Incidence and Management Outcome of Incidental Durotomy in Lumber Spinal Procedures

Nadia Iqbal¹, Zain ul Abedeen², Riaz ur Rehman³

ABSTRACT

Background: Incidental durotomy is a common complication of lumbar spine surgeries. Its incidence depends on several factors and the incidence varies from center to center.

Objectives: To know the incidence and management outcome of incidental durotomy in neurospinal procedures in a tertiary care hospital.

Material & Methods: This descriptive study was conducted in neurosurgical unit of Hayatabad Medical Complex, Peshawar from 15 July 2015 to 14 July 2017. Patients in whom incidental durotomy occurred were included in study without age or gender discrimination. Patients in whom dura was intentionally opened were excluded from the study. Primary repair was attempted in all patients. Their ages, gender, indications of surgery were reviewed and subsequent management of durotomy was documented. Patients' data analyzed in SPSS 18.

Results: Amongst 563 patients there were 344(61.10%) male and 319(38.90%) female patients. Amongst those operated, 295(52.30%) patients had lumbar disc herniation, 144(25.53%) patients had spinal stenosis, 76(13.47%) patients had traumatic lumbar vertebral fractures. Incidental dural tear was noticed in 51 (9.04%) patients. Incidence of durotomy was 21(3.36%) in male and 31(5.50%) female patients. We identified dural tears site in all patients during the surgery. Forty six (46=90.20%) dural tears were repaired primarily. Five (3=6%) patients had dural tears in unstichable area. Reexploration was done in 2(3.92%) patients. Kerrison rongeur was responsible for dural tears in 25 patients. In 15 cases dissector tore the dura.

Conclusion: Unintentional duratomy is relatively common complication especially in female and elderly patients.

Keyword: Incidental durotomy, Incidence, Management

INTRODUCTION

Incidental dural tear in neurospinal surgery is not an uncommon complication being faced by neurosurgeons. This may results in significant increase in mortality or morbidity of the patients. The incidence of dural injury ranges from 1-17% depending upon the type and complexity of the spinal procedures performed¹.². Surgeons experience play significant role in it. Similarly patients increasing age and female gender are other contributory factors (3), (4), (5), (6).

A study was conducted to see the incidence of incidental durotomies and it was found to be the second most common complication in malpractice cases. Incidental durotomy can be very serious complication at time and may even lead to meningitis and death of the patient. Some other

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MATERIAL & METHODS
This descriptive study was conducted in neurosurgical unit of Hayatabad Medical Complex, Peshawar from 1st July 2015 to 30 June 2017. Approval from ethical committee of Research, HMC, Peshawar taken before we started this study.

We explained the purpose of the study to all patients and then informed written consent was taken from them. We retrieved the patient’s record from patient’s data base of our ward computer and retrospectively analyzed.

All those patients in whom incidental durotomy occurred were included in this research project without age or gender discrimination. The patients in whom dura was intentionally opened as in cases of intradural tumors or those in whom procedure was done elsewhere and they were admitted in ward for management, were excluded from the study.

In all those patients in whom incidental durotomy occurred, we tried to repair it primarily by applying 4-0 waxed silk in continuous manner. A blood soaked surgicel or fats followed by spongostan packing was done over the dura after primary repair. Unstichable area were sealed with dural sealant, fats and spongostan. Additional lumber drain was placed and removed after two days in unstichable cases. In all repaired cases, valsalva manoeure was applied to make sure that no leak occurs after repair. Patients were advised bed rest for 48 hours post operatively. Their ages, gender, indications of surgery were reviewed and subsequent management of durotomy was documented.

Patients’ data was recorded in pre formed proforma. The data was then analyzed by SPSS-18 version. Frequency and percentage was calculated for categorical variables. Mean ± SD was calculated for age. Results were presented as graphs and tables.

RESULTS
There were total 563 patients who were selected for the study according to inclusion and exclusion criteria. Different types of spinal surgeries performed in our department were analyzed retrospectively. There were 344 (61.10%) male and 319 (38.90%) female patients.

Amongst those operated, 295 patients had lumbar disc herniation, 144 patients were operated for lumbar spinal stenosis, 76 patients were treated for traumatic lumbar vertebral fractures. Various indications of the surgery are given in the table no 1.

Incidental dural tear was noticed in 51 (9.04%) patients. Of those 344 male patients the incidence of durotomy was 21 (3.36%) while of 319 female patients the incidence was 31 (5.50%). The difference of incidental durotomy in two different sexes is statistically significant.

