

Accepted Manuscript

Redundant Nerve Root Syndrome of the Cauda Equina: The benefits of 3D CISS MRI Sequence

Alaaddin Nayman, MD, Seda Ozbek, Assoc. Prof. Dr.



PII: S1529-9430(15)00543-4

DOI: [10.1016/j.spinee.2015.05.021](https://doi.org/10.1016/j.spinee.2015.05.021)

Reference: SPINEE 56343

To appear in: *The Spine Journal*

Received Date: 23 April 2015

Revised Date: 3 May 2015

Accepted Date: 19 May 2015

Please cite this article as: Nayman A, Ozbek S, Redundant Nerve Root Syndrome of the Cauda Equina: The benefits of 3D CISS MRI Sequence, *The Spine Journal* (2015), doi: [10.1016/j.spinee.2015.05.021](https://doi.org/10.1016/j.spinee.2015.05.021).

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Redundant Nerve Root Syndrome of the Cauda Equina: The benefits of 3D CISS MRI Sequence

Alaaddin Nayman, Seda Ozbek

Selcuk University, Faculty of Medicine, Department of Radiology, Konya, Turkey

Corresponding Author: Alaaddin Nayman, MD

Selcuk University, Faculty of Medicine

Department of Radiology, 42080

Konya-Turkey

e-mail: naymanalaaddin@hotmail.com

Tel :+ 90 332 241 15 50

Fax: :+ 90 332 241 60 65

1 **Redundant Nerve Root Syndrome of the Cauda Equina:**2 **The benefits of 3D CISS MRI Sequence**

3

4 A 58-year-old woman presented with progressive lumbargia. Conventional lumbar
 5 vertebra magnetic resonance imaging (MRI) showed tortuous structures like vascular
 6 malformations located cauda equina fibers with narrow lumbar spinal canal findings. After
 7 than, a three-dimensional (3D) constructive interference in steady state (CISS) sequence
 8 images were obtained. Thanks to its high spatial resolution (SR), 3D CISS sequence images
 9 showed the continuity of cauda equina nerve roots (Fig) in this region. These findings are
 10 consistent with redundant nerve root syndrome of cauda equina. SR constitutes one of the
 11 major problems and objectives in spinal imaging (1). The high SR can be obtained by this
 12 sequence and 3D CISS provide detailed information about anatomic structures. Confusing and
 13 subtle abnormalities of the spine are more fully clarified by using 3D CISS (1-4).

14

15

16 **References:**

- 17 1) Kulkami M. Constructive interference in steady-state/FIESTA-C clinical applications
 18 in neuroimaging. Journal of medical imaging and radiation oncology, 2011, 55(2):
 19 183-190.
- 20 2) Ramli N, Cooper A, Jaspan T. High resolution CISS imaging of the spine. The British
 21 journal of radiology, 2001, 74(885): 862-873.
- 22 3) Algin O, Hakyemez B, Gokalp G, Ozcan T, Korfali E, Parlak M. The contribution of
 23 3D-CISSL and contrast-enhanced MR cisternography in detecting cerebrospinal fluid
 24 leak in patients with rhinorrhoea, British journal of radiology, 2010, 83(987): 225-232.
- 25 4) Yoshino N, Akimoto H, Yamada I, Nagaoka T, Tetsumura A, Kurabayashi T, Honda
 26 E, Nakamura S, Sasaki T. Trigeminal Neuralgia: Evaluation of Neuralgic
 27 Manifestation and Site of Neurovascular Compression with 3D CISS MR Imaging and
 28 MR Angiography 1. Radiology, 2003, 228(2): 539-545.

29 **Figure Legend**

30 **Fig.** Sagittal T2 weighted image (a) shows tortuous structures like vascular malformations
31 located cauda equina fibers with narrow lumbar spinal canal findigs. Sagittal (b) CISS
32 sequence image shows continuity of elongated tortuous cauda equina nerve roots in this
33 region.

