

Large Study Compares Surgical Techniques

A very large study from China compared the surgical outcomes of two different procedures in more than 1000 Chiari patients with syringomyelia. The study assessed outcomes in three ways: first, a reduction in syrinx length or width by at least 50%; second, clinical improvement in patient reported symptoms; and third the rate of revision surgeries needed.

The first surgical procedure was a standard posterior fossa decompression with duraplasty. In this operation, bone is removed at the base of the skull, part of the C1 vertebra is removed, the dura is opened, and a patch is sewn in to create more space for cerebrospinal fluid flow. In this group, the spinal fluid space was not exposed and the herniated cerebellar tonsils were not manipulated in any way. The second procedure involved removing less bone from the skull, *not* removing any part of C1, but directly inspecting the spinal fluid pathways, and partially reducing the cerebellar tonsils to restore spinal fluid flow.

The surgeons found that the procedure that removed part of the cerebellar tonsils was more effective in reducing the size of the syrinxes. Specifically, 78% of the patients in that group saw a reduction of at least 50% compared to 60% in the duraplasty group. Interestingly however, this difference did not translate to a significant difference in clinical improvement where both groups saw about a 90% improvement rate. On the other hand, patients who underwent the duraplasty procedure were more likely to require additional surgery compared to the tonsillar reduction group (16% vs 4%). The complication rate for each group was not significantly different at approximately 11%.

It is important to note that the patients were not randomly assigned to the different procedures, but the researchers did use a statistical technique which matched participants by age, gender, herniation size, and other parameters that might have an influence on the outcome. It should also be noted that the definition of clinical improvement used was very broad and more precise clinical assessments in the future may show differences between the techniques. Finally, it is important to recognize that the results from international outcome studies may not be directly applicable to the US.

In the early 2000s a pediatric neurosurgeon in the US proposed that removing part of the cerebellar tonsils may be a superior technique for treating Chiari. At the time, this generated a lot of controversy and pushback in the neurosurgical community from people who felt that preserving brain tissue was paramount. Since that time, manipulating the cerebellar tonsils has become widely accepted as an available surgical option.

Source: Yuan C, Yuan F, Li K, et al. Comparison of Foramen Magnum and Foramen of Magendie Dredging Versus Posterior Fossa Decompression With Duraplasty in Adults With Chiari I Malformation-Syringomyelia: A Propensity-Matched Study. *Neurosurgery*. Published online May 4, 2026. doi:10.1227/neu.0000000000004061

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