

Title: DIAGNOSIS AND TREATMENT OF EPIDURAL INFECTIONS--A Complication Of Long-term Epidural Narcotic Administration

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Introduction. Epidural space infections are exceedingly rare and have a slow insidious onset with non-specific symptoms<sup>1,2</sup>. There have been individual case reports of epidural infections, but no series has been reported to illustrate the diagnostic signs and treatment results for early epidural infections<sup>1</sup>. The dura-arachnoid membranes are an effective barrier between infection and the CSF. The fear of infection, neurological deficit, and surgical decompression has led many clinicians to shy away from any externalized systems for the delivery of epidural morphine. The introduction of the externalized silicone-rubber epidural catheter limited the risk of infection through the Hickman-Broviac technology<sup>3</sup>. This paper will present our experience, diagnostic criteria, treatment plans, and outcomes from infections encountered during use of this catheter system.

Methods. Externalized silicone-rubber epidural catheters (Davol Inc.) were placed in 213 terminal cancer patients for the control of intractable pain. Exit site inflammation or infection, which did not extend beyond the Dacron cuff, was not included in our data. Infections were classified into either epidural or deep track sources. The following diagnostic criteria and testing procedures have become our current standard diagnostic protocol.

1. Symptoms
  - a. Increasing pain during epidural injection.
  - b. Visible, soft mass along catheter track.
2. Diagnostic procedure:
  - a. Remove filter and aspirate the catheter. Send for gram stain and culture.
  - b. Culture exit site and aspiration from mass.
  - c. Epidurogram to see if dye loculates.
  - d. CT scan of epidural space at level of catheter tip.
  - e. Complete blood count.

Each patient was treated with an antibiotic regimen dictated by the specific organism cultured, and ultimately each catheter was removed. Each patient was offered catheter replacement after treatment.

Results. The 9 deep infections encountered during 22,200 catheter-days of use occur at a rate of one infection in every 2466 days of use (6.8 years), compared to one infection in every 1054 days of use (2.9 years) for the Hickman vascular catheter<sup>4</sup>. Infections seemed to be unrelated to the duration of catheter use or the degree of patient disability. Successful antibiotic treatment could

only be accomplished after the catheters were removed. Three of the epidural infections were related to either direct spread from abscesses or secondary to hematogenous spread from a distant abscess. Epidural catheters were replaced 14 days after therapy was started in 6 of the 9 infected patients, after normal epidural CT scans were obtained. There were no recurrent epidural or track infections. There were no patients who either required surgical intervention, or expired due to complications related to the epidural infections.

Discussion. The risk of epidural infection due to hematogenous spread, direct extension, or cutaneous sources is real and may be devastating. These risks are not unique to externalized catheters; as the risk of hematogenous or direct spread of infection is equal for both internal and externalized systems. The risk-benefit ratio must be evaluated for each individual patient, when electing a procedure to control pain in these immunosuppressed patients. Although the sample size of epidural infections was low, we think this study indicates that epidural infections can be treated effectively without surgical intervention, if early diagnosis is obtained. The lack of recurrent infections indicates the safety of catheter replacement after aggressive antibiotic therapy. Complete surgical epidural analgesia was obtained in 2 patients after catheter replacement, indicating the lack of epidural scarring from the treated infection. We, therefore, recommend the use of the externalized epidural catheter for the control of terminal cancer pain, with the understanding that close patient supervision is required for early diagnosis of potential epidural infections.

References.

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