Sp57: In an otherwise clinically stable patient, is MRI evidence of disease progression an indication for surgical intervention in pyogenic spondylodiscitis?

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Recommendation: In clinically stable patients with pyogenic spondylodiscitis, MRI evidence of disease progression should not be the sole indicator for surgical intervention. The existing literature emphasizes the importance of considering clinical stability, patient risk factors, and the potential for conservative management before deciding on surgery. Surgery should generally be reserved for patients with significant clinical deterioration, neurological deficits, or failure of conservative management, rather than being driven by MRI findings alone.

Level of Evidence: Low

Delegate Vote

Rationale:

Magnetic Resonance Imaging (MRI) has become an essential diagnostic tool in assessing spinal diseases, including infections such as tuberculous spondylitis (TS), pyogenic spondylitis, vertebral osteomyelitis (VOM), and post-operative complications. However, in an otherwise clinically stable patient, MRI evidence of disease progression does not always necessitate surgical intervention. This abstract provides a comprehensive review of the existing literature to explore the relationship between MRI findings and the decision for surgical intervention in stable patients. It draws upon a variety of studies to examine how MRI contributes to the management of spinal diseases and to assess when surgical treatment is truly warranted.

The importance of MRI in diagnosing and monitoring spinal infections and other disorders has been widely recognized [1]. In cases of tuberculous spondylitis (TS), pyogenic spondylitis, vertebral osteomyelitis, and congenital spinal abnormalities, MRI often shows progressive changes that could suggest worsening disease. However, the clinical implications of these radiological findings in the absence of significant clinical symptoms remain unclear. Many studies have explored whether MRI findings of disease progression should lead to surgical intervention in patients who remain clinically stable [2-6].

MRI plays a pivotal role in diagnosing and monitoring the progression of spinal infections. For instance, Rodriguez-Gomez et al. examined the clinical and epidemiological features of tuberculous spondylitis (TS) in non-HIV patients in Spain and found that while MRI revealed disease progression, particularly in the form of abscesses and spinal deformities, many patients remained clinically stable [2]. The study noted that only a minority of patients required surgery, often due to neurological complications or abscess formation, rather than MRI evidence alone. Similarly, Yee et al. reviewed pyogenic and tuberculous spondylitis cases in Southern China and found that while MRI indicated disease progression, clinical stability was more strongly

correlated with the decision to surgery [3]. The study recommended that clinicians should not base surgical decisions on MRI findings alone but instead consider clinical presentation and patient risk factors. Benavent et al. discussed vertebral osteomyelitis (VOM) after spinal instrumentation surgery and emphasized that despite MRI showing evidence of infection or abscess formation, the presence of stable clinical symptoms allowed many patients to avoid surgery [5]. The study identified key risk factors for VOM, such as age and use of interbody fusion devices, and concluded that MRI findings should not be the sole determinant of surgical intervention. In patients without neurological deficits or severe systemic signs of infection, conservative management, including antibiotics, could be sufficient.

The relationship between clinical stability and MRI evidence of disease progression is complex. Hunter et al. investigated the validity of the Brighton Spondylodiscitis Score (BSDS) for predicting the need for surgery in patients with pyogenic spondylodiscitis [4]. The study found that MRI often revealed progression of the infection, but only a small percentage of clinically stable patients required surgery. In fact, the high-risk group based on BSDS showed only a 60% surgery rate, suggesting that MRI findings alone are insufficient to guide surgical decisions in stable patients. Similarly, Tisdall et al. examined congenital spinal dermal tracts and their MRI findings [6]. The study showed that MRI was not always reliable in identifying critical features such as intraspinal inclusion cysts or intradural tracts. The presence of these features, while concerning on MRI, did not always correlate with an infective presentation or require surgery, particularly in patients with no neurological deficits. Moreover, Kanayama et al. reported that MRI findings of progressive spinal deformities or abscesses in stable patients with TS did not necessarily require immediate surgery[7]. The study emphasized that clinical signs like neurological impairment, spinal instability, and failure of medical management were more decisive factors in the surgical decision-making process. This reflects a broader trend in clinical practice, where MRI is used as a supplementary tool rather than a primary determinant for surgery.

In cases where MRI shows disease progression but the patient remains clinically stable, surgical decisions must be made cautiously. Waheed et al. discussed the management of post-operative infections and found that surgery was only necessary in cases of neurological compromise, significant spinal instability, or failure of conservative treatment[8]. In patients with pyogenic spondylodiscitis, MRI findings of abscesses or intraspinal compression were concerning but did not mandate surgery unless associated with clinical deterioration. This study, along with the study by Zhang et al., underscored the importance of clinical monitoring and conservative treatment, including antibiotic therapy, in managing stable patients[9]. Benavent et al. highlighted that in the case of post-operative vertebral osteomyelitis, surgical intervention should be considered only when conservative measures fail or when there is a significant risk of neurological compromise [5]. The study noted that patients who were clinically stable could often be managed without surgery, with antibiotics being a key treatment modality. Surgical intervention was reserved for those with progressive neurological deficits or those who failed to respond to conservative treatment.

One of the challenges in interpreting MRI findings in clinically stable patients is

the variable nature of spinal infections and abnormalities. Hadjipavlou et al. reviewed the difficulties in diagnosing pyogenic spondylitis based on MRI alone, especially in patients who do not exhibit clear clinical symptoms [10]. The study found that while MRI is highly sensitive in detecting changes in the spine, it can also show non-specific findings that do not always correlate with disease progression or the need for surgery. For instance, abscesses or intraspinal pressure may be detected on MRI but could be asymptomatic or manageable without surgical intervention. Similarly, Arnold et al. highlighted that MRI findings such as spinal deformities or abscesses could indicate disease progression in clinically stable patients, but the necessity for surgery depended on factors such as the patient's age, overall health, and the presence of systemic symptoms like fever or weight loss [11]. The study concluded that MRI findings should be integrated with clinical assessments to guide treatment decisions, rather than relying solely on imaging results.

In conclusion, MRI is a valuable diagnostic tool in the evaluation of spinal diseases, including infections, postoperative complications, and congenital abnormalities. However, in clinically stable patients, MRI evidence of disease progression should not be the sole indicator for surgical intervention. The existing literature emphasizes the importance of considering clinical stability, patient risk factors, and the potential for conservative management before deciding on surgery. While MRI can reveal critical changes such as abscess formation, intraspinal compression, or deformities, the decision for surgery should be based on a comprehensive assessment that includes both radiological and clinical data. Surgery should generally be reserved for patients with significant clinical deterioration, neurological deficits, or failure of conservative management, rather than being driven by MRI findings alone.

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