

THE IDENTIFICATION AND TREATMENT OF DISCITIS AND SPINAL INFECTIONS

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Abstract

Discitis and spinal infections are frequently encountered in spinal surgery, but their diagnosis and management can be complex. Early identification and treatment typically result in favorable patient outcomes, often avoiding the need for surgery. However, delayed cases with neurological impairment constitute a surgical emergency, necessitating urgent intervention to prevent permanent spinal cord damage and deformities. A multidisciplinary approach, including collaboration between surgeons and microbiologists, can help avert the need for surgery. This review article discusses the essential elements of diagnosing and managing discitis and spinal infections, drawing on the latest literature and evidence.

Introduction

Spinal infections encompass a spectrum of clinical conditions, as various anatomical structures can be affected, including the vertebral bodies, intervertebral discs, spinal canal, and paravertebral tissues. The term spondylodiscitis broadly refers to vertebral osteomyelitis, spondylitis, and discitis, which are considered different manifestations of the same pathological process. Spinal infections can also be classified by cause: pyogenic (bacterial), granulomatous (tuberculous or fungal), and parasitic (Echinococcosis).

These infections are not a modern phenomenon, with the earliest recorded case dating back to the Iron Age. In 1911, Hibbs pioneered spinal surgery as a treatment for spinal tuberculosis, performing the first spinal fusion. In recent years, a rise in immunocompromised patients, an increase in spinal procedures, and advancements in radiological imaging have contributed to the growing number of diagnosed spinal infections.

Spondylodiscitis is a complex condition that demands a multidisciplinary approach to ensure proper medical and surgical management. Early diagnosis, followed by intensive medical therapy and surgical intervention when necessary, is crucial for achieving favorable outcomes. This review examines the epidemiology, pathophysiology, clinical features, diagnostic investigations, and treatment of spondylodiscitis based on the latest evidence.

Epidemiology and Risk Factors

The epidemiological pattern of discitis shows a bimodal distribution, with two peak incidences: one in children during the first and second decades of life, and the other in adults in their fifth and sixth decades. In adults, males are affected twice as often as females. The lumbar spine is the most commonly involved region (58%), followed by the thoracic spine (30%) and cervical spine (11%), which can be attributed to variations in blood flow to different sections of the vertebral column.

Several risk factors are associated with the development of discitis, including underlying conditions that may compromise immune function and an increase in spinal procedures.

Pathophysiology

Spinal infections primarily occur via two routes: haematogenous and non-haematogenous. The haematogenous spread is more common, where circulating organisms from pre-existing

bacteraemia reach the spine through the rich arterial blood supply to the vertebral bodies and the paravertebral plexus (Batson's plexus). The most frequent sources of these infectious agents are the oral cavity, urinary tract, and gastrointestinal system.

Causative Organisms

Most spinal infections are caused by a single organism, though approximately 20% of cases involve polymicrobial infections. *Staphylococcus aureus* is the leading causative organism, responsible for up to 50% of spinal infections. The increasing prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) poses a significant challenge in treatment. Other pathogens implicated in spinal infections include Gram-negative bacilli, such as *Escherichia coli*.

Clinical Features

The clinical presentation of spinal infections can vary depending on factors such as age, immune status, the causative organism, and the location and extent of the infection. The earliest and most common symptom is back pain, which typically worsens at night. The most reliable clinical sign indicative of spinal infection is localized tenderness during gentle spinal percussion. This may be accompanied by reduced mobility and muscle spasms.

Blood Tests

Blood markers are among the first indicators of an infectious process in the spine and should be part of the diagnostic workup. The most sensitive laboratory tests for diagnosing discitis are C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), which are elevated in more than 90% of cases. However, since CRP and ESR are non-specific, their results should be interpreted in the clinical context. White cell count (WCC) is less useful, as it is elevated in only about 50% of patients.

Imaging

Initially, plain radiographs may be obtained, but these are often normal in the early stages of the disease, and radiological changes may not appear for two to three weeks. Typical imaging findings in spondylodiscitis include destruction of two adjacent vertebral bodies with collapse of the intervening disc space. In rare cases, infection may affect only one vertebral body, mimicking a compression fracture on radiographs. MRI remains the gold standard for diagnosis.

Biopsy

The use of biopsies for spinal infections has decreased due to advancements in diagnostic MRI. However, in cases where blood cultures are negative and imaging is inconclusive, a direct biopsy of the affected vertebral body is recommended. This is typically done via CT-guided biopsy, often performed by an interventional radiologist, with a success rate of up to 75% when executed properly. Multiple sites should be sampled during biopsy, including both the vertebral body and adjacent areas.

Management

The primary treatment for spinal infections is appropriate antibiotic therapy. The main objectives are to eliminate the infection, preserve or improve neurological function, and maintain or restore the stability of the spinal column.

Monitoring and Prognosis

After treatment, close follow-up is essential to monitor for either improvement or deterioration. Patients should be followed throughout the course of treatment and for up to one

year after its completion to detect potential relapses. Follow-up includes regular monitoring of inflammatory markers, periodic radiographs, and therapeutic drug monitoring when applicable. Clinical improvement is the key measure of progress, and follow-up CT or MRI is usually not required unless there are concerns about recurrence.

Summary

In summary, spinal infections and discitis are important spinal pathologies that must be promptly recognized and managed. These conditions are often underdiagnosed, and a high index of suspicion is necessary, especially as incidence is increasing. Haematogenous spread is the most common route of infection, with *Staphylococcus aureus* being the most frequently isolated organism. The most reliable clinical sign is back tenderness on light palpation or percussion, and the cornerstone of treatment is prolonged antibiotic therapy.

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