Durotomy and foramen magnum decompression

TO THE EDITOR: We read with interest the article by Kennedy et al.8 (Kennedy BC, Kelly KM, Phan MQ, et al: Outcomes after suboccipital decompression without dural opening in children with Chiari malformation Type I. J Neurosurg Pediatr 16:150–158, August 2015). The authors discuss a relatively large series of patients with Chiari malformation Type I (CM-I) who were treated by foramen magnum decompression without resorting to opening of the dura mater. The authors report a positive outcome of symptoms following such a strategy of treatment. They discuss the potential negative issues related to opening the dura and intradural manipulations.

In 1998 we presented a series of 190 patients with basilar invagination.6 Of these, 102 patients had CM-I. Twenty-three patients with CM-I were below the age of 21 years. This article was among the first few that related small posterior cranial fossa volume to CM-I. According to my information, this article was among the first in the literature that discussed treatment of CM-I by foramen magnum decompression without opening of the dura. In the series, the dura was not opened even when CM-I was associated with syringomyelia. We also discussed in our subsequent articles that the issue of CM-I and small posterior cranial fossa volume was relevant only in cases with basilar invagination.1,5,7,9 Considering the direct relevance to the issue under discussion, the authors should have referenced our work.

In our more recent article, we identified the relationship of CM-I with atlantoaxial instability.3 We hypothesized that a herniated cerebellar tonsil is like “Nature’s air bag” and functions to cushion the craniocervical cord against manifest or potential atlantoaxial instability.4 Our analysis identified that the posterior fossa volume is not small in these cases. Moreover, the superior vermis and superior part of the cerebellum are atrophic in these cases, and the concept that the CM-I is a result of the presence of a smaller volume of posterior cranial fossa does not seem to be relevant in these cases. It would have been interesting if the authors had evaluated the posterior fossa volume and the status of the cerebellum in the cases discussed. After our experience with several patients with CM-I over more than 30 years, we conclude that foramen magnum decompression is necessary only rarely.2

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DISCLOSURE
The author reports no conflict of interest.

References

Response

We thank Dr. Goel for his interest and comments regarding our recent article. We are very familiar with Dr. Goel’s publications, but did not reference them because
they primarily include adult patients and are neither the first nor the largest reports of children undergoing suboccipital decompression without dural opening for CM-I. Furthermore, perhaps in part due to his geographic location, we believe that Dr. Goel has a unique practice, and it is unlikely that the outcomes of his patients would reflect the majority of other patients with CM-I around the world. This notion is supported by the very high percentage of patients in his series presenting with basilar invagination, occipitalization of the atlas, and advanced neurological deficits.

Dr. Goel discusses several times in his letter his work investigating the relationship between CM-I and posterior fossa volume, and mentions that it would have been interesting for us to have evaluated the posterior fossa volume in our cases. We chose instead to focus primarily on clinical rather than radiographic outcomes, because the relationship between posterior fossa volume and CM-I has already been extensively investigated and reviewed.

Dr. Goel also mentions his recent article in which he states that the “pathogenesis of CM . . . is primarily related to atlantoaxial instability,” that “surgical treatment in these cases should be directed toward atlantoaxial stabilization and segmental arthrodesis,” and that “foramen magnum decompression is not necessary and may be counter-effective in the long run.” Contrary to Dr. Goel’s conclusions, we believe that: 1) there is overwhelming medical evidence supporting suboccipital decompression for children with CM-I, regardless of whether the dura is opened, 2) decompression is accepted by the vast majority of pediatric neurosurgeons across the world, and 3) the incidence of immediate or delayed symptomatic atlantoaxial instability in the general pediatric population with CM-I is extremely rare. Our thoughts are echoed by the experience of many members of the Pediatric Craniocervical Society, which led the Society to write a statement in response to Dr. Goel’s paper that has been published in the Journal of Neurosurgery: Spine.

Last, Dr. Goel hypothesizes that in patients with CM-I, the cerebellar tonsils act as “Nature’s air bag” to “cushion the craniocervical cord.” We did not design our study to support or refute Dr. Goel’s hypothesis. Rather, the primary aim of our study was to report the clinical outcomes after suboccipital decompression without dural opening in children with CM-I, in what is, to our knowledge, the largest reported series in the literature.

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References