Morphometric Analysis of the Corpus, Spinal Canal and Torg Ratio Using Midsagittal Cervical Vertebrae Computed Tomography Scan: Indonesian Population

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Abstract

Objective: To determine the normal ranges of cervical spinal canal morphometry in Indonesian population and to compare the acquired data collected from other populations

Methods: Computed tomography measurements on the diameter of midsagital spinal canal and corpus of cervical vertebrae and its Torg ratio from the lower cervical (C3–C7) canal from 24 normal Indonesian adults were performed at the Radiology Department of Dr. Hasan Sadikin General Hospital. Patients who had cervical spine disorders and those under 20 years old were exluded. We used computed tomography scan midsagittal view to measure the aforementioned parameters.

Results: The average diameter for the cervical spinal canals for the Indonesian population is comparable with those of other Asian populations such as Hongkong and India, albeit with smaller Torg ratio.

Conclusions: This study reports the normal radiological anatomy of the midsagital spinal canal and corpus of cervical vertebrae as well as Torg ratio from the lower cervical vertebrae among Indonesian population. The measurements result of this study shows that, although slightly smaller, the measurement results for those parameters are identical with other Asian populations.

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Introduction

One of the predisposing factors for neck problems is cervical spinal canal stenosis, a condition in which the diameter of the cervical spinal canal is less than the normal measurement for the relevant age or sex of the individuals.[1–5] So far, there are several radiological and morphological anatomic studies on the size of spinal canal in different populations in the world.[1–6]

Plain lateral x-ray is usually used to determine the canal diameter. However, there are many limitations found in terms of value intepretation when using this method.[1,3,7,8] We used computed tomography (CT) scan imaging to measure the parameters being studied, i.e. midsagital spinal canal and corpus of cervical vertebrae diameters and the Torg ratio from lower cervical (C3–C7) canal. The method of analyis used was Torg and Pavlov canal-to-corpus ratio, in which the magnification factor could be omitted.[2,3,9] Cervical CT scan was used because it gives better image of the bone; thus, allows us to gain more accurate measurements compared to manual measurement.[9,10]

To our knowledge, until recently, there have been no report or study mentioning the cervical spinal canal morphometry for Indonesian population. Therefore, this study aimed to

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