

Letter to the Editor

In response to the article “Comparison of posterior cranial fossa morphometric measurements in Chiari type I patients with and without syrinx cavity on magnetic resonance imaging” Pol J Radiol 2022; 87: e694-e700

Ertuğrul H. Özay^{E,F}, Begumhan Baysal^{E,F}

Department of Radiology, Istanbul Medeniyet University, Istanbul, Turkey

Dear Editor,

We read with great interest and enthusiasm the article “Comparison of posterior cranial fossa morphometric measurements in Chiari type I patients with and without syrinx cavity on magnetic resonance imaging” [1]. The aim of that study was to compare the posterior fossa measurements in magnetic resonance imaging (MRI) of Chiari malformation type 1 (CHM1) patients with and without a syrinx within each group and with a (non-CHM) control group. In the study it was concluded that all the posterior cranial fossa lengths were shorter in patients with a syrinx, but the anterior posterior (AP) length of the posterior fossa was found to be the only measurement that was significantly different in the CHM1 patients with a syrinx. The posterior cranial fossa measurements were significantly lower in the patients with a syrinx measurement that exceeded more than half that of the spinal cord. Therefore, the maximum anteroposterior measurement of the syrinx (S)/anteroposterior measurement of the spinal cord at the same level (C) ratio can be a useful tool to determine the underlying aetiology. As mentioned, the key factor of this study is measurement of posterior fossa volumes. The researchers set specific landmarks to determine the boundaries of the posterior fossa.

In this article there was insufficient explanation of how the McRae line (ML) is formed and how it should be measured.

As Baysal *et al.* [2] mentioned, the lines of the cranio-cervical junction (CJ) are used primarily for the diagnosis of CJ pathologies, such as Chamberlain and McRae lines first determined in direct radiography. Chamberlain in 1939 [3] defined the line of the hard palate to opisthion, then in 1953 McRae [4] identified on direct radiography the line from the basion to the opisthion.

In mid-sagittal MRI or computed tomography images, the basion is the end tip of the clivus and the opisthion is the tip of the occipital bone, and they collectively form the margins of the foramen magnum.

The McRae line is traced between the basion and opisthion, the most anterior and posterior midsagittal points of the foramen magnum margin, respectively [1].

The given figures for the posterior fossa measurements, especially Figure 6, fail to emphasise the correct demonstration of ML, as it is clearly seen that the tip of the line which the author has drawn does not reach the opisthion.

Korbecki *et al.* [6] in Figure 9 of their article “Imaging of cerebrospinal fluid flow: fundamentals, techniques, and clinical applications of phase-contrast magnetic resonance imaging” clearly demonstrate the ML successfully.

Inaccurate measurement of ML not only puts the credibility of the findings of this study in jeopardy but also can mislead inexperienced radiologists about correctly evaluating craniocervical junction pathologies in daily practice.

Correspondence address:

Ertuğrul H. Özay, MD, Department of Radiology, Istanbul Medeniyet University, Istanbul, Turkey, e-mail: hertugrul95@gmail.com

Authors' contribution:

A Study design · B Data collection · C Statistical analysis · D Data interpretation · E Manuscript preparation · F Literature search · G Funds collection

Disclosures

1. Institutional review board statement: Not applicable.
 2. Assistance with the article: None.
 3. Financial support and sponsorship: None.
 4. Conflicts of interest: None.
-

References

1. Dogan GM, Sigirci A, Tetik B, Pasahan R, Onal C, Arslan AK. Comparison of posterior cranial fossa morphometric measurements in Chiari type I patients with and without syrinx cavity on magnetic resonance imaging. Pol J Radiol 2022; 87: e694-e700. DOI: 10.5114/pjr.2022.123895.
2. Baysal B, Eser MB, Sorkun M. Radiological approach to basilar invagination type B: reliability and accuracy. J Neuroradiol 2022; 49: 33-40.
3. Chamberlain WE. Basilar impression (platybasia): a bizarre developmental anomaly of the occipital bone and upper cervical spine with striking and misleading neurologic manifestations. Yale J Biol Med 1939; 11: 487-496.
4. McRae DL, Barnum AS. Occipitalization of the atlas. Am J Roentgenol Radium Ther Nucl Med 1953; 70: 23-46.
5. Barros DPM, Ribeiro ECO, Nascimento JJC, Silva-Neto EJ, Araújo-Neto SA. Reliability and agreement in the cerebellar tonsil tip localization: two methods using the mcrae line concept in MRI. World Neurosurg 2022; 165: e611-e618. DOI: 10.1016/j.wneu.2022.06.108.
6. Korbecki A, Zimny A, Podgórski P, Szaśiadek M, Bładowska J. Imaging of cerebrospinal fluid flow: fundamentals, techniques, and clinical applications of phase-contrast magnetic resonance imaging. Pol J Radiol 2019; 84: e240-e250. DOI: 10.5114/pjr.2019.86881.