Case 5

62-year-old man from Eastern Asia presented with a broad based gait; recurrent falls. Neurological assessment suggested upper motor lesion in the lower limbs.

Your Diagnosis?
Diagnosis: Ossification of the Posterior Longitudinal Ligament

The radiologic findings of ossification of the posterior longitudinal ligament, in the absence of additional abnormalities such as degeneration, erosion, or bone destruction or ossification of anterior longitudinal ligament, are specific for this diagnosis.

The exact aetiology is not known. A male predominance exists and symptoms peak in the sixth decade of life. In addition, a systematic review by Saetia reported an incidence of ossification of the posterior longitudinal ligament ranging from 0.16% to 2.4%.

Treatment for ossification of the posterior longitudinal ligament may be conservative, through serial observation, or surgical depending on the severity of symptoms.

Introduction

1921 Key reported OPLL as "calcification" of spinal cord compression caused by disease.
960 Tsukimoto autopsy confirmed that due to ossification of posterior longitudinal ligament.
OPLL (OPLL) more common in East Asian countries.
OPLL is roughly linear relationship with age, 51 to 60 years old
Thoracic, lumbar OPLL is rare.
OPLL of the etiology and pathogenesis is not fully understood. It is not related to cervical spondylosis.
Many scholars have referred to the endocrine disorder may be associated with OPLL. According to a group of 535 cases of OPLL patients glucose tolerance test results confirmed that 152 cases (28%) had diabetes, 95 cases (18%) had suspected diabetes; the other hand, the incidence of diabetes of up to 16% of OPLL other endocrine disorders such as acromegaly and patients with hyperparathyroidism, OPLL incidence is higher. It was also reported, OPLL patients intestinal calcium absorption is reduced.

OPLL patients the incidence is 30% in the presence of family history, suggesting that there may be autosomal dominant.

The main component of bone OPLL is lamellar of bone, accompanied by some irregular woven bone and calcified cartilage. The formation is due to endochondral ossification.

OPLL patients with autopsy confirmed severe anterior spinal cord compression. Anterior and posterior horn cells are reduced with extensive demyelination.

Although OPLL causes spinal cord compression, the stability of spine is retained. The antero-posterior diameter of spinal canal can be decreased to 50%. OPLL patients showed symptoms of sudden onset of severe paralysis of the limbs.
According to a 2162 analysis of symptoms and signs:

- Pain in the neck: 42%,
- Upper limb pain/sensory loss: 48%,
- Upper limb movement disorder: 10%,
- Lower extremity sensory loss: 20%,
- Lower extremity motor: 15%,
- Bladder dysfunction: 1.0%.

OPLL myelopathy: Usually insidious signs and symptoms of cord. In 20% of the patients, because of the sudden trauma of mild to moderate quadriplegia may be present.

(1) **cervical spine X-ray**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td>The ligament behind the intervertebral space;</td>
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<tr>
<td>II</td>
<td>Segmental - the ligament behind the vertebral body</td>
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<tr>
<td>III</td>
<td>Continuous - a number of vertebral ligament</td>
</tr>
<tr>
<td>IV</td>
<td>Mixed - segmental and continuous mixing</td>
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(2) CT

It also measures thickness, width and degree of spinal canal stenosis.

Sagittal, reformatted CT image shows ossification of the posterior longitudinal ligament from C2 through C5. Axial noncontrast CT scan shows the ossified ligament impinging on the spinal canal.

(3) CT myelography
(4) MRI

Shows signal changes suggesting cord myelopathy.

(5) Electrophysiology

Differential diagnosis

(1) Cervical spondylosis

Clinical manifestations of cervical spondylosis and spinal cord are similar.

Usually spondylosis is more common at C5/6 and C6/7 whereas OPLL is more in upper cervical spine.

X-ray and CT are helpful in differentiating two conditions.

(2) Ankylosing spondylitis

Is also a proliferative spondyloarthropathy that can be associated with ossification of the posterior longitudinal ligament, ossification of the annulus fibrosis, anterior longitudinal ligament, and smooth flowing marginal syndesmophytes also exist, in
addition to erosive/ankylosing arthropathy of facet articulations

3) Ankylosing hyperostosis

is a proliferative enthesopathy that may manifest with ossification of the posterior longitudinal ligament and preferentially involves the cervical and thoracic spine, a distribution similar to ossification of the posterior longitudinal ligament. However, the hallmark of diffuse idiopathic skeletal hyperostosis is proliferation and ossification of the anterior longitudinal ligament, often resulting in multilevel ankylosis.

4) Rheumatoid arthritis: Cervical involvement in rheumatoid arthritis can be indicated by erosive arthropathy of the C1-C2 articulation, abnormal pre-dental interval due to ligamentous disruption, and synovial inflammation and pannus with enhancing soft tissue.

5) Calcium pyrophosphate deposition

The more typical manifestations result in small mineralized masses caudal to the anterior arch of C1 and calcification of the stabilizing ligaments at the C1–odontoid articulation, rather than frank ossification of the posterior longitudinal ligament. A mineralized hard disk can be seen.

**Treatment**

(1) Non-surgical treatment

Bed rest, wearing the neck collar, skull traction, designed to avoid or reduce the irritation caused by activity modification.
Only 26.7% improved, 54.8% valid, 18.5% increase.

(2) surgical treatment
Where there is significant spinal cord compression symptoms surgery may be indicated: either  Anterior decompression and bone grafting or a Posterior approach: laminectomy and decompression.