Ossification of the Posterior Longitudinal Ligament Associated With Rheumatoid Arthritis

SATOSHI NOZAWA, MD; KEI MIYAMOTO, MD, PHD; YASUMICHI SAKAGUCHI, MD, PHD; HIDEO HOSOE, MD, PHD; KATSUJI SHIMIZU, MD, DMSc

Rheumatoid arthritis frequently affects the cervical spine. Among the rheumatoid changes in the cervical spine, atlantoaxial joint subluxation and subaxial subluxation are commonly encountered.\textsuperscript{1,2}

This article presents a patient with ossification of the posterior longitudinal ligament and rheumatoid arthritis.

CASE REPORT

A 50-year-old woman previously presented with bilateral wrist pain and was treated for rheumatoid arthritis. Two years later, she presented with bilateral upper extremity numbness of 1 year’s duration.

On neurological examination, hyperactive deep tendon reflexes were noted in both upper limbs as well as hypesthesia from the C5 to C8 dermatome. Manual muscle test of the deltoid and biceps muscles showed some weakness on both sides. Positive Babinski signs and ankle clonus were observed bilaterally. The patient satisfied the American Rheumatism Association 1987 revised criteria, grade stage I, class 2 (Figure 1).\textsuperscript{3,4}

Laboratory data revealed a C-reactive protein level of 2.5 mg/dL, an erythrocyte sedimentation rate of 15 mm/hr, and positive rheumatoid factor.

Plain radiographs of the cervical spine revealed ossification of the posterior longitudinal ligament (Figure 2). Computed tomography (CT) myelogram and magnetic resonance imaging (MRI) showed spinal cord compression by continuous-type cervical ossification of the posterior longitudinal ligament at C3 to C6 (Figures 3 and 4). Cervical ossification of the posterior longitudinal ligament was the cause of myelopathy.

Anterior decompression was performed by a 4-level corpectomy from C3 to C6, excision of the ossification of the posterior longitudinal ligament, and placement of a fibular strut graft between C2 and C7 (Figure 5). External skeletal fixation was applied postoperatively with a halo vest for 3 months.

Immediately postoperatively, upper limb...
numbness decreased. Two years postoperatively, the anterior fibular graft fused and neurologic symptoms disappeared (Figure 6). However, 3 years postoperatively, in contrast to the patient’s uneventful postoperative course, rheumatoid arthritis symptoms worsened, with severe morning stiffness and polyarthralgia, which was treated with an oral dose of prednisolone (5 mg/day).

**DISCUSSION**

Destructive changes of the enthesis in rheumatoid arthritis are striking in contrast to ossification of the enthesis. Only two studies have described the etiology and incidence of ossification of the posterior longitudinal ligament in patients with rheumatoid arthritis.5,6 The incidence was reported as 4.8% (4/83) by Koshizuka et al5 and 1.4% (7/500) by Sakurai et al.6 Although their results suggest that ossification of the posterior longitudinal ligament is not a rare pathological condition, neither of these authors reported any case of rheumatoid arthritis in which the typical myelopathy was caused by ossification of the posterior longitudinal ligament.

Thus far, surgical treatment of ossification of the posterior longitudinal ligament in patients with rheumatoid arthritis has not been discussed in the literature. As described in our case, anterior decompression by multilevel corpectomy and fibular strut grafting was used, as opposed to posterior decompressive surgery with laminoplasty. We presumed that laminoplasty would not guarantee satisfactory results for the patient. If atlantoaxial instability emerged after performing laminoplasty, it would be difficult to stabilize it with a transarticular screw using Magerl’s screw technique in the presence of a transformed C3 lamina. In addition, we chose anterior multi-level fusion to prevent the progression of subaxial subluxation. Furthermore, the cause of the compression itself was located anteriorly to the spinal cord, and progression of the rheumatoid arthritis or the ossification of the posterior longitudinal ligament was unpredictable. Anterior decompression and excision of the ossification of the posterior longitudinal ligament that would address these problems simultaneously.

One possible drawback of this approach in patients with rheumatoid arthritis vertebral bodies is penetration of the anterior fibular strut graft due to osteopenia. However, in our patient, rheumatoid arthritis duration was brief, with satisfactory bone quality. In addition, a halo vest was applied to ensure sufficient external fixation.

Although short-term surgical outcome in this patient was satisfactory, follow-up examinations should continue indefinitely to assess the development of rheumatoid arthritis and any changes in the anteriorly fused cervical spine. Particular attention is paid to the fact that the only mobile intervertebral segment in the patient is the atlantoaxial region, which is subject to a considerable load. If the atlantoaxial region develops instability due to rheumatoid arthritis, the patient may require further surgical treatment such as atlantoaxial fusion using Magerl’s screw technique.

**REFERENCES**