

Study Finds No Association Between Tethered Cord and Chiari in Children

Tethered Cord Syndrome (TCS) refers to when the lower part of the spinal cord is abnormally anchored, or tethered, which can cause back pain, leg pain and weakness, and bladder and bowel dysfunction among other problems. The tethering can be due to issues that include, but are not limited to, a fatty filum terminale – which is a threadlike tissue that anchors the bottom of the cord, fatty deposits in the dura, and scar tissue. There is controversy over how to diagnose TCS with the conservative approach requiring imaging evidence that the conus medullaris is located below a certain spinal vertebra, thus indicating it is being pulled down. However, there is disagreement over what this reference level should be and some clinicians will even diagnose and operate on TCS based solely on symptoms as opposed to imaging. Surgery involves freeing the cord from whatever is abnormally anchoring it.

For years, there has been speculation that there might be an association between TCS and Chiari, with some people going so far as to claim that Chiari is caused by TCS. However, research on cadavers has shown that the tension from tethering dissipates well before it reaches the upper spinal cord. Now, a group from the University of Michigan has used their extensive hospital database to show that TCS is not more common among Chiari children than the general pediatric population.

Specifically, they identified over 900 patients under 21 years of age with MRIs showing 5mm or more of cerebellar tonsil herniation (Chiari). From these 647 also had lumbar MRIs in their records which could be reviewed for TCS. Of the 647, 43% were symptomatic and 30% had syrinxes. For the study, the researchers created 3 groups: symptomatic Chiari patients, asymptomatic Chiari patients, and age and gender matched controls which were randomly selected from children who had spinal imaging for other reasons.

When they compared rates of TCS causes, low lying conus, and TCS surgery, there were no significant differences between any of the groups. For example, 4.2% of the Chiari group (both symptomatic and asymptomatic) had a fatty filum compared to 4.7% of the control group. In addition, 1.4% of the Chiari group had undergone TCS surgery compared to 1.7% of the control group.

One of the core tenets of the scientific method is that you don't assume an association between two things, it must be proven. So for now, while there are clearly some patients who have both, there is no strong evidence that the rate of TCS is higher among Chiari children or that the two conditions are linked.

Source: Holste KG, McVeigh L, Albdewi MJ, et al. No increased incidence of tethered cord syndrome or low-lying conus in pediatric Chiari malformation type I. *J Neurosurg Pediatr*. Published online October 3, 2025.
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