

 **IMAGES OF SPINE CARE**

Identification of arachnoid web with a relatively novel magnetic resonance imaging technique

Arachnoid webs are described as intradural extramedullary transverse bands of arachnoid tissue that extend to the dorsal surface of the spinal cord, causing mass effect and dorsal indentation, and they are often associated with syringomyelia [1]. Although the precise mechanism of syrinx formation is unknown, dissection of the arachnoid web shrinks the syrinx and improves the symptoms [2,3]. Arachnoid webs are not easily visualized with conventional magnetic resonance imaging (MRI) or computed tomography (CT) myelography because of their comparatively thin width relative to other structures [2]. Other institutions have described the use of cardiac-gated phase-contrast cine-mode MRI in multiple axial planes to better identify these entities radiographically [2]. We report the use of a heavily T2-weighted constructive interference in steady state (CISS) sequence to identify these lesions preoperatively.

A 65-year-old man presented with worsening gait imbalance and exhibited evidence of myelopathy on physical examination. He had two significant neck injuries in his medical history, but was never diagnosed with a cervical fracture.

We performed an MRI of the cervical spine that revealed an abnormal T2 hyperintensity within the lower cervical and upper thoracic spinal cord, from C6/C7 to T2 (Fig. 1). This was thought to reflect a combination of syrinx and either spinal cord edema or myelomalacia. There was also a focal

deformity of the thoracic spinal cord at the T2 level dorsally. The thoracic spinal cord at the T1–T2 level was positioned abnormally ventrally within the thecal sac, with focal curvilinear density identified posteriorly that was believed to be a thoracic dorsal arachnoid cyst.

For further identification of the focal deformity, we performed a myelogram with postmyelopathic CT (Fig. 2). This revealed complete and immediate opacification of the subarachnoid space up to the T1 level, which excluded the possibility of an arachnoid cyst. However, there was a transient holdup of contrast at the cervicothoracic junction that appeared to be related to a narrowing of the dorsal subarachnoid contrast column. We noted a subtle differential contrast density above and below T2 on the sagittally reconstructed post-myelographic CT images. Although there were no direct findings of a membrane, these findings were suggestive of a dorsal arachnoid web. Thus, we ordered a repeat MRI with CISS sequences (Fig. 3). This set of imaging revealed a transversely oriented arachnoid membrane, extending from the posterior dura to the pial margin of the cord, which is consistent with an arachnoid web. The patient underwent a T1–T2 laminotomy, and a thick arachnoid web was visualized and resected (Fig. 4). At this point, pulsatile flow was restored to the spinal cord. The patient was ambulating and significant improvement was noted in his gait by postoperative Day 2.

“Idiopathic” syringomyelia could be secondary to the presence of an arachnoid web. An increased suspicion of the presence of an arachnoid web should arise if a CT myelogram demonstrates any decrease in the flow or dorsal indentation of the spinal cord. T2-weighted CISS sequence is a useful tool to

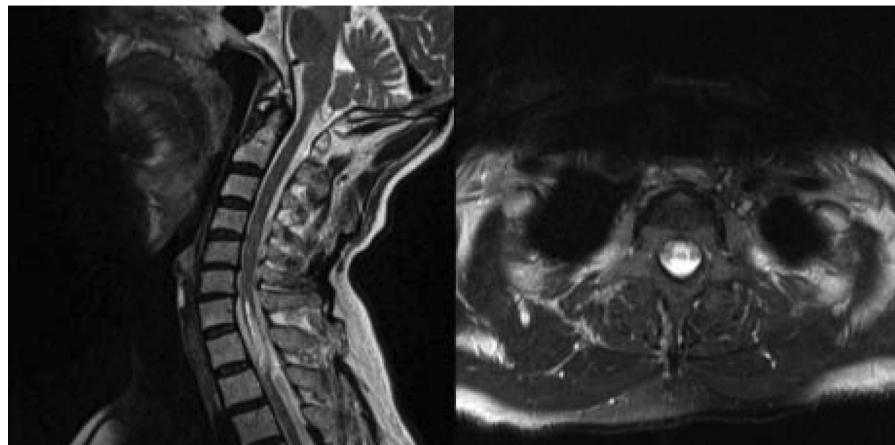


Fig. 1. Magnetic resonance imaging (MRI) of cervical spine. (Left) Sagittal T2-weighted MRI that reveals a syrinx from the C6–C7 level to the T2 level. (Right) Axial T2-weighted MRI that reveals ventral migration of the spinal cord with intramedullary T2 signal change.

