Key Points

1. Study followed 9 asymptomatic patients with syrinxes, who did not have surgery, for more than ten years
2. Only one person developed any neurological problems and required surgery
3. Syrinx diameter, syrinx length, and extent of tonsillar herniation were not statistically different from a control group of symptomatic patients who underwent surgery
4. Syrinx size and extent of herniation are not good predictors of who should have surgery
5. Surgery may not be necessary if there are no symptoms or neurological involvement, even if there is a syrinx
6. It is unknown why some people are symptomatic and some aren't

Definitions

asymptomatic - having no symptoms

benign - not dangerous to your health

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

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

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

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

lumbar - the lower part of the spine; the lower back

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

Is Surgery Necessary If There Are No Symptoms?

Whether to have surgery is one of the most important decisions a Chiari or syringomyelia patient will face. And with no definitive test to say who should and shouldn't, patients are left to rely on the judgment and experience of their doctors. For some, the decision is easy; years of worsening symptoms and extensive neurological involvement make the choice a no-brainer (pun intended). Recently however, the extensive use of MRI's has created a group of patients for whom the choice is not so straightforward.

MRI's have revealed that a surprising number of people actually have some degree of tonsillar herniation but show no symptoms. Most surgeons agree that for a Chiari malformation, if there are no symptoms, the situation can be managed with careful observation and surgery is not necessary.

But what if there is also a syrinx? For some doctors, the presence of a syrinx is the trigger to perform surgery, as a syrinx can cause nerve damage. However, a study out of Japan has shown that early surgery may not be necessary - even with a syrinx - if there are no symptoms. Dr. Shigeru Nishizawa and his colleagues from Hamamatsu University, in Japan, followed nine people with Chiari and a syrinx - but no symptoms - for more than 10 years. They published their results in the September, 2001 issue of the journal Neurosurgery.

The nine patients were initially seen for reasons other than Chiari. Three went in because of headaches (but not the kind usually associated with Chiari), three went in for brain check-ups, two were seen for head injuries, and one for sinus problems. Initial MRI's revealed a Chiari malformation in every patient, and follow-up scans revealed syrinxes as well. Neurological exams showed that some patients had some abnormal reflexes in their arms and legs, but overall were fairly normal. Because of the lack of symptoms and neurological signs, the subjects decided against surgery and opted for careful observation.

For the next 10+ years, the subjects were evaluated every six months with MRI's and neurological exams. During that time, one patient developed some problems with his hand seven years later and decided to undergo surgery, but the remaining eight were completely stable and did not develop any symptoms or neurological problems. In addition, the MRI's showed that the syrinxes and Chiari malformations - for all nine patients - did not change over the ten year period.

In an attempt to identify parameters that could be used to indicate surgery is necessary, the researchers used the MRI's to measure the width of the syrinx (at it's widest point), the length of the syrinx, and the length of the tonsillar herniation (See Figure 1). They then compared these results with data taken from a control group of 11 patients with symptomatic Chiari and syringomyelia who underwent surgery because of their condition.

Surprisingly, there was no significant difference, for any of the parameters, between the groups (See Figure 2). In fact, the average width of the syrinx and the average length of herniation were remarkably similar for the two groups. The researchers concluded these parameters were not useful for making a surgical decision and instead suggest focusing on whether there is progression of symptoms, neurological problems, or MRI fingings.

The group also points out that extreme caution must be used in choosing to not have surgery. This small group of patients does not mean that every asymptomatic syrinx will stay that way. In fact, rapid deterioration and sudden onset of symptoms is well documented, especially with large syrinxes. The doctors stress that patients who do not have surgery must be carefully observed for any signs of symptoms or syrinx progression.

While this study clearly shows that early surgery isn't always necessary when there are no symptoms, it appears the mystery of why some people are asymptomatic while others suffer from a myriad of symptoms will remain, for the time being, unsolved.

Figure 1
MRI Parameters of the Asymptomatic Group

Patient Number	Syrinx Diameter (mm)	Syrinx Length (vertebra)	Tonsillar Herniation (mm)
1	8.7	C2-C7	11.0
2	8.5	C1-T2	11.2
3	9.1	C2-C6	11.1
4	9.0	C2-C6	10.9
5	9.1	C2-C7	10.8
6	8.6	C2-C7	10.8
7	8.9	C1-T2	11.0

thoracic - vertically, the middle part of the spine; the chest area

tonsillar herniation - displacement of the cerebellar tonsils out of the skull; usually measured in mm below the bottom of the skull

vertebra - segment of the spinal column, noted as region plus number (C = cervical, T = thoracic, L = Lumbar)

8	9.0	C2-C7	11.1
9	8.7	C2-T1	11.0

Figure 2
MRI Parameters,
Symptomatic Vs Asymptomatic

Symptoms	Avg Syrinx Diameter (mm)	Syrinx Length (vertebra)	Avg. Tonsillar Herniation (mm)
No	8.8	C1-T2	11.0
Yes	8.9	C1-T3	10.8

- **There was no statistically significant difference between the MRI parameters of the two groups**

Source

Nishizawa et al. Incidentally Identified Syringomyelia Associated With Chiari I Malformations: Is Early Interventional Surgery Necessary? Neurosurgery Sep 2001 49(3), 637-41.