



Syringomyelia Secondary to Thoracic Intervertebral Disc Protrusion: A Rare Condition

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Spinal spondylosis is an extremely common problem among the middle-aged and elderly population. However, it is an extremely rare cause of syringomyelia in clinical practice. The differentiation between syringomyelia and hydromyelia is not always straightforward and rather exhaustive. Spinal cord compression and instability are the proposed mechanisms of injury-causing syringomyelia. Symptomatic presentation depends primarily on the location of the syrinx within the neuraxis, be it motor, sensory or autonomic disturbance. There were abundant of successful cases in the past, whereby surgical interventions can regress the appearance of syringomyelia in magnetic resonance imaging. However, there was a mixed result in terms of patients' symptom. There were only 6 reported articles of syringomyelia secondary to cervical spondylosis found worldwide. We describe a case of T11/T12 thoracic intervertebral disc protrusion causing long segment syringomyelia till conus medullaris.

Key words: Syringomyelia, hydromyelia, syrinx, disc protrusion

INTRODUCTION

Spinal spondylosis is an extremely common problem among the middle-aged and elderly population. However, it is an extremely rare cause of syringomyelia in clinical practice. In general, syringomyelia refers to the cystic collection in the spinal cord surrounding the central canal and it is not lined by an ependymal lining. On the other hand, hydromyelia is defined as persistent dilatation of the central canal of the spinal cord which communicates with the fourth ventricle and lined by normal ependymal tissue. Distinguishing between the two on imaging is difficult and exhausting. Hence, the term "syrinx or hydrosyringomyelia" can be used to describe this fluid accumulation within the cord.¹ Approximately 90% of syrinx are due to congenital causes which include myelomeningocele, Chiari I/II malformation, Dandy-Walker malformation, and Klippel-Feil syndrome. There are only 10% of syrinx are attributed to secondary causes for instance posttraumatic, postinflammatory, intramedullary tumor, and vascular insufficiency.

CASE REPORT

A 36-year-old healthy man presented to the emergency department complaining of spontaneous onset of severe low back pain for 3 days' duration which intensify on the day of presentation. The pain was radiating to his left leg, however, no muscle weakness or numbness noted. No bowel or urine incontinence noted as well. There was no history of trauma or similar complaint in the past. On examination, the straight leg test was positive at 40° on the left leg. Otherwise, the sensation, power, and reflexes of bilateral lower limbs were normal. He was scheduled to an outpatient magnetic resonance imaging (MRI) of lumbosacral spine within a week that was then converted to MRI thoracolumbar spine to trace the source of syrinx. MRI revealed loss of normal lumbar lordosis with normal bony alignment. The T2-weighted sequence demonstrates a well-defined hyperintense signal cystic collection within the spinal cord from T12 vertebral level extending to the conus medullaris suggestive of

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syrinx [Figures 1 and 2]. The affected lower thoracic spinal cord was expanded. At T11/T12 level, there was a small left paracentral disc protrusion indenting the spinal cord [Figure 3] which was believed to be the cause of the syringomyelia. Otherwise, there was no evidence of bone marrow edema or prolapse intervertebral disc elsewhere. Unfortunately, our patient is not keen for any surgical intervention at the moment and opts for conservative treatment.

DISCUSSION

Syringomyelia is a very complicated condition with multifactorial and a variety of proposed mechanism of syrinx formation. No one single theory can cover all instances. Symptomatic presentation depends primarily on the location of the syrinx within the neuraxis. The patient can present with sensory symptom when the syrinx interrupts the decussating spinothalamic fibers that mediate pain and temperature sensibility. If the syrinx involves the anterior horn of the spinal cord, this will damage the motor neuron resulting in muscle atrophy and weakness. Impaired bowel and bladder functions ultimately occur as a late manifestation and immediate surgical intervention is needed.

