Central Pain Syndrome in a woman with Thoracic Intradural Intramedullary Ependymoma: A Case Report and Literature Review
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Abstract
Setting: Rehabilitation Hospital. Patient: A 56 year old woman with a thoracic ependymoma. Case Description: The patient presented with right arm numbness and weakness. An MRI suggested an expanding cystic lesion at level T2 and the patient underwent cystic drainage with a T2-T3 laminectomy. Here, an ependymoma was identified and resected. Postoperatively, she was admitted as T6 ASIA D into a spinal cord program at an acute inpatient rehabilitation hospital in order to improve her function. Assessment/Results: At admission, she was at minimal assistance for activities of daily living. She received a comprehensive treatment and made significant gains; however, her sensation did not change and she had no pain. Subsequently, she underwent further radiation treatments and developed pain. The pain was 5/10 in severity, localized to the back and knees, worse with movement, and associated with spinal fluid collection. Subsequently, she underwent T1-T4 laminectomy and C5-C6, T1-T10 posterior spinal instrumentation. Her hospital and rehabilitation course was significant for uncontrolled pain even though she had treatment with methadone and gabapentin. Furthermore, she had balance dysfunction and became severely depressed. Discussion: A well-documented ependymoma and improvements with microsurgical techniques, patients need pain management to restore function. Intradural ependymomas typically occur in the cervical region; however, a thoracic ependymoma tends to have a higher mortality. The neurological morbidity depends on the pre-operative functional status and perhaps easy effective pain interventions. A majority of these patients will have proprioceptive dysfunction that also requires intensive physical therapy. This patient had the presence of an intradural neoplasm with a syrinx that suggested a noninfective lesion, a good prognosis, and may have benefited from a pain program. Conclusion: Although many people do not develop central pain syndrome following ependymoma resection, in order to optimize functional outcomes for those that do, a comprehensive approach to pain will help maximize recovery.

Key words: Ependymoma, Pain, Neoplasm, Rehabilitation.

Introduction
Thoracic intradural intramedullary ependymomas are frequently associated with cysts or syringes. These are often inexcusable with good prognosis given that they have definable margins and standard treatment following resection is radiation. Rehabilitation in these cases should involve post procedural pain involving nociceptive and neurogenic pathways. Bowsher characterized central pain as burning, sensitive to temperature, and made worse with light touch. Central pain may include other sensations as well, such as, an over exaggeration of pain or hyperpathia, located anywhere on the body including the abdomen. Presented here was a woman following resection of an ependymoma and subsequent radiation, that experienced intense, uncontrolled abdominal pain with a negative work-up. She made functional gains in acute interdisciplinary inpatient rehabilitation hospital after antidepressants, physical activity, and sleep improvement.

Figure 1. Admission 3 with FIM and Benchmark

Table 1. FIM scores for all three admissions

<table>
<thead>
<tr>
<th>Admission</th>
<th>FIM Motor</th>
<th>FIM Cognitive</th>
<th>FIM Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission 1</td>
<td>18</td>
<td>26</td>
<td>44</td>
</tr>
<tr>
<td>Admission 2</td>
<td>24</td>
<td>28</td>
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</tr>
<tr>
<td>Admission 3</td>
<td>30</td>
<td>36</td>
<td>66</td>
</tr>
</tbody>
</table>

Table 2. Pain medications during three admissions

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methadone</td>
<td>10mg</td>
<td>PO</td>
<td>TID</td>
<td>Pain control</td>
</tr>
<tr>
<td>Gabapentin</td>
<td>1200mg</td>
<td>PO</td>
<td>BID</td>
<td>Pain control</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>4mg</td>
<td>IV</td>
<td>Q6H</td>
<td>Pain control</td>
</tr>
</tbody>
</table>

Discussion
The prevalence of central pain in patients following spinal cord injury is 85% and approximately one third of these patients reported their pain as severe. Management of patients with spinal cord injury should include consideration of central pain to improve function. Reported here is a case of spinal cord injury from a resected intradural intramedullary ependymoma (for anatomical arrangement and pathology see Figures 2 and 3). The patient developed central pain that manifested itself as intense, hyperpathic abdominal pain. This patient's surgery coupled with an interdisciplinary inpatient rehabilitation program improved her outcome. Her rehabilitation showed improvements on each admission; however, the greatest improvement occurred following better pain control, improved activity, and better sleep. The patient's largest hospital stay reflected the largest gains, which may be because she had more therapy and time to recover. In this case, treatment with a selective serotonin reuptake inhibitor, which assists central pain recovery perhaps from its similarity to tricyclic antidepressants increasing norepinephrine improved her outcome. She may also have benefited from a high dose of gabapentin and, overall, her pain medications did not vary much. Another possible treatment for central pain includes spinal cord stimulation and this may be beneficial to the patient in the future. Nevertheless, improving pain whether neurogenic or nociceptive will likely improve behavior. Hence, in this case, despite a well-documented ependymoma and improvements with microsurgical techniques, patients also need pain management to optimize functional outcomes in the shortest amount of time.

Figure 2. Thoracic intradural intramedullary ependymoma

Figure 3. Ependymoma, not from this patient, showing spinal cord canal ependymal cells displacing pial membranes and fine mucinous stroma

References