Early Diagnosis and Successful Empirical Treatment of L1-L2 Spondylodiscitis in a 21-Month-Old Girl: A Case Report

Shaikha Mahmood Janahi
Walaa Abdulaziz Ashoor
Abeer Abdulatif Alshaikh
Raafat Hammad Seroor

Patient: Female, 2-year-old
Final Diagnosis: Spondylitis
Symptoms: Inability to walk with constipation
Clinical Procedure: Lumbar MRI
Specialty: Neurology

Objective: Rare disease
Background: Infantile spondylodiscitis is a rare condition with a varied clinical presentation. Microbial infection may not always be identified, but early diagnosis and management are required to prevent long-term and irreversible complications, including spinal deformities and vertebral instability.

Case Report: This report is of a 21-month-old girl with a 3-week history of difficulty in walking and constipation due to L1-L2 spondylodiscitis following a gluteal skin burn. The family had sought medical advice multiple times, but results of all investigations were unremarkable. Her initial spine X-ray was negative but her spine magnetic resonance imaging (MRI) showed a picture suggestive of spondylodiscitis, which then responded to empiric treatment with broad-spectrum antibiotics. The patient showed complete resolution of clinical symptoms and her bowel habits came back to normal after 6 months of complete antibiotics treatment. Her repeat spine MRI showed a significant improvement of her spondylodiscitis.

Conclusions: This report has highlighted the importance of rapid diagnosis and management of infantile spondylodiscitis and the challenging approach to treatment when no infectious organism can be identified, as well as the early initiation of antibiotics therapy when appropriate in pediatric patients to avoid serious neurological complications associated with spondylodiscitis. Thus, it is essential to assess children with refusal to walk, gait problems, or back discomfort, especially when they are associated with high inflammatory markers.

Keywords: Discitis • Mycobacterium tuberculosis Antigens • Brucella • Botulism • Spondylitis • Mobility Limitation

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/943010

Publisher's note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacture, is not guaranteed or endorsed by the publisher.
**Introduction**

Spondylodiscitis is rare in pediatric patients [1]. The average age of diagnosis for childhood discitis is 2-8 years old, with a prevalence of around 1:250,000, or roughly 2-4% of infectious bone disorders [2]. It is an infectious disease that involves the vertebral bodies and intervertebral discs [3]. Spondylodiscitis can lead to significant mortality and poor neurological outcome if not diagnosed and treated early [1]. Children with spondylodiscitis typically present with mild non-specific clinical symptoms in the absence of high-grade fever in most reported cases [3]. Most pediatric patients present with limping and difficulty walking due to lumbar pain [3]. Magnetic resonance imaging (MRI) remains the criterion standard for diagnosing spondylodiscitis in children and for maintaining response to antibiotic therapy along with erythrocyte sedimentation rate (ESR) values [4,5].

Early treatment with broad-spectrum antibiotics leads to remission of the clinical symptoms and avoids surgical intervention; however, the duration of antibiotics treatment has no effect on outcome of the disease [6].

This report is of a 21-month-old girl with a 3-weeks history of difficulty in walking and constipation due to L1-L2 spondylodiscitis following a gluteal skin burn, which responded to empiric treatment with broad-spectrum antibiotics.

**Case Report**

A 21-month-old girl who had previously been healthy presented to the hospital’s Emergency Department (ED) with a 3-week history of difficulty in walking and constipation due to L1-L2 spondylodiscitis following a gluteal skin burn, which responded to empiric treatment with broad-spectrum antibiotics.

Physical examination showed a fully awake conscious child who refused to walk. Although she was 20 months old at that time, a neurological examination showed normal tone and power and her deep tendon reflexes were exaggerated (hyper +3 deep tendon reflexes), with no clonus. Her cranial nerve examination result was normal with no cerebellar signs. Her skin examination showed a small area of old skin burn at the gluteal region and her spine examination revealed a small intervertebral disc collection.

The initial laboratory test results were all normal: routine blood tests, including platelets, liver function, urea, and electrolytes (U+Es), glucose, complete blood count, and biochemistry results (WBC 11.83×10^9/L, neutrophils 55%). Procalcitonin was not done as the blood culture was negative). However, her initial ESR was high at 52 mm/h and her CRP was slightly elevated at 11.9 mg/L. Fine-needle aspiration was discussed with a radiology consultant but it was not done as the patient was improving clinically on antibiotics and the collection size on computed tomography (CT) was not enough for aspiration.

![Figure 1. Lumbar spine MRI of a 21-month-old child with spondylodiscitis. Initial magnetic resonance imaging (MRI) of the lumbar spine with contrast, in which transverse relaxation time (T2) sequence sagittal view of the lumbar spine shows changes at lumbar vertebrae 1 (L1), while lumbar vertebrae 2 (L2) suggests spondylodiscitis associated with a small intervertebral disc collection.](image-url)
Her blood culture, urine culture, and brucellosis culture were all negative, and *Mycobacterium tuberculosis* culture and the tuberculosis skin test were also negative. Results of plain pelvic and spine X-rays were normal. Her initial lumbar spine MRI showed features suggestive of lumbar vertebrae L1-L2 spondylodiscitis with small intra-osseous disc collection (Figure 1).

