Cervical spondylolysis with spondylolisthesis

Case report

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The authors describe a case in which cervical spondylolysis was found at multiple levels with spondylolisthesis and associated neurological deficits. Radiographic findings and the absence of history of trauma suggest a congenital etiology.

KEY WORDS: cervical spondylolysis • spondylolisthesis • spina bifida

Spondylolysis with spondylolisthesis of the lumbar spine is found in approximately 5% of the general population. It is observed most frequently at L-5, occasionally at L-4, but rarely above this level. Spondylolisthesis of the cervical spine was first reported by Perlman and Hawes in 1951. Six additional cases have since been reported; however, none of these patients had neurological deficits and all had defects at only one level.

We are reporting a case of multilevel defects of the pars interarticularis with spondylolisthesis and associated neurological deficits; we believe it is the first such case reported.

Case Report

A 46-year-old woman was admitted with progressive neck pain radiating down her left arm, and pain on rotation of her neck. There was no history of trauma, and the medical history and general examination were normal. Neurological examination revealed decreased strength of her left biceps and brachioradialis muscles with depression of associated reflexes. Pin perception was decreased over the left C-6 distribution. No pathological reflexes were demonstrated.

Plain cervical spine films showed smooth, well-corticated bilateral defects at the bone margins of the pars interarticularis at the levels of C3–5 with spondylolisthesis of C-5 on C-6. Paravertebral soft tissues were normal, and spina bifida was not present (Figs. 1 and 2). Instability was demonstrated on flexion and extension films. No significant abnormality was revealed by cervical myelography or electromyography. The patient underwent anterior cervical disc removal with interbody fusion at C5–6 without complications.

Discussion

Table 1 outlines the cases of cervical spondylolysis with spondylolisthesis reported in the English medical literature. Four patients
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Fig. 1. Radiographs of the cervical spine. Left: Anteroposterior view showing no evidence of spina bifida. Right: Lateral view. Defects of the pars interarticularis are noted at C3-5 (small arrows). The bone margins are smooth and well corticated. The height of the involved vertebral bodies is decreased. Spondylolisthesis is noted at C-5 on C-6 (large arrow).

Fig 2. Lateral tomograms of the cervical spine. Left: Smooth, well-corticated bone margins of the pars interarticularis defects can be seen at C3-5 on the right side (arrows). Right: Lateral tomogram of cervical spine shows smooth, well-corticated bone margins of the pars interarticularis defects at C3-5 on the left side (arrows).
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Age, Sex</th>
<th>Symptoms</th>
<th>Clinical Findings</th>
<th>Spondylolysis</th>
<th>Spina Bifida</th>
<th>Spondylolisthesis</th>
<th>Instability</th>
<th>Treatment</th>
<th>Follow-up</th>
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<tbody>
<tr>
<td>Perlman &amp; Hawes, 1951</td>
<td>19 M</td>
<td>neck pain</td>
<td>palpable step-off between C-5 and C-6 spinous process; pain on rotation of neck</td>
<td>bilateral C-6</td>
<td>C-6</td>
<td>C-6 on C-7</td>
<td>not mentioned</td>
<td>not mentioned</td>
<td>free of symptoms after 6 yrs</td>
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<tr>
<td>Durbin, 1956</td>
<td>25 M</td>
<td>neck pain and stiffness</td>
<td>right torticollis, pain on rotation of neck</td>
<td>bilateral C-4</td>
<td>C-4</td>
<td>C-4 on C-5</td>
<td>C-4 on C-5</td>
<td>posterior spinal fusion</td>
<td>employed as brick layer 3 mos postoperatively</td>
</tr>
<tr>
<td>Op Den Orth, et al., 1969</td>
<td>41 M</td>
<td>neck and left shoulder pain</td>
<td>no neurological abnormalities</td>
<td>unilateral C-6</td>
<td>none</td>
<td>not mentioned</td>
<td>not mentioned</td>
<td>cervical traction, muscle relaxants, physical therapy</td>
<td>not mentioned</td>
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<tr>
<td>Dawley, 1971</td>
<td>11 F</td>
<td>neck discomfort when head held erect</td>
<td>one noted neck pain following a football game</td>
<td>bilateral C-6</td>
<td>C-6</td>
<td>C-6 on C-7</td>
<td>C-6 on C-7</td>
<td>anterior interbody fusion</td>
<td>not mentioned</td>
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<tr>
<td>Cautilli, et al., 1972</td>
<td>15 M (twins)</td>
<td>neck pain</td>
<td>spasm of right sternomastoid and trapezius muscles, pain on rotation of neck, no neurological abnormalities</td>
<td>elongation of C-6 pars inter-articularis, (the radiographic findings apply to both twins, neither had neurological abnormalities)</td>
<td>C-6</td>
<td>C-6 on C-7</td>
<td>not mentioned</td>
<td>skull traction for 2 wks</td>
<td>15 mos after diagnosis, radiographs unchanged, neurological examination negative</td>
</tr>
<tr>
<td>Azouz, et al., 1974</td>
<td>34 M</td>
<td>neck pain</td>
<td>pain on rotation of neck, no neurological abnormalities</td>
<td>bilateral C-6</td>
<td>C-6</td>
<td>C-6 on C-7</td>
<td>none</td>
<td>not mentioned</td>
<td>not mentioned</td>
</tr>
<tr>
<td></td>
<td>45 F</td>
<td>neck pain</td>
<td>pain on rotation of neck, no neurological abnormalities</td>
<td>unilateral C-6</td>
<td>C-6</td>
<td>not mentioned</td>
<td>not mentioned</td>
<td>not mentioned</td>
<td>not mentioned</td>
</tr>
<tr>
<td></td>
<td>38 M</td>
<td>occipital headache</td>
<td>no neurological abnormalities</td>
<td>unilateral C-4</td>
<td>C-4</td>
<td>none</td>
<td>not mentioned</td>
<td>not mentioned</td>
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had bilateral spondylolysis, three had varying unilateral involvement, and two had only elongation of the pars interarticularis. The prevalent site of involvement appears to be C-6 with only two cases involving another level, C-4. Most cases occurred in males (seven of nine patients). Although trauma was a precipitating factor in several cases, the radiographs revealed well-corticated margins at the pars interarticularis defect. All cases with spondylolysis except one were associated with spina bifida. No neurological abnormality was present in any of the reported cases. These findings suggest a congenital etiology, or at least the presence of the lesion from an early age. Patients with unilateral spondylolysis did not have spondylolisthesis. Patients with bilateral involvement and instability underwent spinal fusion and attained a satisfactory level of stability.

Our case is unique in having bilateral defects in the pars interarticularis at levels C3-5, with neurological deficits manifested by motor and reflex changes.

References


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