

Key Points

1. Pain affects upwards of 90% of Chiari and syringomyelia patients and is complicated to understand and deal with
2. Living with chronic pain has numerous effects on a person's health and well being
3. Researchers have tried to find predictors of who will improve with surgery
4. Study looked at 13 Chiari and syringomyelia patients to see what affected their pain after surgery
5. Found that syrinx width and duration of symptoms were related to outcomes
6. Interestingly, the surgeons chose to coagulate the cerebellar tonsils on all patients and advocate that approach
7. Study is limited by the small number of patients involved

Definitions

allodynia - a painful response to a stimulus which does not normally cause pain

cervical - having to do with the neck

craniectomy - surgical technique where part of the skull is removed

dysesthesia - an unpleasant sensation, such as burning, which occurs either spontaneously, or in response to a stimulus which should not cause pain

dura - thick, outer covering of the brain and spinal cord

duraplasty - surgical technique where the dura is opened and expanded with a patch

laminectomy - surgical technique where part of one or more vertebra is removed

occipital - having to do with the back of the head

Syrinx Width/Symptom Duration Predict Pain Improvement

March 31st, 2009 -- With up to 90% of Chiari and syringomyelia patients reporting pain as a primary symptom, it is not surprising that researchers have focused on trying to find factors that can predict whether pain will improve after surgery. Although it seems logical that the longer a person has symptoms before undergoing surgery, the more likely they are to have persistent problems, not every study has found this to be the case. Other research studies have looked at, inconclusively as well, whether the size, shape, and location of a syrinx affects outcomes. Interestingly, one factor which has been shown to strongly affect outcomes in a negative way in adults is the presence of scoliosis. However, the end result of all this research is that as of today it is impossible to say, on an individual level, which patients will continue to have problems after surgery and which won't.

Perhaps one reason predicting pain outcomes is such a difficult challenge is that the pain associated with Chiari and syringomyelia is often multi-faceted in nature, meaning that a person may suffer from one than one type of pain. For example, a typical patient may experience headaches, muscular pain due to motor nerve damage, and neuropathic pain due to sensory nerve damage. It is this latter type of pain which is especially difficult to treat.

Neuropathic pain is defined as pain due to damage to a nerve, and is often experienced as a burning type pain. The pain can be in response to what is not normally a painful stimulus, such as a light touch (this is known as allodynia), or can even arise spontaneously. Neuropathic pain is associated with conditions other than syringomyelia, most notably diabetes, and as such has attracted millions of dollars of research into finding drugs to treat it, but unfortunately with limited success. [**Author's Note:** I suffer from allodynia in the neck and shoulder area; basically any type of contact there is very uncomfortable for me. This is of course is problematic in wearing collared shirts and even more so jackets.]

Also unfortunate is the high cost which chronic and neuropathic pain can take on a person. Research has identified a laundry list of problems brought on by living with pain, including high blood pressure, decline in overall health, depression, and loss of cognitive skills. One study even used imaging to show that chronic pain can actually damage the brain outright.

Against this backdrop of pain research, a study from Spain (Prat & Galeano) published on-line in the Journal of Clinical Neuroscience has found that the width of a syrinx and symptom duration are related to pain improvement in syringomyelia patients. To determine this, the researchers looked at 13 consecutive patients who underwent surgery at their facility (Figure 1). Prior to surgery, the type of pain for each patient was noted as either occipital, cervical, or radicular. In addition, pain levels and symptom duration were recorded. From MRIs, both the length of the syrinx (in vertebra) and the width were calculated. The width of the syrinx was classified as either greater or less than 75% of the spinal cord width.

After surgery, patients were assessed right after the operation and again at 12 months. Pain levels were again noted as either none, mild, moderate, or severe. MRIs were taken and clinical outcomes were assessed using the Bidzinski scale.

Of the 13 patients in the study, the average duration of symptoms was 44 months. Six of the group had syrinxes less than 75% of the width of the spinal cord and seven had larger syrinxes. Each patient underwent surgery which involved craniectomy, laminectomy, duraplasty, and tonsillar coagulation, meaning the cerebellar tonsils were reduced in size. Although not directly relevant to the main point of the research, the authors of this study argue fairly strongly in support of tonsillar coagulation. They cite other research which shows better outcomes and very few problems associated with the technique.

All told, the pain improved for 11 patients and got worse in 2. In terms of the syrinx, in six patients it resolved completely and in the other seven it improved. Finally by the Bidzinski scale, 5 patients had very good outcomes, 6 had good outcomes, and two had bad outcomes.

Although the numbers are small, the researchers did find a statistical correlation between the width of the syrinx prior to surgery and pain improvement. Specifically, if the width was less than 75%, then patients were significantly more likely to improve in terms of pain than if the syrinx was greater than 75%. Interestingly, the length of the syrinx was not related to pain improvement, but it was related to improved outcome on the Bidzinski scale. Perhaps not surprisingly, duration of symptoms was found to be related to both pain improvement and the Bidzinski outcomes.

One curious.htmlct of this study is that the researchers mixed headaches - which are associated mostly with Chiari - and types of pain which are more related to syringomyelia. Why they did this, or what effect it had on the results is not clear.

radicular - having to do with nerve root; radicular pain is actually pain in an extremity that is due to damage to a nerve root

scoliosis - abnormal curvature of the spine

tonsillar coagulation - surgical technique where the cerebellar tonsils are reduced in size using heat

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

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

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

Source

[Pain improvement in patients with syringomyelia and Chiari I malformation treated with suboccipital decompression and tonsillar coagulation.](#) Prat R, Galeano I. J Clin Neurosci. 2009 Apr;16(4):531-4. Epub 2009 Feb 23.

Although this work is similar to a lot of Chiari research in that it involves only a small number of patients and has scientific limitations, its findings that syrinx width and duration of symptoms are linked to outcomes certainly make sense, and could serve as a starting point for larger, more rigorous research.

Figure 1: Selected Characteristics and Outcome Measures of Patients (13 Total)

#	Pain Type	Pre-op Syrinx Width	Post-op Pain	Clinical Outcome Scale
1	H	<75%	Impr	VG
2	C	>75%	Impr	VG
3	H	>75%	Impr	Good
4	R	>75%	Impr	Good
5	R	<75%	Impr	Good
6	H	>75%	Impr	Good
7	R	<75%	Impr	Good
8	H	>75%	Worse	Bad
9	H	<75%	Worse	Good
10	C	>75%	Impr	Bad
11	H	<75%	Impr	VG
12	R	>75%	Impr	VG
13	R	<75%	Impr	VG

Notes: H=headache; C=cervical; R=radicular; VG=very good

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