



## Sources: Static Measures of Chiari

Chiari I malformation redefined: clinical and radiographic findings for 364 symptomatic patients.  
Milhorat TH, Chou MW, Trinidad EM, Kula RW, Mandell M, Wolpert C, Speer MC.  
Neurosurgery. 1999 May;44(5):1005-17. doi: 10.1097/00006123-199905000-00042.  
PMID: 10232534

Chiari malformation Type I and syrinx in children undergoing magnetic resonance imaging.  
Strahle J, Muraszko KM, Kapur J, Bapuraj JR, Garton HJ, Maher CO.  
J Neurosurg Pediatr. 2011 Aug;8(2):205-13. doi: 10.3171/2011.5.PEDS1121.  
PMID: 21806364

A morphometric assessment of type I Chiari malformation above the McRae line: A retrospective case-control study in 302 adult female subjects. Houston JR, Eppelheimer MS, Pahlavian SH, Biswas D, Urbizu A, Martin BA, Bapuraj JR, Luciano M, Allen PA, Loth F. J Neuroradiol. 2018 Feb;45(1):23-31. doi: 10.1016/j.neurad.2017.06.006. Epub 2017 Aug 18. PMID: 28826656

Evidence for sex differences in morphological abnormalities in type I Chiari malformation.  
Houston JR, Allen NJ, Eppelheimer MS, Bapuraj JR, Biswas D, Allen PA, Vorster SJ, Luciano MG, Loth F. Neuroradiol J. 2019 Dec;32(6):458-466. doi: 10.1177/1971400919857212. Epub 2019 Jun 18.  
PMID: 31210559

Three-Dimensional CT Morphometric Image Analysis of the Clivus and Sphenoid Sinus in Chiari Malformation Type I. Nwotchouang BST, Eppelheimer MS, Bishop P, Biswas D, Andronowski JM, Bapuraj JR, Frim D, Labuda R, Amini R, Loth F. Ann Biomed Eng. 2019 Nov;47(11):2284-2295. doi: 10.1007/s10439-019-02301-5. Epub 2019 Jun 11. PMID: 31187348

A Retrospective 2D Morphometric Analysis of Adult Female Chiari Type I Patients with Commonly Reported and Related Conditions. Eppelheimer MS, Houston JR, Bapuraj JR, Labuda R, Loth DM, Braun AM, Allen NJ, Heidari Pahlavian S, Biswas D, Urbizu A, Martin BA, Maher CO, Allen PA, Loth F. Front Neuroanat. 2018 Jan 19;12:2. doi: 10.3389/fnana.2018.00002. eCollection 2018. PMID: 29403363

Clivus length distinguishes between asymptomatic healthy controls and symptomatic adult women with Chiari malformation type I. Nwotchouang BST, Eppelheimer MS, Ibrahimy A, Houston JR, Biswas D, Labuda R, Bapuraj JR, Allen PA, Frim D, Loth F. Neuroradiology. 2020 Nov;62(11):1389-1400. doi: 10.1007/s00234-020-02453-5. Epub 2020 May 16. PMID: 32418026

Quantification of Cerebellar Crowding in Type I Chiari Malformation. Biswas D, Eppelheimer MS, Houston JR, Ibrahimy A, Bapuraj JR, Labuda R, Allen PA, Frim D, Loth F. Ann Biomed Eng. 2019 Mar;47(3):731-743. doi: 10.1007/s10439-018-02175-z. Epub 2018 Dec 7. PMID: 30535814

Correlation of anterior CSF space in the cervical spine with Chicago Chiari Outcome Scale score in adult females. Allen PA, Loth F, Loth D, Al Samman MM, Labuda R, Herrera C, Bapuraj JR, Klinge PM. J Neurosurg Spine. 2024 Dec 6;42(3):299-308. doi: 10.3171/2024.7.SPINE24370. Print 2025 Mar 1.  
PMID: 39642381

Incidence and Management of Basilar Invagination with Associated Chiari I Malformation: WFNS Spine Committee Recommendations. Klekamp J, Alves OL, Zileli M, Oertel J, Yaman O, Sharif S, Visocchi M, Goel A, Botelho R. *Spine (Phila Pa 1976)*. 2025 Feb 10. doi: 10.1097/BRS.0000000000005293. Online ahead of print. PMID: 39927420

Chiari I malformation with and without basilar invagination: a comparative study. Klekamp J. *Neurosurg Focus*. 2015 Apr;38(4):E12. doi: 10.3171/2015.1.FOCUS14783. PMID: 25828488

Does the mesodermal derangement in Chiari Type I malformation extend to the cervical spine? Evidence from an analytical morphometric study on cervical paraspinal muscles. Thakar S, Kurudi Siddappa A, Aryan S, Mohan D, Sai Kiran NA, Hegde AS. *J Neurosurg Spine*. 2017 Oct;27(4):421-427. doi: 10.3171/2016.12.SPINE16914. Epub 2017 May 12. PMID: 28498073

Can the Etiopathogenesis of Chiari Malformation Be Craniocervical Junction Stabilization Difference? Morphometric Analysis of Craniocervical Junction Ligaments. Karaaslan B, Börcek AÖ, Uçar M, Aykol Ş. *World Neurosurg*. 2019 Aug;128:e1096-e1101. doi: 10.1016/j.wneu.2019.05.072. Epub 2019 May 17. PMID: 31103770

Morphological and ultrastructural investigation of the posterior atlanto-occipital membrane: Comparing children with Chiari malformation type I and controls. Ravindra VM, Robinson L, Jensen H, Kurudza E, Joyce E, Ludwick A, Telford R, Youssef O, Ryan J, Bollo RJ, Iyer RR, Kestle JRW, Cheshier SH, Ikeda DS, Mao Q, Brockmeyer DL. *PLoS One*. 2024 Jan 16;19(1):e0296260. doi: 10.1371/journal.pone.0296260. eCollection 2024. PMID: 38227601

A morphometric study of the atlanto-occipital joint in adult patients with Chiari malformation type I. Wan M, Zong R, Tong HY, Zhang ZZ, Zhao B, Yu XG. *Br J Neurosurg*. 2024 Feb;38(1):12-15. doi: 10.1080/02688697.2020.1823940. Epub 2020 Sep 24. PMID: 32969751

Imaging and health metrics in incidental cerebellar tonsillar ectopia: findings from the Adolescent Brain Cognitive Development Study (ABCD). Nwotchouang BST, Ibrahimy A, Loth DM, Labuda E, Labuda N, Eppleheimer M, Labuda R, Bapuraj JR, Allen PA, Klinge P, Loth F. *Neuroradiology*. 2021 Nov;63(11):1913-1924. doi: 10.1007/s00234-021-02759-y. Epub 2021 Jul 11. PMID: 34247260