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EPIDURAL ABSCESS

OVERVIEW

Epidural Abscess (EA) is a rare but serious disorder involving a localized collection of pus between the dura mater and the skull or vertebral column (1:9 ratio for intracranial versus spinal pathologies). In addition to direct compression of the spinal cord, it can cause damage through thrombosis of spinal veins or interruption of vertebral arteries. There are four stages of disease:

1. Severe back pain + fever + localized tenderness. Onset can be variable, ranging from abrupt to weeks.
2. Signs of spinal irritation – Kernig's and Brudzinski signs as well as radicular pain.
3. Neurologic deficits such as incontinence, muscle weakness.
4. Paralysis

It is important to recognize that fever may be absent in up to 1/3 of cases [1], and the stepwise progression through the four stages can be very rapid and unpredictable. Since the clinical signs are subtle at first and the mortality rate is nearly 100% if untreated, it is important that the emergency physician keep this diagnosis high on his or her differential. Consider this diagnosis for anyone with severe midline back pain.

RISK FACTORS AND MICROBIOLOGY

Risk factors include diabetes, spinal trauma (such as high impact sports), IV drug abuse, alcoholism, immune deficiency, and direct introduction of pathogens (e.g. through tattooing, paraspinal injections, epidural anesthesia). A meta analysis of 915 patients showed that up to 1/3 of cases have no identifiable source of infection [1].

Staph aureus is the most commonly identified pathogen, followed by gram negative bacilli and streptococci. [2]

EMERGENCY DIAGNOSIS AND MANAGEMENT

A single-center prospective evaluation of an emergency department-based clinical decision rule reduced diagnostic delays from 84% of patients with subsequently-confirmed spinal epidural abscess (SEA) to 10%. The critical portion of the decision rule involves obtaining an ESR on patients with positive risk factors and spinal pain and using this to decide between urgent MRI and discharge [3]. An elevated ESR was 100% sensitive and 67% specific when obtained after appropriate risk factor evaluation.

After an MRI with gadolinium is obtained with features diagnostic of EA, obtain two sets of blood cultures, a CBC with differential, and consult neurosurgery. Empiric antibiotic treatment should be started as soon as possible. A regimen targeting the typical microorganisms would include vancomycin 15-30 mg/kg BID **and** ceftriaxone 2g IV Q12 hrs. Substitue cefepime 2g IV Q8 hrs for ceftriaxone if pseudomonas coverage is a concern.

Lumbar puncture is **not** recommended due to the risk of seeding the CNS. CT-guided aspiration may be performed in order to evaluate abscess contents, but this will usually be ordered by neurosurgery.

REFERENCES

[1] E. Reihsaus, H. Waldbaur and W. Seeling, "Spinal epidural abscess: a meta-analysis of 915 patients," *Neurosurgical Review,* vol. 232, pp. 175-204, September 2000.

[2] A. Artenstein, J. Friderici, D. Lewis, J. Fitzgerald and P. Visintainer, "Spinal Epidural Abscess in Adults: A 10-Year Clinical Experience at a Tertiary Care Academic Medical Center.," *Open Forum Infectious Diseases,* pp. 1-8, 14 September 2016.

[3] D. P. Davis, A. Salazar, T. C. Chan and G. M. Vilke, "Prospective evaluation of a clinical decision guideline to diagnose spinal epidural abscess in patients who present to the emergency department with spine pain," *Journal of Neurosurgery: Spine,* vol. 14, no. 6, pp. 765-770, June 2011.