Dural Tears—Challenges and Costs

DURAL TEARS: A COMMON ADVERSE EVENT

Dural tears in spinal surgery are relatively common. Incidental tearing of the dura mater in spinal surgery is often underreported by hospitals and thus may be more common than previously thought. Establishing a watertight closure of the dura mater following spinal surgery is critical, as cerebrospinal fluid (CSF) leaks may lead to increased hospital costs.

- In a study at the University of Pittsburgh Medical Center, the rate of incidental dural tears during primary lumbar surgeries was 7.6%, a rate that doubled to 15.9% for revision cases.
- During a 5-year period at University Hospitals of Cleveland and Case Western Reserve University School of Medicine, 88 of 641 patients (14%) sustained a dural tear.
- In a review of 700 spinal surgeries by the University of Toronto, more than half of the reported adverse events were dural tears.

WHERE ARE THE TEARS?

According to the US Centers for Disease Control and Prevention, the highest dural tear rates occur in revision and multi-level fusion cases:

DURAL TEAR RATES IN SPINE PROCEDURES

CSF LEAKS = MONEY AND TIME

A review of US spinal surgery cases during a 2-year period (n=192,409) found the average cost of spinal surgeries with CSF leaks to be significantly higher than spinal surgeries without CSF leaks.

AVERAGE COST OF SPINAL SURGERIES, US, 2006-2008

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<th>Without CSF Leaks</th>
<th>With CSF Leaks</th>
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<tr>
<td><strong>Average Increased Cost Per Patient</strong></td>
<td>$6,479</td>
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*Due to increased ICU and hospital stays and pharmacy costs.
Source: Premier’s Perspective™ Database, Q4 2006-Q3 2008.
Premier, Inc., Charlotte, NC.

According to Jallo, et al., the increased costs resulting from CSF leaks averaged $6,479 per patient and were driven primarily by increased ICU stays (0.8 days), hospital length of stay (2.6 days) and increased pharmacy costs.

WHAT CAUSES DURAL TEARS?

Dural tears can occur for many reasons. Published data points to a variety of causes and variation in tear rates among procedure types and institutions.

- In a prospective study of 76 patients, Sin, et al. found that older patient age and higher level of surgical training were factors contributing to the incidence of dural tears, but the history of surgery was not.
- Bosacco, et al. reviewed the most common mechanisms of dural tears, listed below:
  - Revision cases: Adhesions in the epidural space and dural scarring and fibrosis
  - Primary surgery: Direct trauma or laceration; eroded or thin dura, adhesions and fibrosis, or dural redundancy in patients with severe spinal stenosis; severely herniated discs may render nerve root dissection and dural retraction difficult

In addition, faulty screw placement has been shown to cause a small number of tears. It may lead to more dead space and prevent the paraspinal muscles from effectively tamponading a small dural tear, leading to a greater risk of a clinical CSF leak.


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