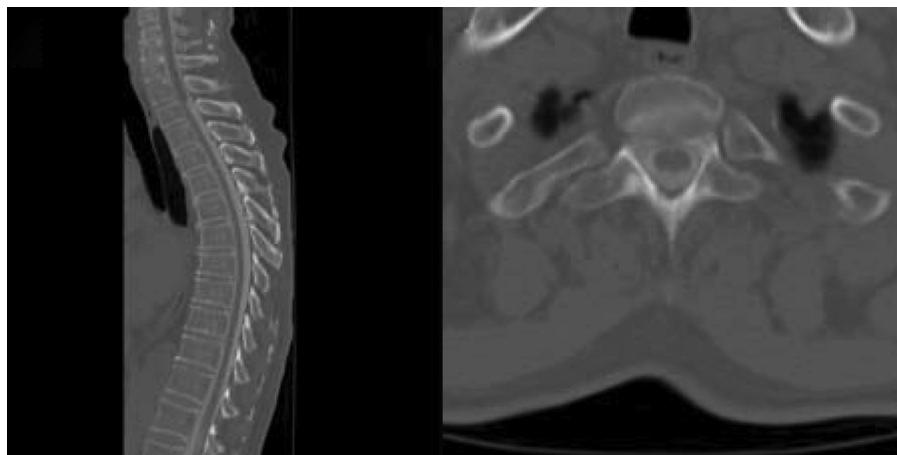


Fig. 2. (Left) Sagittal and (Right) axial computed tomography myelogram images concerning for an obstructive membrane at the level of the superior end plate of T2.

further clarify the level of cerebrospinal fluid flow obstruction and assist in preoperative planning.

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Acknowledgments

The authors would like to thank Victoria L. Jackson, MLIS, ELS, (Academic and Research Support, Mayo Clinic, Jacksonville, FL, USA) for her editorial assistance in the preparation of this manuscript.

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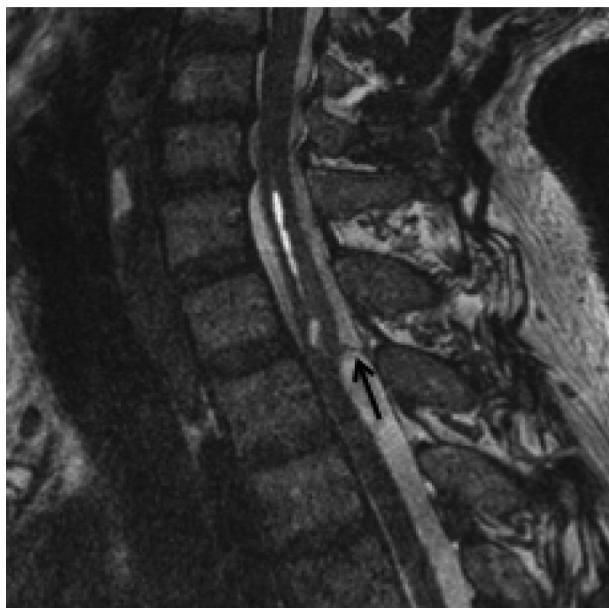


Fig. 3. Sagittal constructive interference in steady state sequence, with arrow pointing to the dorsal arachnoid web at the superior end plate of T2.

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FDA device/drug status: Not applicable.

Author disclosures: **SSG:** Nothing to disclose. **SMP:** Nothing to disclose. **PGV:** Nothing to disclose. **VG:** Nothing to disclose.

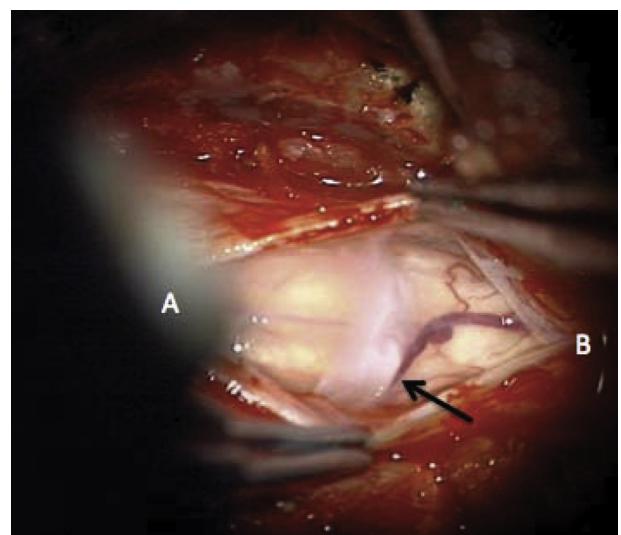


Fig. 4. Intraoperative image under microscopic guidance showing a thick arachnoid web (arrow). (A) Cranial; (B) caudal.