, chills, night sweats, weight loss, constipation, diarrhea, dysuria, hematuria, bowel or bladder incontinence, ataxia, saddle paresthesia, muscle weakness, or recent illnesses. Physical examination revealed diffuse lumbar paraspinal muscle tenderness worse on the right side with prominent swelling on the right, and pain with flexion of lumbar spine. The head and neck exam revealed normal oropharynx and dentition without cervical lymphadenopathy. The rest of the exam was unremarkable including normal strength, sensory, and cranial nerve testing. The gait exam was deferred due to severity of back pain. Initial labs were significant for leukocytosis, elevated inflammatory markers, elevated creatine phosphokinase, normal liver function, and positive COVID-19 PCR. He became febrile to 38.0°C, and therefore a blood culture was obtained. Pediatric Orthopedics and Infectious Disease recommended empiric treatment with parenteral ceftriaxone and clindamycin. Magnetic Resonance Imaging (MRI) of lumbar spine revealed multiple 3.0 cm × 2.6 cm × 8.3 cm abscesses on the right and 2.5 cm × 3.1 cm × 9.1 cm abscesses on the left within the posterior parasagittal paraspinal muscles extending from L4 to approximately S2-S3 (Figure 1), with surrounding muscular edema in the lumbosacral area. There was no evidence of intraspinal infection including discitis, osteomyelitis, epidural abscess, or leptomeningitis.

The following day, he underwent incision and ultrasound-guided drainage of the abscesses by Interventional Radiology and placement of Jackson Pratt drains. On day 3, the wound culture grew *Fusobacterium necrophorum* (*F. necrophorum*) so ampicillin-sulbactam was switched for better anaerobic coverage and clindamycin was continued. Given the association of *Fusobacterium necrophorum* and Lemierre's syndrome, computed tomography scan of the neck and chest was done and negative for internal jugular venous thrombosis and pulmonary abscesses. During the hospitalization, he had downtrending inflammatory markers, negative blood cultures, and was afebrile and asymptomatic from COVID-19. Risk factors for paraspinal abscesses revealed negative

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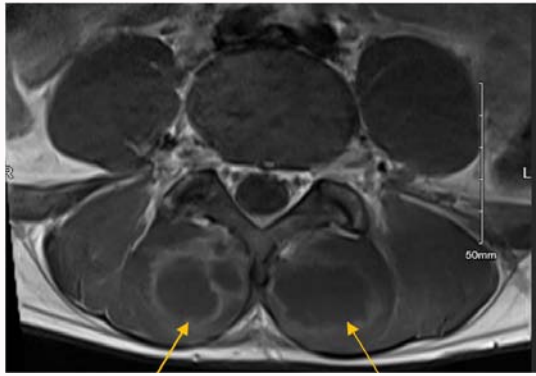


Figure 1: Hospital day 0 MRI of the lumbar spine showing bilateral paraspinal abscesses (see arrows).

HIV serology, negative T-spot, and normal HgbA1c. On day 12, repeat MRI demonstrated reduced abscess size and the drains were removed. He was discharged on day 15 with a peripherally inserted central catheter line for a total of four weeks of clindamycin and ampicillin-sulbactam. He completed his antibiotics and continued to have reduction in abscess size and no evidence of osteomyelitis.

Discussion

A paraspinal abscess is a medical emergency that can be misdiagnosed unless there is a high index of suspicion, including adult and pediatric populations with risk factors such as diabetes, immunocompromised states, or spinal trauma [1,2].

Paraspinal abscesses typically occur in the mid-thoracic or lower lumbar spine secondary to trauma from an invasive spinal procedure, and less commonly *via* hematogenous, lymphatic, and direct spread [2-4]. The most common bacterial organism is *Staphylococcus aureus*, nearly 79% [1,2]. MRI is the gold standard imaging for diagnostic evaluation [3-6]. Parenteral administration for four to eight weeks reduces the risk of osteomyelitis. However, larger abscesses may additionally need percutaneous computerized tomography or ultrasound-guided drainage [6].

In this case report, we described a healthy adolescent male with multiple paraspinal abscesses secondary to *F. necrophorum*, an anaerobic opportunistic gram-negative rod found in the respiratory, gastrointestinal, and female genitourinary tracts. *F. necrophorum* is known to cause tonsillitis, peri-tonsillar abscess, post-anginal cervical lymphadenitis, otitis media, sinusitis, and intra-abdominal infection [7,8]. The two most common strains are *F. necrophorum* and *F. nucleatum* [8]. *F. necrophorum* infections affect healthy young adults, an average age of 21 years old, but *F. nucleatum* infections affect older adults with co-morbidities, an average age of 54 years old [8]. *Fusobacterium* bacteremia is more common in males and typically caused by *F. necrophorum* [7,8]. The incidence of *Fusobacterium* bacteremia was 0.55 per 100,000 cases per year in one study in a Canadian population from 0 years to over 90 years [8]. It was also reported that one-third of *F. necrophorum* bacteremia did not have a localized infection; however, those that did were associated with either a thrombotic event or an obstetrical or pulmonary infection [8].

There are many virulence factors associated with *F. necrophorum*, however, the most notable is its leukotoxin [9]. This is a secreted high molecular weight protein cytotoxic to neutrophils, macrophages, and

hepatocytes [9]. Its size is significantly higher than other bacterial leukotoxins and protects against phagocytosis by neutrophils and Kupffer cells by releasing cytolytic products that damages the hepatic parenchyma [9].

Our patient's sex and age are risk factors for *Fusobacterium* bacteremia but did not have risk factors for paraspinal abscesses. Literature review described an adolescent male with similar symptoms and weakness caused by an epidural abscess secondary to *F. necrophorum* that extended into the psoas and paraspinal musculature and required a T2-L3 hemilaminectomy decompression [10]. *F. necrophorum* has been considered in patients with liver abscesses or in immunocompetent patients with significant periodontal disease [9].

It is possible the migratory nature of *F. necrophorum*, which contributes to 10% to 15% mortality risk from septic emboli and abscesses [7], may have led to our patient's paraspinal abscess development. Less likely mechanisms include from boxing itself such as close contact allowing for exposure to another's oral flora, combative nature allowing for microtraumas that served as entry points, or equipment hygiene allowing for shared unclean surfaces. The exact mechanism in our patient remains unclear because he did not have any known prior respiratory or gastrointestinal prodromes.

This case suggests that anaerobic pathogens can be added to the known list of causative organisms of paraspinal abscesses.

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