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 vertebra 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

Simple Idea To Improve Chiari Surgery

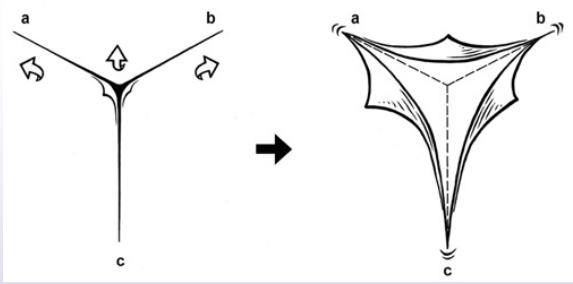
March 31, 2007 -- Neurosurgical journals often publish short papers on innovations in specific surgical techniques. Chiari & Syringomyelia News has not reported on these in the past because the topics are often extremely technical, narrow in scope and can be difficult to understand for lay people.

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 Pirouzmand 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.

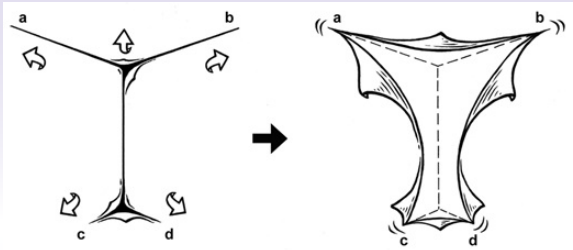
In the traditional, and widely accepted, duraplasty, a Y shaped incision is made, the edges of the dura are pulled back and the patch is sewn over the opening (see below).

Standard Y Dura Incision



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



Although the extra cuts are small, they allow the dura to be pulled open, or expanded, significantly more, especially at the bottom of the duraplastly. 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

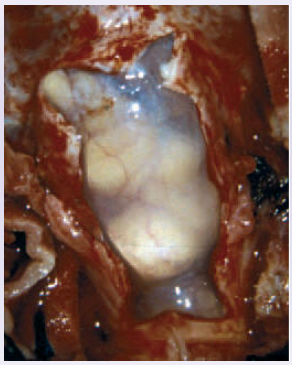
Source

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

gain some converts. Dr. Edward Benzel of the Cleveland Clinic writes, "[The technique] is so simple and yet so apparently effective. The authors are to be congratulated for their insight and innovation. I will use this technique with my next Chiari I case."

Conquer Chiari takes the position that patients should educate themselves so that they can make informed, intelligent healthcare decisions. Those decisions may not go to the level of a traditional duraplasty versus an expanded duraplasty, but wouldn't it be good to know that your selected surgeon knows the difference and has thought about which is better?

Intraoperative Pictures of Expanded Duraplasty



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