

The Craniocervical Syndrome and MRI

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Editors

Francis W. Smith London

Jay S. Dworkin Melville, N.Y.

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Prof. Francis W. Smith

Medserena Upright MRI Centre
114a Cromwell Road
London SW7 4ES (UK)
E-Mail franciswsmith@hotmail.com

Dr. Jay S. Dworkin

FONAR Corporation
110 Marcus Drive
Melville, NY 11747 (USA)
E-Mail dworkin.fonar@icloud.com

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Foreword

Rapid advances in diagnostic imaging technology have made us all more dependent on MRI images. It is, however, crucial to remember that we treat the patient and not the image. Frequently, the patient will tell us what is wrong if we ask the right questions. This monograph recognizes these observations as particularly germane when examining the implications of abnormalities and injury to the craniocervical junction.

There is a broad range of symptoms comprising what can rightly be referred to as the craniocervical syndrome. It should come as no surprise that the anatomy in the location of the craniocervical junction plays a pivotal role. There one will find subtle anatomy with the numerous ligaments holding everything together all running into each other. The myodural bridge, atlanto-occipital joint, dura mater holding the brain inside the cranium and the alar ligaments that join the peg to the base of the skull can now be readily identified utilizing the correct MRI equipment and appropriate pulse sequences.

We need to be vigilant and look in more detail at what has been truly damaged in these areas. Subtle details we either oversee or we ignore because we do not fully understand what has happened often go underreported in MRI exams. For instance, if you know what you are looking for, you can appreciate changes in the MRI appearance of the smaller ligaments rather than concentrate on just the larger ligaments, intervertebral discs, fractures and hemorrhage around the longitudinal ligaments. Venous drainage is different in recumbent and upright MRI scans; for in-

stance, when lying down, the jugular vein appears larger because it does not drain as fast as when the patient is upright. Upright MRI also provides the decisive utility of cerebrospinal fluid flow studies around the craniocervical junction that are yielding insight into neurodegenerative diseases such as multiple sclerosis. Increased intracranial pressure can also be evaluated using state-of-art MRI techniques; the cerebrospinal fluid accumulation may play a role in traumatic brain injury, stroke and intracranial hemorrhages. It also has an impact in normal pressure hydrocephalus, the symptoms of which may overlap with those of Alzheimer's disease.

Evidence that these problems have become ubiquitous can be found in the reported statistics that there are as many as one million whiplash injuries every year. Reported Chiari I abnormalities have increased as sagittal MRI midline slices from routine brain scans now allow for the quantitation of cerebellar tonsillar ectopia. MRI has impacted the threshold for diagnosis. It is not clear how trauma plays a role in the activation of symptoms attributed to Chiari I type malformation – are symptoms coincidental to trauma, awakened by the trauma or possibly caused by the trauma? This is another avenue of exciting research.

We welcome you to this fruitful frontier and hope that collecting the insight of this diverse set of researchers will benefit both your practice and patients in the years to come.

Francis W. Smith, London
Jay S. Dworkin, Melville, N.Y.

