

The Cleveland Clinic

Introduction

Spinal epidural abscess (SEA) is a pyogenic infection located between the dura mater and the vertebral body of the spine (6). SEA can occur at any age, although it is more common in males and in the fifth through seventh decades of life (4). Risk factors for the development of SEA include immunocompromised states such as diabetes, malignancy, and long-term steroid use. SEAs tend to occur less frequently in the cervical spine and more frequently in the thoracic and lumbar levels (1). The mechanism for infection includes four pathways; 1) infection spread from a neighboring structure, 2) hematogenous spread, 3) iatrogenic causes, or 4) an unknown pathway assumed to be bacteremic in nature (4). While SEA is a rare occurrence, the potential for serious morbidity and mortality is high (2). Currently, the rate of mortality associated with SEAs is 15-20% (2). For those who survive, 45% of patients will suffer from long-term neurologic dysfunction with 22% of patients having severe weakness or paralysis (3).

Antibiotic therapy is the mainstay of treatment for SEA, however, failure rates of medical management alone are between 6-49%(1). Surgery offers the benefit of physically decompressing the spinal cord, debriding dead and infected tissues, and enabling a biologic diagnosis through direct culturing. Surgical approaches focus on decompression of the cord and washing of the infected area (4, 6).

The objectives of this study were to assess the clinical outcomes of SEA after surgical management and to identify patient-level factors that are associated with outcomes following surgical decompression of SEA.

Methods

A retrospective analysis of 152 consecutive patients that presented to the Cleveland Clinic with SEA and that were treated with surgery between 2010 and 2015 was performed. Post-operative pre-discharge American Spinal Injury Association (ASIA) Impairment Scale (AIS) scores, 6-month follow-up encounter AIS scores, more than one SEA surgery, and death during SEA surgery were the primary outcomes. Fisher's exact and Wilcoxon rank-sum tests were used to determine the association between patient-level factors and outcomes.

Results

152 patients (mean age, 58 years) were treated using surgical decompression and antibiotics during the study period. The majority of patients were Caucasian (81%) and male (61%). None of the patients died during surgery to treat SEA. A second SEA surgery was required in 8% of patients.

A comparison of the pre-operative AIS and post-operative pre-discharge AIS scores showed that 49% of patients maintained an AIS score of E or improved while 45% remained at their pre-operative status and 6% worsened. Among a subset of patients (n=36) for whom a 6 ± 2 month follow-up encounter occurred, 75% maintained an AIS score of E or improved, 19% remained at their pre-operative status, and 6% worsened. Both the presence and longer duration of pre-operative paresis was associated with an increased risk of remaining at the same AIS score or worsening at the post-operative pre-discharge encounter (both $p < 0.001$).

Age, race, sex, BMI, smoking status, bladder or bowel dysfunction, C-reactive protein level, white blood cell count, diabetes status, erythrocyte sedimentation rate, location of abscess in a specific spinal region, and degree of thecal sac compression were not associated with an increased risk of remaining at the same or worsening AIS score at the post-operative pre-discharge encounter.

Conclusions

Surgical decompression as part of the management of SEA can contribute to improving or maintaining AIS scores in most patients. The presence and duration of pre-operative paresis are prognostic for poorer outcomes and suggest that rapid surgical intervention before it develops may lead to improved post-operative outcomes.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Discuss the clinical outcomes of SEA after surgical management, 2) Identify patient-level factors that are associated with outcomes following surgical decompression of SEA, 3) Appreciate the prognostic value of pre-operative paresis on outcomes of surgical management of SEA.

References

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