Up to date, there are only 6 reported articles of syringomyelia secondary to cervical spondylosis found worldwide through literature reviewed using PubMed database. Literature searches have shown extremely rare incidence of syringomyelia associated with thoracic disc protrusion/herniation as in our case. Spinal cord compression and instability are the proposed mechanisms of injury-causing syringomyelia. In the literature review executed by Landi *et al.* postulated that cervical instability causes microtrauma

toward the spinal cord and subsequent parenchymal damage. This resulting in myelomalacia and finally the formation of syrinx. Apart from that, hemorrhage within the central cord can cause cerebrospinal fluid (CSF) outflow obstruction give rise to syrinx. The stenotic elements can obstruct the flow of CSF in cervical spondylosis, these elements rub toward the spinal cord during neck movement causing arachnoiditis, subarachnoid hemorrhage, and adhesion.³

In Levine's study of the origin of the syringomyelia, he described subarachnoid obstruction resulting in increased CSF pressure above the block compared with below generating a transmural hydrostatic effect. This mechanical compression onto the spinal cord disrupts the blood–brain barrier which raised the intravascular pressure resulting in ultrafiltration of crystalloids and fluid accumulation.⁴ Contrast-enhanced sequences have always been a dilemma in case of syringomyelia. T2-weighted imaging alone without the need of contrast-enhanced imaging has achieved 100% reader sensitivity and negative predictive value in evaluating for a syrinx-associated mass.⁵ Even the presence of irregular internal septation and size of syrinx do not warrant contrast-enhanced imaging. However, the prerequisite for this theory to stand should lie on the MRI scanner in producing high-quality images. Careful scrutinizing of the T2 sagittal and axial planes is adequate to determine the cause of syrinx formation. There were abundant of successful cases in the past, whereby surgical interventions can regress the appearance of syringomyelia. However, there was a mixed result in terms of patients' symptoms. Some patients still experience motor deficit even after surgery, whilst others show a promising result. Ultimately, surgical decompression by enlarging the spinal canal prevent stenotic element rubbings towards the spinal cord and spinal stabilization are the two mainstay treatments.



Figure 1: Sagittal T2-weighted magnetic resonance imaging revealed a well-defined hyperintense signal cystic collection within the spinal cord from T12 vertebral level extending to the conus medullaris suggestive of syrinx. The affected spinal cord is expanded

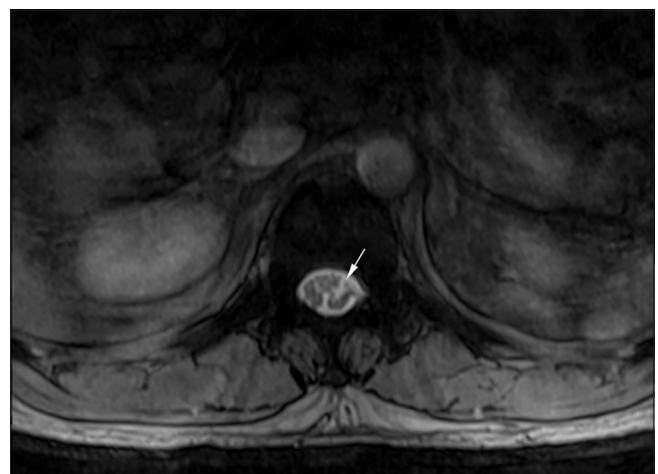


Figure 2: Axial T2-weighted magnetic resonance imaging at T12 vertebral level revealed the occurrence of syrinx within the lower thoracic spinal cord more on the left hemi-cord (white arrow)



Figure 3: At T11/T12 level which is immediately above the beginning of syrinx, the axial T2-weighted magnetic resonance imaging revealed the left posterolateral disc protrusion (white arrow) indenting the spinal cord. No nerve impingement or significant spinal canal stenosis

CONCLUSION

Despite the rare incident of syringomyelia secondary to disc protrusion, it is an important and preventable cause in the context of acute event to halt disease progression. Although patients with syringomyelia are usually managed conservatively, surgical treatments should be contemplated on a case-to-case basis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Data availability statement

The data that support the findings of this study are available from the corresponding author, ST Hui, upon reasonable request.

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Conflicts of interest

There are no conflicts of interest.

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