

Duraplasty for Chiari Malformation

- [Cognitive-Affective Improvement on Cerebellar Neuropsychiatric Rating Scale Scores in Adults and Children After Decompression of Chiari Malformation Type I](#)
- [Posterior Fossa Decompression Followed by Duraplasty with Arachnoid-Preserving Technique for Primary and Recurrent Adult Chiari Malformation Type-1.5: A Comparative Retrospective Study](#)
- [Chiari malformation type I with an associated syrinx presenting as acute central cord syndrome in a child: illustrative case](#)
- [Can posterior fossa decompression alone effectively treat Chiari malformation type I patients with even severe syringes? Illustrative cases](#)
- [SEMANTICS AND DYNAMICS OF HEADACHE IN PATIENTS WITH CHIARI MALFORMATION TYPE I AFTER DECOMPRESSION SURGERY: EXPERIENCE FROM AZERBAIJAN](#)
- [A new concept and surgical approach for Chiari malformation type I based on the protection and strengthening of the myodural Bridge](#)
- [Pilot study to assess the safety and efficacy of human acellular dermal matrix for Chiari surgery](#)
- [Impact of intradural abnormalities on symptoms and clinical outcomes in Chiari malformation](#)

A variety of surgical techniques for CM-I have been used, and there is a controversy about whether to use posterior fossa decompression with [duraplasty](#) (PFDD) or posterior fossa decompression without duraplasty (PFD) in CM-I patients.

In 107 patients with [Chiari type 1 deformity](#) from the [Severance Hospital](#), Surgical techniques were divided into four groups based on [duraplasty](#) or [C1 Laminectomy](#) usage. Among the study subjects, 38 patients underwent duraplasty and had their [syrinx](#) volumes measured separately on serial [magnetic resonance imaging](#). A three-dimensional visualization software was used to evaluate the syrinx-volume decrease rate.

Bony [decompression](#) exhibited a mere 20% volume expansion of the lower half [posterior fossa](#). C1L offered a 3% additional volume expansion, which rose to 5% when duraplasty was added ($p=0.029$). There were no significant differences in complication rate when C1L was combined with duraplasty ($p=0.526$). Syrinx volumes were analyzed in 38 patients who had undergone duraplasty. Among them, 28 patients who had undergone duraplasty without C1L demonstrated a 5.9% monthly decrease in syrinx volume, which was 7.5% in the remaining 10 patients with C1L ($p=0.040$).

C1L was effective in increasing posterior fossa volume expansion, both with and without duraplasty. A more rapid decrease in syrinx volume occurred when C1L was combined with duraplasty ¹⁾.

Chen et al., compared the clinical results and effectiveness of PFDD and PFD in adult patients with CM-I. The cases of 103 adult CM-I patients who underwent posterior fossa decompression with or without duraplasty from 2008 to 2014 were reviewed retrospectively. Patients were divided into 2 groups according to the surgical techniques: PFDD group ($n=70$) and PFD group ($n=33$). We compared the demographics, preoperative symptoms, radiographic characteristics, postoperative complications, and clinical outcomes between the PFD and PFDD patients. No statistically significant

differences were found between the PFDD and PFD groups with regard to demographics, preoperative symptoms, radiographic characteristics, and clinical outcomes ($P > 0.05$); however, the postoperative complication aseptic meningitis occurred more frequently in the PFDD group than in the PFD group ($P = 0.027$). We also performed a literature review about the PFDD and PFD and made a summary of these previous studies. Our study suggests that both PFDD and PFD could achieve similar clinical outcomes for adult CM-I patients. The choice of surgical procedure should be based on the patient's condition. PFDD may lead to a higher complication rate and autologous grafts seemed to perform better than nonautologous grafts for duraplasty ²⁾.

Intraoperative Ultrasound with measurement of CSF allows the proper selection of patients with [Chiari type 1 deformity](#) that can have a less invasive surgery with bone decompression without [duraplasty](#) ³⁾.

The general trend reveals an increase in the diagnosis of CM-I at younger ages with a significant proportion of these being [incidental](#) findings (0.5-3.6%) in asymptomatic patients as well as a rise in the number of patients undergoing Chiari posterior fossa decompression surgery (PFD). The type of surgical intervention varies widely. At their institution, 104 (37%) Chiari surgeries were bone-only PFD with/without outer leaf durotomy, whereas 177 (63%) were PFD with [duraplasty](#). They did not find a significant difference in outcomes between the PFD and PFDD groups ($p = 0.59$). An analysis of failures revealed a significant difference between patients who underwent tonsillar coagulation versus those whose tonsils were not manipulated ($p = 0.02$).

While the optimal surgical intervention continues to remain elusive, there is a shift away from intradural techniques in favor of a simple, extradural approach (including dural delamination) in pediatric patients due to high rates of clinical and radiographic success, along with a lower complication rate. The efficacy, safety, and necessity of tonsillar manipulation continue to be heavily contested, as evidence increasingly supports the efficacy and safety of less tonsillar manipulation, including their own experience ⁴⁾.

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³⁾

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⁴⁾

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