Treatment of extraosseous thoracic spinal hemangiomas causing spinal cord compression

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Hemangiomas

Cavernous Hemangioma
Capillary Hemangioma

Sohn (2009)
Hasan (2011)

Vertebral Hemangiomas

- Most common benign tumor of the spine
- Estimated incidence: 10-12% of population
- Common incidental findings on imaging studies
  - Rarely symptomatic
- Most common in thoracolumbar spine


Natural History: Asymptomatic Hemangiomas

- Typically middle aged patients
- More common in females
- Generally intraosseous only
  - Localized to vertebral body
- Rarely progress to symptomatic hemangiomas
  - Risk factors: thoracic vertebra, posterior elements, age, female, cortical blistering, soft tissue extension, pregnancy

Fox (1993), Rodallec (2008)

Radiological Evaluation

Computed Tomography
Magnetic Resonance
Angiography

Acosta (2006, 2008)

Natural History: Symptomatic Hemangiomas

- 0.9-1.2% of vertebral hemangiomas
- 2-3% of all spinal tumors
- Most common in young adults
- Symptoms
  - Pain, myelopathy, radiculopathy
- Vertebral body, usually with extension into laminae, pedicles, transverse/ spinous processes
  - Poorly defined, expanded cortex
  - End plates usually preserved

Presentation of Symptomatic Hemangiomas

1. Vertebral Expansion
2. Tumor Extension
3. Hematoma
4. Fracture


Treatment Strategy

- Transarterial embolization
  - Minimize intraoperative blood loss
- Surgical decompression & reconstruction
  - Laminectomy, corpectomy, 360° fixation
- Percutaneous vertebroplasty
- Radiation therapy
- Direct injection of ethanol

*Must be tailored to specific clinical situation*

Acosta (2008), Kato (2010)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>Presenting Symptoms</th>
<th>Level</th>
<th>Extent of tumor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55</td>
<td>M</td>
<td>Gait abnormalities</td>
<td>T7</td>
<td>Large vertebral body mass with pleural extension of left paraspinal mass</td>
</tr>
<tr>
<td>2</td>
<td>75</td>
<td>F</td>
<td>Progressive paraplegia</td>
<td>T10</td>
<td>Vertebral body mass with left paraspinal extension</td>
</tr>
<tr>
<td>3</td>
<td>64</td>
<td>M</td>
<td>Gait abnormalities</td>
<td>T6-T7</td>
<td>Intraspinal mass with extension into right foramen and pleural cavity along the vertebral body</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>M</td>
<td>Gait abnormalities, incontinence</td>
<td>T6-T9</td>
<td>Paraspinal extension into foramen and beyond vertebral bodies, intradural extension</td>
</tr>
<tr>
<td>5</td>
<td>74</td>
<td>F</td>
<td>Upper back pain, Gait abnormalities</td>
<td>T6</td>
<td>Vertebral body mass with left paraspinal extension</td>
</tr>
<tr>
<td>6</td>
<td>55</td>
<td>F</td>
<td>Back pain</td>
<td>T12</td>
<td>Vertebral body mass with right paraspinal extension</td>
</tr>
</tbody>
</table>

Emory Series

Patient 1: Pre-op

Patient 1: Post-op

Patient 3: Pre-op
Follow Up

<table>
<thead>
<tr>
<th>Patient</th>
<th>Follow Up</th>
<th>Outcome</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>5 mo</td>
<td>Improved myelopathy, ambulating well</td>
</tr>
<tr>
<td>2</td>
<td>6 mo</td>
<td>Improved UE LE motor exam improved</td>
</tr>
<tr>
<td>3</td>
<td>4 mo</td>
<td>Return of urinary function Return of ambulation</td>
</tr>
<tr>
<td>4</td>
<td>2 mo</td>
<td>Normal exam</td>
</tr>
<tr>
<td>5</td>
<td>6 mo</td>
<td>Neurologically at baseline</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Surgery pending</td>
</tr>
</tbody>
</table>

Conclusions

- Aggressive spinal hemangiomas can extend outside the vertebrae into the epidural space
- Extraosseous extension of a spinal hemangioma may compress the spinal cord resulting in pain and/ or myelopathy
- Good surgical outcomes are possible with individualized treatment