We appreciated the site all dural tears during the surgery. Forty six (46=90.20%) dural tears were repaired primarily by applying 4-0 waxed silk in continuous manner. Five (3=6%) patients had dural tears in unstichable area and could not be repaired primarily. Reexploration was done in two (3.92%) patient for persistent leak in whom we noted that dural stitches were torn.

We noted that Kerrison rongeur was responsible for majority of the cases of dural tears i.e. in 25 patients. In 15 cases dissector tore the dura when piece of bone or ligamentum flavum was being released from the underlying dura. The various etiological factors are shown in table 2.

<table>
<thead>
<tr>
<th>S No</th>
<th>Etiology</th>
<th>Number operated</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1</td>
<td>Lumbar disc herniation</td>
<td>295</td>
<td>52.30%</td>
</tr>
<tr>
<td>2</td>
<td>Spinal stenosis</td>
<td>144</td>
<td>25.53%</td>
</tr>
<tr>
<td>3</td>
<td>Vertebral fractures</td>
<td>76</td>
<td>13.47%</td>
</tr>
<tr>
<td>4</td>
<td>Extradural spinal tumor</td>
<td>38</td>
<td>6.73%</td>
</tr>
<tr>
<td>5</td>
<td>Spondylolistheis</td>
<td>10</td>
<td>1.77%</td>
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DISCUSSION
Incidental dural injuries are relatively common in neurospinal procedures. Incidental durotomy if not identified and rectified per operatively, may lead to persistent CSF leak, meningitis or even death of the patients. Symptoms like nausea, vomiting, postural headache, dizziness, photophobia, tinnitus and vertigo due to decrease in the volume of CSF may results from persistent CSF leak.

In this study we noted incidental durotomies in 51 (9.04%) patients. Different research studies in literature has given various ranges which start from 1 up to 17%. Various factor are affecting this figure like being done in multicentres and questionnaires based surveys. We see similar trend of findings in other local studies in which rongueur is the commonest cause followed by dissector injuries.

We did this study on 344 male patients in which we noted durotomies in 21(3.36%) patients while of 319 female patients the incidence was 31(5.50%). This is a significant genders difference statistically.

Previous research shows that increasing age and female gender has been associated with increased incidence of incidental durotomies. Our study findings are in keeping with previous authors work.

Degenerative changes like yellow ligament hypertrophy, osteophytes formation and facet hypertrophy occurs in advanced age that decrease the diameter of the spinal canal. All these factors predispose the dural to injuries in spinal surgeries. Similarly spondylolisthesis which also decreases the canal diameter leads to increase incidence of duratomy. Several researchers work reveals these degenerative changes to be risk factor for incidental dural tears. Wang et al. identified 18 different diseases association with dural injuries and found that patients with spinal canal stenosis without spondylolisthesis showed 13% of incidental duratomies. Hence, based on the findings of the present study and other's work, elderly female patients with degenerative spondylolisthesis and associated stenoses of vertebral canal should be counseled about high risk of dural injuries and its subsequent management. Kerrison rongeur is responsible for dural tear in majority of incidental durotomy cases i.e. 25(49.01%) patients. In 18 (29.41%) cases dissector caused tear in the dura. We see similar trend of findings in other local studies in which rongueur is the commonest cause followed by dissector injuries.

Relatively smaller number of patients were enrolled in this study and the surgeries were performed by different surgeons of various experiences irrespective of their experiences. I recommend larger population studies and selection of patients being operated by surgeons of reasonable experience in neurospinal surgeries to establish the study results with high level confidence.

CONCLUSION
Unintentional durotomy is not an uncommon complication in neuro spinal procedures. This is more common female population and elderly patients with degenerative spinal diseases. The commonest cause of duratomy is karrison ranjou during laminectomy.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Insulting factor to dura</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kerrison Rongeur</td>
<td>25</td>
<td>49.01%</td>
</tr>
<tr>
<td>2</td>
<td>Dissector</td>
<td>15</td>
<td>29.41%</td>
</tr>
<tr>
<td>3</td>
<td>Pituateray rongeur</td>
<td>6</td>
<td>11.76%</td>
</tr>
<tr>
<td>4</td>
<td>Knife</td>
<td>3</td>
<td>5.88%</td>
</tr>
<tr>
<td>5</td>
<td>Unidentifiable cause</td>
<td>2</td>
<td>3.92%</td>
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REFERENCES