

● *Letter to the Editor*

RELATING TO CLASSIFICATION AND ETIOLOGY OF CHIARI I MALFORMATION

Editor:

In the Talal Amer and Omran M. El-Shmam review published in your journal,¹ there are two types of classification for Chiari I malformation: type A, which is associated with syringomyelia and type B, which is not associated with syringomyelia.

Hans Chiari (1851–1916) first reported Chiari malformation (1891) morphologically as a cerebellar tonsillar herniation with occasional fourth ventricle elongation. Later in 1896, he reported Chiari II malformation as a downward displacement of the cerebellar vermix, fourth ventricle, and brainstem, all of which were associated with myelomeningocele.² The first suggestion that traction at the level of the neuroaxis may represent the mechanism for the Chiari II malformation appears here. It was not felt that this mechanism was responsible for the Chiari I malformation due to lack of detection of caudal malformations.

Further evidence supports that there is a traction mechanism involved in the genesis of Chiari I malformation.^{3,4} This, together with data reporting new caudal disorders such as anchored spinal cord syndrome⁵ and tight filum terminale syndrome,^{6–8} suggests that Chiari I malformation may be caused by injuries generated by axial forces in the neuroaxis,^{9,10} which were unknown in age of Chiari. Therefore, the difference between Chiari I and Chiari II malformation is one of gradation or severity, since they have the same etiology.

According to the authors¹ and existing data, I believe the morphological classification of Chiari I malformation could be also applied to Chiari II malformation. This allows for a greater morphological definition of the pathology. Furthermore, the severity can be described by the presence of lithic or syringomyelic injury of spinal cord.

Encouraging results have been obtained with mechanical liberation of the neuroaxis by performing a filum terminale resection.¹¹ Particularly, in the case report 4,¹¹ consisting of a Type B Chiari I malformation,¹ syringomyelic syndrome lasting 50 years disappeared by performing a filum terminale resection.

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REFERENCES

1. Amer, T.A.; El-Shmam, O.M. Chiari malformation type I: A new MRI classification. *Mag. Reson. Imaging.* 15:397–403; 1997.
2. Cai, C.; Oakes, W.J.; Hindbain herniation syndromes: The Chiari malformations (I and II). *Sem. Pediat. Neurol.* 4:179–191; 1997.
3. Roth, M. Craniocervical growth collision: Another explanation of the Arnold Chiari malformation and of bassilar impression. *Neuroradiology* 28:187–94; 1986.
4. Royo-Salvador, M.B. Siringomielia, escoliosis y malformación de Arnold Chiari idiopáticas: etiología común. *Rev. Neurol.* 24:937–959; 1996.
5. Yamada, S.; Zinke, D.E.; Sanders, D. Pathophysiology of tethered cord syndrome. *J. Neurosurg.* 54:494–503; 1982.
6. Garceau, G.J. The filum terminale syndrome (The cord traction syndrome). *J. Bone Joint Surg.* 35:711–716; 1953.
7. Hymelris, P.; Grafton, J. Tight filum terminale. *Arch. Surg.* 73:556–566; 1956.
8. Jones, P.H.; Love, J.G. Tight filum terminale. *Arch. Surg.* 73:556–566; 1956.
9. Royo-Salvador, M.B. Impresión basilar, platibasia, retroceso odontoideo, kinking del tronco cerebral, etiología común con la siringomielia, escoliosis y malformación de Arnold-Chiari idiopáticas. *Rev. Neurol.* 24:1241–1250; 1996.
10. Royo-Salvador, M.B. Aportación a la etiología de la siringomielia. Tesis doctoral. Universidad Autónoma de Barcelona. 1992.
11. Royo-Salvador, M.B. Nuevo tratamiento quirúrgico para la siringomielia, la escoliosis, la malformación de Arnold-Chiari, el kinking del tronco cerebral, el retroceso odontoideo, la impresión basilar y la platibasia idiopáticas. *Rev. Neurol.* 25:523–530; 1997.