The patient was started on intravenous (IV) Cefotaxone and vancomycin for 3 weeks, followed by oral Augmentin as an outpatient for additional 3 weeks. During her hospital stay, she showed marked improvement in her clinical condition, as her gait was completely normal and repeated ESR came down to 36 mm/h.

Three weeks after discharge, the patient was followed up in the pediatrics outpatient department. She was doing well, no active problems, was walking normally, and was advised to continuing following up with the pediatrics outpatient clinic every month for 1 year.

Her repeated lumbar spine MRI after 6 weeks of antibiotic therapy showed resolution of her L1-L2 SD, with near complete resolution of the previous abscess formation (Figure 2).

**Discussion**

This report discusses the importance of early detection and suspicion of other risk factor leading to SD, such as chronic burn or infection, for early intervention and higher survival rate. Spondylodiscitis is uncommon in pediatric patients, with an overall incidence of 2.4% of all skeletal infectious conditions in children [1,7].

Children with spondylodiscitis typically present at ages 2-8 years. SD in children causes significant neurological complications, with epidural abscess being the most common infectious sequelae [8]. The complications of SD have been investigated in 25 studies, in which 1756 cases of spondylodiscitis were examined; 27.8% (488) of cases were linked to neurological deterioration, 30.4% (534 cases) to an abscess, and 6.6% (116 cases) to instability; 54.7% of the patients (961) required surgery [9]. Pediatric spondylodiscitis is an infectious process, with methicillin-sensitive *Staphylococcus aureus* (MSSA) being the most common pathogenic agent associated with PSD. Tuberculosis (TB) often impacts immunosuppressed, homeless, and alcoholic individuals, prisoners, intravenous drug users, and immigrants from Sub-Saharan Africa, India, and Southeast Asia [10]. Children with SD commonly present with difficulty walking, with limping and lumbar pain [4,11]. Our patient presented with a 3-week history of refusal to walk with frequent episodes of crying, which signify back pain, with no documented history of fever. However, there is a case report of a 19-month-old boy a low-grade fever as his initial presentation, followed by reluctance to stand or walk, with persistent crying and screaming [12].

In most pediatric patients with SD secondary to bacterial infection, the laboratory results are not significant [3]. However, ESR is considered to be the most helpful laboratory investigation to monitor the clinical cause and the response to antibiotics therapy [5]. Our patient's laboratory results showed initially high level of ESR (52 mm/h) and a repeat ESR came down to 36 mm/h.

According to Bianchini et al, spine MRI remains the most specific neuroradiological method to diagnose SD, which carries a sensitivity of 96%, specificity of 93%, and accuracy of 94%. MRI has been also used to monitor patient response to antibiotics medications [3,4]. In a systematic review study, the most affected site of SD was the lumbar spine, from L1-L2 to L5-S1 [8]. In our case, lumbar MRI showed L1-L2 a vertebral site lesion, while MRI of the previously mentioned case report

![Figure 2. Lumbar spine MRI of a 21-month-old child with spondylodiscitis. Follow-up repeated MRI of the lumbar spine with contrast performed. T2 sequence sagittal view of the lumbar spine MRI showing significant reduction of the marrow edema and intervertebral disc collection at L1-L2 after 6 weeks of antibiotic therapy.](Image)
of a 19-month-old boy showed structural change of the entire the L5/S1 intervertebral disc, with slight reduction in height and dorsal prolapse [12].

Early and aggressive treatment with a broad-spectrum antibiotic in children with SD not only avoids serious neurological complications, but also leads to a better prognosis [6]. Thus, microbiological diagnostics is critical for targeted antibiotic therapy [13]. Our patient was started immediately on IV Cefotaxone and vancomycin for 3 weeks and then discharged home on oral Augmentin for an additional 3 weeks. No anti-inflammatory agents were used in the course of treatment, as ESR and CRP were coming down with the use of IV antibiotics.

The patient showed complete recovery of her clinical symptoms and her gait was completely normal after an antibiotics course. Her repeat lumbar MRI showed significant resolution of her SD, she was discharged home in a vitally stable condition and presented after 3 weeks in the pediatrics outpatient department doing well with no problems. She is still being followed-up and the parents were advised to follow-up for 18 months.

Conclusions

This report has highlighted the importance of rapid diagnosis and management of infantile spondylodiscitis and the challenging approach to treatment when no infectious organism can be identified. SD is a rare condition in children, but if not treated properly, it can have serious consequences. To limit these hazards, a high index of suspicion, early diagnosis, and tailored therapy are required. SD might be considered in children who have back discomfort, antalgic gait, or refuse to walk, as well as unspecific symptoms such as general malaise and irritability, particularly in younger children. Imaging is crucial in the diagnosis of SD. MRI is the criterion standard examination of spine infections, particularly in the early stages of the disease when these alterations are not visible on conventional imaging tests such as CT and X-rays. This may aid in reducing diagnostic delay, while also directing the scope and duration of treatment. While ruling out so many risk factors and causative agents, a healed chronic burn still needs to be investigated as the main risk factor of SD, especially in young patients.

Declaration of Figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

References:

2. Lashkarbolouk N, Mazandarani M, Ilharreboere B, Nabian MH. Understanding the management of pediatric spondylodiscitis based on existing literature; A systematic review. BMC Pediatr. 2023;23(1):578