Sp59 – In a patient with pyogenic epidural abscess, what factors would indicate the need for emergency surgery?

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Response/Recommendation: Literature indicates that the most important predictors of failure of medical treatment in SEA are a neurological deficit at presentation, DM and MRSA. Additional factors may be age > 65 years, active malignancy, elevated C-reactive protein, leukocytosis and pathological or compression fractures.

Level of Evidence: Limited

Delegate Vote:

Rationale:

Pyogenic spinal epidural abscess (SEA) is an accumulation of purulent material in the epidural space, which may lead to neural compression and/or sepsis. [1] Historically, the incidence of SEA has been estimated at 0.2–1.2 per 10,000 hospital admissions annually.[1] However, the incidence has doubled over the last 50 years, probably due to the growing geriatric population, the prevalence of diabetes mellitus (DM), and intravenous drug use (IVDU). [2]

Traditionally, emergency surgical evacuation has been the standard treatment for SEAs because of the considerable risk of rapid and irreversible neurological deficits. [2] However, with the advent of antibiotic therapy and magnetic resonance imaging (MRI) to monitor SEA progression, an increasing number of studies reported successful medical treatment of SEA with antibiotics alone. [2] The interest in medical treatment can be attributed to SEA patients often being high-risk surgical candidates, generally elderly and with multiple comorbidities. However, medical treatment may be ineffective in 6 to 60% of cases, potentially resulting in irreversible neurological deficits, sepsis, or mortality.[3] Timely identification of the predictors of unsuccessful medical treatment of SEA is crucial, as the patient may benefit from emergent surgical intervention.[4]

Nine retrospective, single-institution studies examined the predictive factors of failure of medical treatment of SEA.(Spernovasilis et al. 2017; Savage, Holtom, and Zalavras 2005; Stratton et al. 2017; Kim et al. 2014a; Page et al. 2022; Shah et al. 2018; Hunter, Cussen, and Baker 2021; Patel et al. 2014; Baum et al. 2021) The definition of failed medical treatment varied widely among studies and encompasses a range of criteria: neurological deterioration, ongoing back pain, radiological progression, lack of improvement in inflammatory markers, or mortality. [11]The predictive variables examined include presenting symptoms, inflammatory markers, radiographic characteristics, comorbidities, and causative organisms. Given the abundance of possible predictors and the possibility of inter-variable connection, it is noteworthy that six studies assessed the multivariate association of different variables with unsuccessful medical therapy. (Kim et al. 2014b; Shah et al. 2018; Page et al. 2022; Patel et al. 2014; Baum et al. 2021; Stratton, Faris, and Thomas 2018) DM showed an independent association with failed medical treatment of SEA in 5 out of 6 studies (adjusted odds ratio (aOR): range 2.4–

5.8).[1,7,9,10,12] Neurological deficit yielded the strongest association with failed medical treatment of SEA in 3 out of the four studies (aOR: range 2.3–15.8).[1,7,9,12] Methicillin-resistant staphylococci (MRSA) showed an independent association with failed medical treatment of SEA in 3 out of the six studies (aOR: range 2.8–4.4). The following variables showed an independent association with failed medical treatment in 2 out of the six studies: Age > 65 years (aOR: range 1.8–2.5) [12, 13], active malignancy (aOR: range 2.2–3.3), [8,9] elevated C-reactive protein (CRP, aOR: range 2.3–4.7), [10, 12[10,12] leukocytosis (aOR: range 3.3–4.1), [10,12] pathological or compression fractures (aOR: range 1.06–6.12). [1,9]

The motor deficit at presentation remains the strongest predictor for failed medical treatment. It is generally appreciated that surgical evacuation of SEA may be the preferred treatment option for patients with neurological deficits. Notably, the prevalence of neurological deficit in the included studies was high (range 30-40%). Brahmaness et al. have shown that SEA patients who received early or late surgery had a significantly higher chance of neurological recovery than those treated with antibiotics only. Patel et al. found that patients who failed medical therapy started with a neurological worsening (23.67 motor score reduction from 99.86 to 76.2) and improved only 85 after delayed surgery. [10] Overall, the neurological improvement after delayed surgery was significantly lower than after immediate surgery. [10]These findings highlight that neurological deficits at presentation may be the most important indication of emergency surgery, which might be further refined by DM and MRSA, which independently predict medical treatment failure.

Conclusion:

The most important predictors of medical treatment failure for SEA are DM, MRSA, and neurological deficit at presentation. These factors should signal the need for emergent surgical evacuation of SEA. Additionally, failed medical treatment may lead to neurological worsening, which might not fully recover even after delayed surgery. This further supports that SEA with neurological defects at presentation should be better treated with emergency surgical evacuation.

References:

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