

Questionable Supremacy of C1-C2 Fusion for Chiari Without Apparent Instability: Comments on “Surgical Outcomes of C1-2 Posterior Stabilization in Patients With Chiari Malformation Type I” by Arslan et al

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To the Editor:

We read with great interest the article by Arslan et al in which they present their results after stabilization for Chiari malformation (CM) without apparent instability.¹ Influenced by the concept of Dr Goel and his advocacy for C1-C2 fusion, the authors have performed stabilization without foramen magnum decompression (FMD) and replicated an excellent outcome. After a detailed study of the article, it appears that the literature cited seems to be biased, missing out on our work, which is perhaps the only major literature that questions the claimed effectiveness of this procedure in CM with no apparent instability.² Despite being a frequently encountered neurosurgical condition, CM continues to be an enigma with treatment techniques still evolving. In contrast to the typical and traditional FMD, the fusion technique that the authors propose comes at the cost of significant restriction of neck mobility. In light of this, advocating fusion for all patients with CM has kindled controversy. In our series of 40 such patients, we realized that this procedure provides symptomatic relief in only about 70%, which is almost equivalent to that achieved after FMD.² Moreover, we could not clearly identify any patient subset such as assimilated C1, platybasia, or true basilar-invasion, which many surgeons believe could potentially benefit from this procedure. Hence, the superiority of this treatment, at least at present, remains unproven. Additionally, the authors' classification of C1-C2 instability based on single parasagittal section can never be the marker of true instability. Even in normal individuals, with the rotation of neck, the C1-facet moves anterior to that of C2 on one side with the relation becoming inverse on the contralateral side.

The C1-C2 fusion, indeed a radical surgery from patient's perspective, stems from the hypothesis that CM results from an underlying atlantoaxial dislocation (AAD). However, there is hardly any scientific evidence that supports such phenomenon.

We have various reasons why we refute such pathophysiology. More than two thirds of patients do not have associated CM. Had CM been the compensatory air-bag phenomenon, why does it not coexist in all cases? Second, AAD has never been detected at birth or in utero, whereas CM has been. This observation again contradicts the theory that CM is a secondary phenomenon to preexisting AAD. At this point, we would like to reiterate why we performed C1-C2 fusion in our patients. The concept that we believe in stands distinct from that of Goel.^{2,3} For CM, the philosophy of treatment is restoration of the reduced posterior fossa (PF) volume, which is considered to be the principal event underlying the CM. The conventional FMD also works on this principle. We believe and have proved in our previous publication that C1-C2 distraction and fixation in patients with CM indirectly brings about PF enlargement.^{2,3} The distraction of the dens by jamming the joint spacers opens up the ventral CSF space, produces ventral brainstem decompression, and thus provides an overall improvement in PF volume. Given the limited, current evidence, we would be cautious in suggesting blanket C1-C2 fusion for every patient with CM.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

1. Arslan A, Olguner SK, Acik V, et al. Surgical outcomes of C1-2 posterior stabilization in patients with Chiari malformation type 1. *Global Spine J.* Published online August 13, 2020. doi:10.1177/2192568220945293
2. Salunke P, Karthigeyan M, Malik P, Panchal C. Changing perception but unaltered reality: how effective is C1-C2 fixation for Chiari malformations without instability? *World Neurosurg.* 2020;136:e234-e244.
3. Salunke P, Karthigeyan M, Malik P. Foramen magnum decompression without bone removal: C1-C2 posterior fixation for Chiari with congenital atlantoaxial dislocation/basilar invagination. *Surg Neurol Int.* 2019;10:38.