

## Radiology images

# Thoracic myelopathy due to ossified hypertrophied ligamentum flavum

Jaisuresh K<sup>\*,§</sup>, Vinodh Kumar P<sup>\*</sup>, Sundaravadivelu V<sup>\*\*</sup>

\*Postgraduate Resident, Department of Internal Medicine, Madras Medical College, Chennai,\*\*Professor, Institute of Internal Medicine, Madras Medical College, Chennai. § Corresponding Author. E-mail: [drjaisuresh@gmail.com](mailto:drjaisuresh@gmail.com)

## ABSTRACT

Calcification of ligamentum flavum is a rare disease that was found to occur almost exclusively in Japanese population. However the disease is now being increasingly recognized as a cause of thoracic myelopathy in Indian Population. We report a case of thoracic myelopathy at multiple levels due to Ossified and hypertrophied ligamentum flavum.

**Key words:** ligamentum flavum hypertrophy, myelopathy.

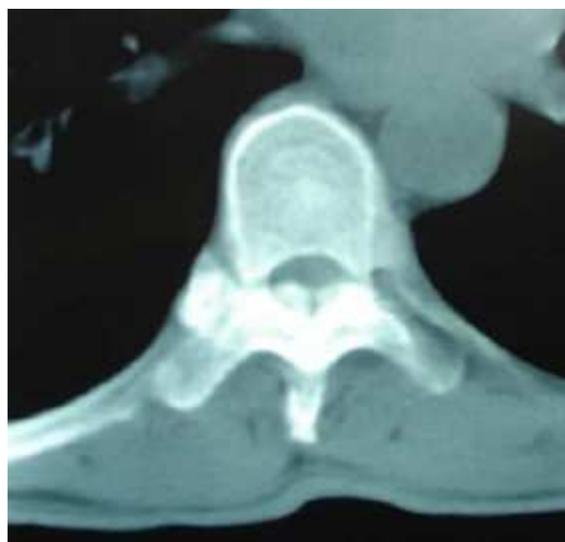
## CASE SUMMARY:

43yr old male presented with three months history of numbness and progressive spastic weakness of both lower limbs. His neurological examination revealed spastic paraparesis with exaggerated knee and ankle jerks and positive Babinski sign in both lower limbs. Sensory system examination revealed decrease in all modalities of sensation below T12 level. His bladder function and anal tone were normal. Biochemical investigations including serum calcium (9.1; normal: 8.6-10.3mg/dl), phosphate (3.9mg/dl; 2.5-4.5mg/dl), parathyroid hormone (24pg/ml; normal: 12-72pg/ml), alkaline phosphatase (58IU/L; Normal: 38-126IU/L), fluoride (0.4 ppm) were within normal range. X-rays of Spine and chest did not show any abnormality. CT (Figure 1) and MRI (Figure 2) revealed narrowing of Spinal canal and thoracic cord compression at multiple levels due to ossification and hypertrophy of ligamentum flavum.

## DISCUSSION:

The ligamentum flavum (LF) is a yellow elastic ligament extending from second cervical vertebra to the first piece of sacrum. The ligament is in the dorsal portion of the spinal canal, attaching the laminae and extending to the capsules of the facet joints and the posterior aspects of the neural foramina. Thoracic myelopathy due to ossified LF was described in 1964 by Yamaguchi and Isuruni. The pathogenesis of ossified ligaments is not clear. Etiology of ossification of LF include trauma, diffuse idiopathic skeletal hyperostosis (DISH), ankylosing spondylosis, hemochromatosis, fluorosis and disorders of calcium and Phosphorous. However etiology remains unknown in most of the cases. Of the 15 Cases reported by Jayakumar et al etiology has remained obscure in 12 patients. The proposed mechanisms<sup>4</sup>

include mechanical stress of the lower thoracic spine and the thoracolumbar junction, causing yellow ligament degeneration, ossification along the superficial layer of the hypertrophied yellow ligaments, an increased number and size of collagen fibers, as well as premature osteons or osteoblasts.



**Figure 1:** Thoracic CT scan –axial view showing “V” shaped hyper density in the dorsal aspect of spinal canal. This is characteristic of ossification of ligamentum flavum.

The ligamentum flavum can contribute by hypertrophy or ossification to spinal stenosis, most often in the lower thoracic or lumbar spine, affecting the cord or cauda equina. The condition may be asymptomatic, however, in patients with a stenotic spinal canal or with large calcifications, it may cause compression of the spinal cord. Numbness in the lower limbs is the most common initial symptom of thoracic myelopathy. All patients have motor weakness in lower extremities and difficulty in walking. Root pain and stiffness are not usually seen. Bladder disturbance is seen only in late stages.

CT remains the investigation of choice to demonstrate ossification. Spinal MRI shows hypertrophy of ligamentum flavum causing spinal cord compression. Lateral radiograph can show ossified ligaments in some patients. Thoracic cord compression at multiple levels is very rare. 2 of the 15 patients reported by

Jayakumar et al showed spinal cord compression at two different levels. Our patient had cord compression at five different levels (T3-T4, T6-T7, T8-T9, T9-T10, T10-T11 Levels).



**Figure 2:** Saggital T2 weighted MRI of thoracic spine showing thoracic canal stenosis at multiple levels. Ossified ligamentum flavum is seen as hypointensities in the dorsal aspect spinal canal.

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