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HOSSAM MAGHRABY

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# التوثيق الالكتروني والميكروفيلم

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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

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# Role of MRI Diffusion Tensor Imaging in early diagnosis of Cervical Spondylotic Myelopathy (CSM)

Thesis

*Submitted for Partial Fulfillment of Master Degree in **Radiodiagnosis***

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***Ahmed Mahmoud Mohammed Ismail***

# ABSTRACT

Cervical compressive myelopathy represents a clinico-radiological challenge due to the mismatch between the patients' presentations and the conventional MR findings caused by its lack of detection of detailed cervical cord microstructural changes.

Although conventional MRI is the gold standard for radiographic evaluation, it has a limited application for determining prognosis and recovery.

In the last decade, Diffusion tensor imaging (DTI) parameters which are based on the preferential diffusion of water molecules, provide a promising imaging technique in the detection and evaluation of early spondylotic myelopathy changes before its establishment in conventional T2 images of MRI. In our study we correlated the FA values of the cervical cord opposite normal disc, affected disc and below affected disc levels.



**Key words**: MR diffusion tensor imaging; Fractional anisotropy; European myelopathy score; Cervical spondylotic myelopathy

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# List of Abbreviations

| Abb. | Full term |
|---|---|

***ADC*** ..... *Apparent diffusion coefficient*

***AI*** ..... *Anisotropy index*

***ALS*** ..... *Amyelotropic lateral sclerosis*

***BSCB*** ..... *Blood spinal cord barrier*

***CNS*** ..... *Central nervous system*

***CSF*** ..... *Cerebrospinal fluid*

***CSM*** ..... *Cervical spondylotic myelopathy*

***CSS*** ..... *Congenital canal stenosis*

***CTM*** ..... *Computed tomography myelography*

***DTI*** ..... *Diffusion tensor imaging*

***DWI*** ..... *Diffusion weighted imaging*

***EMG*** ..... *Electromyography*

***EMS*** ..... *European myelopathy score*

***FA*** ..... *Fractional anisotropy*

***GM*** ..... *Gray matter*

***IAR*** ..... *Instantaneous axis of rotation*

***JOA*** ..... *Japanese orthopedic association*

***lADC*** ..... *Longitudinal apparent diffusion coefficient*

***MD*** ..... *Mean diffusivity*

***MEP*** ..... *Motor evoked potential*

***mJOA*** ..... *Modified Chile's Japanese orthopedic association*

***MRA*** ..... *Magnetic resonance angiography*

# List of Abbreviations (Cont...)

| Abb. | Full term |
|---|---|
| ***MRI*** | *Magnetic resonance imaging* |
| ***NCS*** | *Nerve conduction study* |
| ***OLF*** | *Ossification of ligamentum flavum* |
| ***OPLL*** | *Ossification of the posterior longitudinal ligament* |
| ***RD*** | *Radial diffusivity* |
| ***ROI*** | *Region of interest* |
| ***SC*** | *Spinal cord* |
| ***SCI*** | *Spinal cord injury* |
| ***SEP*** | *Somatosensory evoked potential* |
| ***tADC*** | *Transverse apparent diffusion coefficient* |
| ***TMS*** | *Transcranial magnetic stimulation* |
| ***WM*** | *White matter* |

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