

Medical Image

Time-SLIP Reveals Intramedullary Flow in Syringomyelia

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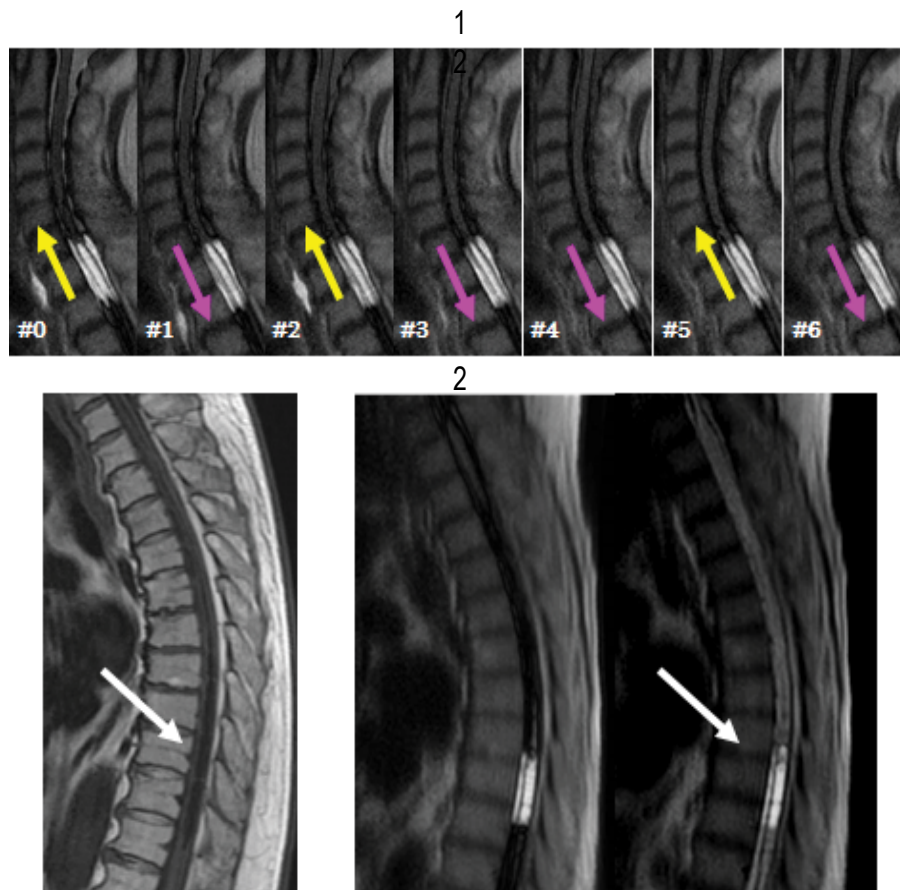


Figure 1: Pulsatile flow motion in the cranio-caudal direction (Cranial motion: #0, #2, #5/Caudal: # 1, 3, 4, 6).
Figure 2: Communication between compartments within syringomyelia. A: T1 WI, B and C: T10.

Case Presentation

Magnetic resonance imaging (MRI) using a time-spatial labeling inversion pulse (Time-SLIP) method permits visualization of cerebrospinal fluid (CSF) dynamics noninvasively. Time-SLIP enables quantitative and qualitative CSF flow analysis without any limitations in flow velocity or direction. An 85-year-old old male: Syringomyelia (C7-T12) Conventional MRI revealed syringomyelia with multiple syrinx cavities. Time SLIP can detect the CSF flow dynamics in both the intra- and peri-spinal cord simultaneously. The basic CSF flow pattern in the syringomyelia cavity was pulsatile motion in the Cranio-caudal direction and harmonious with the flow in subarachnoid space (Figure 1). Time-SLIP also detected over flow through septum or web. The unique flow across the intramedullary compartments indicated several paths throughout the septum of syrinx (Figure 2).

These findings may improve our understanding of disease pathology of syringomyelia and be useful in surgical planning.

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Citation: Takeuchi K (2016) Time-SLIP Reveals Intramedullary Flow in Syringomyelia. *Int J Clin Med Imaging* 3: 531. doi:10.4172/2376-0249.1000531

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MRI imaging technique

1.5-T MR imager with quadrature-detected phased-array coils Sphygmographic gated single-shot half Fourier fast spin-echo (FSE) sequence.

Representative imaging parameters

TR: 12–13P–P intervals, TE: 80 msec, BBTI: 1500–4400 msec (100 msec interval), Tag pulse thickness: 30 mm, ETS 6.5 msec, MTX: 256 × 288, FOV: 25 × 25 cm, Slice thickness 5 mm.