

Key Points

- 31 adult patients with CSM underwent surgery
- Neither age, duration of symptoms before surgery, or severity of symptoms was related to clinical success after surgery - meaning they were **not** predictors of symptom relief.
- The only predictor found was **post-operative MRI**.
- Patients who had their cerebellar tonsils burned back - or manipulated in any way - fared **worse** than those who didn't.
- 88 % of patients who underwent dorsal-tenting duraplasty as part of the surgery **improved** post-operatively.

Definitions

bipolar coagulation - removal of tissue using an electric probe

cerebellar tonsils - portion of the cerebellum located at the bottom, so named because of their shape

cerebellum - part of the brain located at the bottom of the skull, near the opening to the spinal area; important for muscle control, movement, and balance

cerebrospinal fluid (CSF) - clear liquid in the brain and spinal cord, acts as a shock absorber

Chiari malformation - condition where the cerebellar tonsils are displaced out of the skull area into the spinal area, causing compression of brain tissue and disruption of CSF flow

cisterna magna - CSF filled space below the cerebellum

decompression surgery - common term for any of several variations of a surgical procedure to alleviate a Chiari malformation

dorsal tenting duraplasty - duraplasty procedure where the expanded dura is attached - or sutured - to another part of the

Looking For Predictors Of Surgical Success

Given the failure rate for decompression surgery can be as high as 30%, patients, surgeons, and researchers alike would benefit greatly from identifying predictors of surgical outcome. Some research has shown a correlation between duration of symptoms before surgery and clinical outcome - namely, the longer the symptoms have persisted, the lower the chance of a successful surgery. Unfortunately, this has not been conclusively proven and a recent report out of Germany may muddy the picture even further.

In a paper titled, *Surgical prognosis in hindbrain related syringomyelia*, published in the journal *Acta Neurologica Scandinavica*, January, 2003, Dr. Siamak Asgari and his colleagues at the University Hospital, Essen, reported finding no correlation between duration of symptoms and clinical outcome in a group of 31 patients.

Dr. Asgari and his team studied a series of adult patients with Chiari and syringomyelia, who were operated on between 1990-1997. In addition to a pre-surgery MRI, the patients were evaluated using a scale developed for this purpose (see Table 1). Points were assigned for various neurological impairments and totaled to classify the patient's symptoms as slight, moderate, or severe (see Table 2). All patients underwent decompression surgery - craniectomy, laminectomy, duraplasty - and were evaluated using MRI and the clinical scale post-operatively. MRI's were rated as showing either sufficient or insufficient decompression (see Table 3) and clinical improvement was defined as a change in score of 2 points or more.

Overall, 42% of the patients showed neurological improvement, 42% were unchanged, and 16% continued to get worse. Interestingly, the researchers were unable to find an association between patient age, symptom severity, or duration of symptoms (even though the average duration was 55 months) and clinical outcome. Dr. Asgari admits this goes against current thinking, but points out they have similar experience with another spinal disorder.

The researchers did, however, find an association between post-surgical MRI and clinical outcome, with 63% of patients with a "sufficient" decompression on MRI also showing clinical improvement. This is in contrast with only 17% of patients with an "insufficient" decompression on MRI showing improvement.

While a test done *after* surgery may not be the most useful predictor for patients, the German team also turned up some interesting results regarding surgical technique. In addition to the craniectomy, laminectomy, and duraplasty, 14 patients also had their cerebellar tonsils partially removed by bipolar coagulation. This is a very controversial procedure with many surgeons in favor of partial removal and many strongly opposed to it (see [New surgical technique attempts to minimize trauma for pediatric patients](#)). For the patients in this study it turned out to be a bad idea; **none** of the patients who had their tonsils manipulated in this way showed clinical improvement. Whereas, if you exclude this group, the success rate for the surgery goes up to 77%. Despite the controversy, and successful reports from other surgeons, Dr. Asgari feels their results are so strong that he and his colleagues no longer touch the tonsils during surgery.

A second surgical variable in the study was the use of dorsal tenting duraplasty during the decompression. In this technique, the expanded dura is attached to another structure - such as fibers in the neck muscles - to create a tent-like shape. Eight of the thirty-one patients underwent this technique, and the researchers found a strong association between the technique and clinical improvement - meaning a successful surgical outcome. It should be noted however, that none of the patients who underwent the dorsal tenting duraplasty had their tonsils manipulated.

It seems that for now the search for predictors of surgical outcome will continue as will the controversy surrounding specific surgical techniques. A randomized study where patients are assigned different surgical techniques would help clear up the confusion, but there are serious ethical problems with that type of study. For now, Dr. Asgari believes, as do many other neurosurgeons, that a successful decompression is highly dependent on the individual surgeon, but he adds that to improve the chance for success, "[a surgeon needs to] carefully select the optimal time point for surgery and perform an adequate decompression."

Table 1
Clinical Evaluation Scoring

Observation	Score
Cranial Nerve Involvement	2
Signs of spinal disease, but no difficulty with arms or walking	1

body creating a tent-like structure

duraplasty - surgical procedure where a patch is sewn into the dura, the covering of the brain and spinal cord

laminectomy - surgical removal of part (the bony arch) of one or more vertebrae

suboccipital craniectomy - surgical removal of part of the skull, or cranium, in the back of the head, near the base

syringomyelia - neurological condition where a fluid filled cyst forms in the spinal cord

vertebra - segment of the spinal column

Slight difficulty using arms/hands or walking; can work full-time	2
Moderate disability with arms/hands	2
Complete disability with arms/hands	3
Difficulty walking; prevents full-time employment	3
Need assistance to walk	4
Chairbound or bedridden	5

Table 2
Symptom Severity
(Total Score From Table 1)

Severity	Clinical Score
Slight	1-3
Moderate	4-6
Sever	7-10

Table 3
Post-operative MRI Findings

Sufficient: Wide artificial cisterna magna; collapse of the syrinx
Insufficient: Narrow artificial cisterna magna; persistence of the syrinx; extensive scarring and adhesions; slumping of the cerebellum

Source

Acta Neurologica Scandinavica;
Jan 2003; 107(1): pg 14.

[Home](#) | [About Us](#) | [Email](#) | [Donate](#) | [Get Involved](#) | [Privacy Policy](#)

Disclaimer: This publication is intended for informational purposes only and may or may not apply to you. The editor and publisher are not doctors and are not engaged in providing medical advice. Always consult a qualified professional for medical care. This publication does not endorse any doctors, procedures, or products.

© 2003-2020 C&S Patient Education Foundation