Key Points

1. When the dura is opened during Chiari surgery, the standard technique is to make a Y shaped incision.
2. Surgeons propose that more decompression can be achieved by making small cuts at the bottom of the Y as well.
3. They believe this relieves pressure over a critical area.
4. Successfully used this technique on six patients with no complications.
5. While there is not strong evidence that this technique is more effective; some other surgeons think it is a good idea.

Definitions

**arachnoid** - thin covering of the brain, lies underneath the dura.

**cervical** - the upper part of the spine; the neck area.

**craniectomy** - surgical technique where a piece of the skull is removed.

**dura** - thick, outer layer covering the brain and spinal cord.

**duraplasty** - surgical technique where a patch is sewn into the dura, thus making it bigger.

**laminectomy** - surgical technique where part of one or more bony vertebrae are removed.

**lumbar** - the lower back area.

**posterior fossa** - area in the lower part of the back of the skull where the cerebellum is situated.

**thoracic** - the middle part of the spine; the chest area.

**vertebra** - the individual bony segments of the spine; often referred to by region and number, such as C3 for the third cervical vertebra.

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

**cerebellum** - part of the brain.

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### Simple Idea To Improve Chiari Surgery

March 31, 2007 -- Neurosurgical journals often publish short papers on innovations in specific surgical techniques. Chiari & Syringomyelia News has not reported on these in the past because the topics are often extremely technical, narrow in scope and can be difficult to understand for lay people.

However, an operative technique paper published recently in the February, 2007 issue of the journal, Neurosurgery, describes an idea that is actually simple to understand and may have a broad impact on the Chiari standard of care. In the report, neurosurgeons Fahrad Pirouzman and William Tucker of the University of Toronto describe a simple modification to the standard duraplasty procedure.

Recall that a duraplasty is the part of a Chiari decompression where the dura, the outer covering of the brain, is cut open and a dural patch is sewn over the opening. The goal of a duraplasty is to create more space for the crowded cerebellar tonsils which lie underneath and allow for CSF to flow more normally.

In the traditional, and widely accepted, duraplasty, a Y shaped incision is made, the edges of the dura are pulled back and the patch is sewn over the opening (see below).

![Standard Y Dura Incision](image1)

The variation described by the Canadian surgeons entails making two additional, angled cuts at the bottom of traditional Y incision (see below).

![Expanded Dura Incision](image2)

Although the extra cuts are small, they allow the dura to be pulled open, or expanded, significantly more, especially at the bottom of the duraplasty. And as the surgeons point out, this area is right where the brain and spine meet and is where CSF flow is usually abnormal in Chiari patients. Thus, at least theoretically, creating more space there with an expanded duraplasty is a good thing. It is interesting to note that following the trend towards minimal surgery, the surgeons try to leave the arachnoid underneath the dura intact, and avoid entering the CSF system directly.

Although they provide few specifics, the doctors do report good results in six patients they have used the technique with. The group experienced no CSF leaks or other complications and only one patient did not improve after surgery, likely due to extensive scarring and CSF blockage underneath the arachnoid.

While it would be ideal to see a randomized trial comparing this new technique to the traditional duraplasty to prove that the new one has real benefits, such a study is very unlikely. The reality is that surgeons modify and develop new techniques all the time based on their knowledge and experience base. They then publish their ideas and results which leads to other surgeons trying the techniques and publishing their own results and thoughts. In this way ideas are debated in the medical literature and at conferences and eventually some ideas become widely adopted in the community. Although this system is not ideal scientifically, it would simply take too long and way too much money to rigorously study each and every surgical variation.

Based on comments published in the journal issue, it appears the idea of an expanded duraplasty may quickly...
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 I - 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

decompression surgery - general term used for any of several surgical techniques employed to create more space around a Chiari malformation and to relieve compression

Source

Source: Pirouzmand F, Tucker W. A Modification Of The Classic Technique For Expansion Duraplasty Of The Posterior Fossa. Neurosurgery. 2007 Feb; 60

Intraoperative Pictures of Expanded Duraplasty

Incisions/Resection Of Dura

Dural Patch

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