

Paraplegia

Non-granulomatous Spinal Epidural Abscess: A Rehabilitation Perspective

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Summary

Spinal epidural abscess (SEA) as a cause of back pain, fever, and neurological deficits has been recognised. Reports of this entity have increased in recent years, possibly likely secondary to increasing intravenous drug abuse. Most patients recover without neurological sequelae. Recent reports in fact indicate that those with persistent deficit have a much poorer prognosis for survival. As a result, few patients with SEA are seen in spinal injury rehabilitation programmes. Our 5 years experience with SEA was reviewed. Thirteen patients were admitted with residual neurological deficits following a course of prolonged antibiotic therapy. Of these most had progressive neurological improvement with only 3 of 4 remaining Frankel class A and 3 of 7 Frankel class C. The only mortalities (2) were secondary to the underlying medical problems. Most patients were discharged home.

Key words: *Spinal cord injury; Epidural abscess; Rehabilitation outcome; Recovery pattern.*

Spinal epidural abscess (SEA) leading to permanent neurological deficit is an uncommon entity in the rehabilitation setting. Treatment consisting of antibiotics and surgery is usually effective, however, mortality rates remain high. Those patients who respond to treatment usually have rapid resolution of their neurological signs; therefore, very few patients with epidural abscesses have permanent spinal cord injury (SCI) related deficits nor are they seen in SCI rehabilitation units. As a result, there is very little information on this disease entity or rehabilitation outcome in the rehabilitation literature. Over a 5 year period, 13 patients with significant residual neurological deficits were treated in the author's SCI unit. The purpose of this paper is to review the experiences of patients with neurological deficits due to SEA, and their rehabilitation outcomes.

Literature review

SEA has always been an uncommon disease. Early studies by Baker, (1975); and

Heusner, (1948) indicated a steady incidence rate. In recent years, however, this rate appears to be increasing, (Danner, 1987). *Staphylococcus aureus* is reported as the most common organism isolated from the abscess. Gram negative organisms and others such as *Brucella* and *Actinomyces* are also reported. Hematogenous spread to the epidural space has been reported in 25–50% of cases (Verner). Trauma was a preceding incident in 15–35%. More recently, intravenous drug use has been identified as the causal circumstance.

Clinically, patients first present with non-specific complaints such as back pain, fever, and malaise. This can lead to radicular type pain and neurological deficits. The course can be quite rapid or chronic (Kaufman 1980, average of 16 days of symptoms prior to admission). In a series of 35 patients with non-granulomatous SEA seen over a 12-year period, Danner, (1987) reviewed the factors associated with this disease. The source of infection was identified in 71% of the patients. Skin and soft tissue were the most common sources, (23%). Back pain and fever were the most frequent presenting complaints. Over 50% of the patients had *staphylococcus aureus* organisms isolated. The progression of symptoms was usually spinal ache, root pain, weakness, and finally paralysis. The first three phases took hours to weeks to develop; the fourth was rapid and unpredictable. Only 3 of the 35 patients were noted to have paralysis after a course of treatment. At the time of diagnosis 8 had paralysis and 12 weakness.

Recently, a review of patients with SEA with the underlying aetiology of I.V. drug abuse was presented. Koppel, (1988) reported on 18 patients seen over a 3-year period. Again, *staphylococcus aureus* was the most common agent. Most of the patients had a chronic course of 1 to 2 months. Two thirds developed radicular patterns of pain. It was noted that 3 of the patients had a rapid onset of paralysis and no resultant improvement. It was felt that cord infarction, not compression, was responsible for the permanent deficits.

In a paper presented at the American Spinal Injury Association (ASIA) meeting, Gardner, (1989) reviewed 13 cases with SEA. Over half were infected with *staphylococcus aureus*. All patients underwent surgical debridement and cord decompression, but 7 of the 13 patients died. The 7 who died had significant neurological deficits at the time of diagnosis (Frankel A, B or C). None of the patients with minimal or without deficits died. It was assumed that a finding of significant neurological deficits indicated a poor prognosis for survival.

Methods

Thirteen patients admitted over the last 5 years to the SCI rehabilitation unit with a diagnosis of SEA were identified and their charts at the acute as well as at the rehabilitation hospital were reviewed.

Results

Epidemiology

Of the 13 patients, 7 were male and 6 were female. The age range was 32 to 80 years with an average age of 49. Eight of the 13 were intravenous drug abusers; 7 were heavy alcohol users; and 2 had metastatic carcinoma.

Clinical characteristics

The onset of symptoms was acute (less than 24 hours prior to admission) in 5 patients, subacute (less than 2 weeks in 2 patients, and chronic in the other 6 patients. Seven of the 13 had back pain, and 9 had positive blood cultures. In 10 of the 13 *staphylococcus aureus* was isolated. In one culture, the organisms isolated were *staphylococcus hominis* and *E. coli* (patient had hepatic encephalopathy); and in 2 cases no organisms were isolated. Six of the patients were diagnosed as having osteomyelitis. All patients, except one, had a surgical decompression performed, and all were treated with at least 6 weeks of intravenous antibiotics.

Neurological pattern

The thoracic region was the neurological level in 10 of the 13 cases. Two patients had cervical neurological levels and one had a lumbar level. Four patients were initially diagnosed as having complete transverse myelitis (Frankel class A). Three of these remained as class A and one improved to class C, however, that patient had an underlying problem with lung carcinoma with metastatic disease to the spine. The patient expired shortly after hospital discharge.

The majority of the patients (7 of 13) were initially diagnosed as Frankel class C (sensory and motor incomplete, but motor useless). Of these, 4 improved to class D, and 3 remained as class C. Two patients started and remained as class D (motor useful).

Ambulation of some degree was accomplished in 6 of the patients by time of discharge. Of these, only one was able to ambulate independently without any assistive device. Another patient ambulated with a cane and did not use a wheelchair. All others were at least partially dependent on a wheelchair at the time of discharge from the rehabilitation hospital.

Length of stay in the acute hospital ranged from 57–193 days. The rehabilitation stay ranged from 9–60 days with an average of 29 days. Disposition was primarily to home, however, 2 patients expired and one went to a nursing home. The other went to a psychiatric hospital because of an underlying psychiatric problem.

Discussion

Reference to spinal epidural abscess was made as early as 1820 by Morgagni and Bergamaski. This once infrequent diagnosis has recently become much more common because of the increase in intravenous drug abuse. Recent studies indicate a good prognosis for those treated promptly with surgical decompression and prolonged IV antibiotics. Mortality appears to be greater in those with persistent neurological deficits.

In this series the most common neurological level was in the thoracic region. Neurological improvement occurred in almost half the group. Two patients expired and these had significant underlying medical problems (lung carcinoma and hepatic encephalopathy). Six of the patients were able to ambulate and almost all were able to return home.

While the length of stay in the rehabilitation hospital was short in a few of the patients, (4 stayed less than 2 weeks); it should be noted that the spinal cord

rehabilitation programme is integrated with acute care and rehabilitation begins and progresses even during the acute phase when ever possible. As a result much of the rehabilitation programme was accomplished while still in the acute setting.

In summary, patients with SEA and neurological deficits have a fairly good prognosis for survival and neurological improvement with early recognition and treatment. These patients as well as those with persistent neurological deficits, are capable and successful in completing their rehabilitation programme and are able to return home.

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