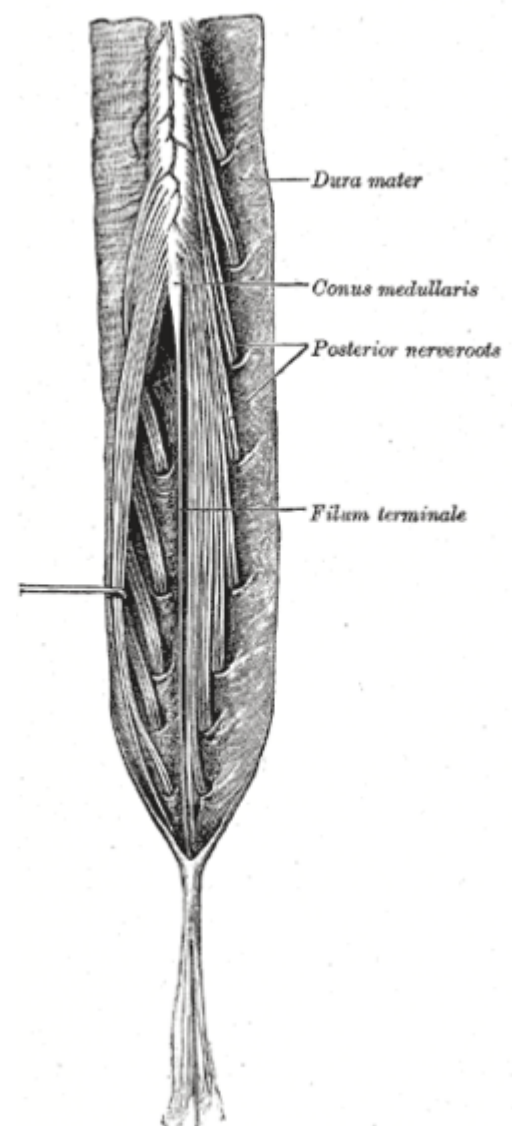


Conus medullaris

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The conus medullaris (Latin for “medullary cone”) is the tapered, lower end of the [spinal cord](#). It occurs near lumbar vertebral levels 1 (L1) and 2 (L2). The upper end of the conus medullaris is usually not well defined. After the spinal cord tapers out, the spinal nerves continue to branch out diagonally, forming the [cauda equina](#).



see [Conus medullaris lipoma](#)

see [Conus medullaris ganglioneuroma](#)

Termination

Hiware et al. evaluated the [morphometry](#) and termination of conus medullaris (CM) in the eastern province of [Saudi Arabia](#). The [lumbar spine magnetic resonance imaging](#) (MRI) scans of 179 citizens of Saudi Arabia were selected and divided into males and females. Parameters such as the level of termination of CM, the length/width of CM, and its termination were reported. The maximum number of males and females were observed in the less than 20 years age group as 23 (25.5%) and 22 (24.7%), respectively. The termination level of CM was at the (first lumbar vertebra) [L1](#) vertebra in 51.4% of the Saudi population. The level of termination of CM is below the (second lumbar vertebra) L2 level in one patient at L3, L3-L4, L5, and L5-S1 levels. On comparing the length of CM, no statistically significant difference was observed between the different levels of the vertebra. However, there was a statistically significant difference between the width and the CM termination ($p=0.02$). The various age groups and CM termination had no statistically significant correlation ($p=0.47$). The most common level of termination of conus medullaris was at the L1 vertebra. The level of CM termination is strongly associated with the width of CM ¹⁾.

Magnetic resonance imaging (MRI)-derived spinal cord (SC) gray and white matter (GM/WM) volume are useful indirect measures of atrophy and neurodegeneration over time, typically obtained in the upper SC. Neuropathological evidence suggests that in certain neurological conditions, early degeneration may occur as low as the sacral SC. In this study, the feasibility of GM/WM segmentation of the conus medullaris (CM) was assessed in vivo. METHODS:

Twenty-three healthy volunteers (11 female, mean age 47 years) underwent high-resolution 3T MRI of the CM using a 3-dimensional fast field echo sequence. Reproducibility of the volume measurements was assessed in 5 subjects (2 female, 25-37 years) by one rater who repeated the analysis 3 times and also with 2 additional raters working independently in order to calculate the intra- and interrater coefficient of variation (COV), respectively. Furthermore, the influence of age, gender, spine and SC metrics on tissue-specific measures of the CM was investigated. RESULTS:

Volumetric CM analyses (N = 23) for the SC, GM, and WM revealed a mean (SD) total volume of CM-TV = 1746.9 (296.7) mm³, CM-GM-TV = 731.2 (106.0) mm³, and CM-WM-TV = 1014.6 (211.3) mm³, respectively. The intra-rater COV for measuring the CM-TV and CM-GM-TV was 3.38% and 7.42%, respectively; the interrater COV was 3.43% and 10.80%, respectively. Using age, gender, spine and SC metrics in regression models substantially reduced group variability for CM-TV, CM-WM-TV, and CM-GM-TV by up to 39.2%, 42.7%, and 21.2%, respectively. CONCLUSIONS:

The results from this study demonstrate the feasibility of obtaining tissue-specific volume measurements in the CM by means of MRI with good reproducibility and provide normative data for future applications in neurological diseases affecting the lower SC ²⁾.

1)

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36505957; PMCID: PMC9730429.

²⁾

Yiannakas MC, Liechti MD, Budtarad N, Cullinane P, Yang X, Toosy AT, Panicker JN, Gandini Wheeler-Kingshott CAM. Gray vs. White Matter Segmentation of the Conus Medullaris: Reliability and Variability in Healthy Volunteers. J Neuroimaging. 2018 Dec 24. doi: 10.1111/jon.12591. [Epub ahead of print] PubMed PMID: 30582252.

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