Key Points

1. Post-traumatic syringomyelia (PTS) is a very serious complication of spinal cord injuries (SCI)
2. Not well understood and incidence, treatment, and exact cause are not known
3. Up to 20% of SCI patients may develop PTS, months to years after initial injury
4. Study reviewed PTS cases in NE England
5. Identified incidence of .02%; PTS was more likely after thoracic injury
6. Not clear if initial surgery helps prevent PTS
7. Out of 16 PTS patients, 5 improved and 5 were stabilized after surgical intervention

Definitions

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

cervical - relating to the upper portion of the spinal cord, the neck area

complete spinal cord injury - type of spinal injury where there is no feeling or motor control below the level of injury

incidence - the number of new cases of a disease or disorder in a given group of people

incomplete spinal cord injury - type of spinal injury where there is some feeling or motor control below the level of the injury

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

lumbar - relating to the lower part of the spinal cord, or the lower back

MRI - Magnetic Resonance Imaging; diagnostic device which uses a strong magnetic field to create images of the body's

Post-Traumatic Syringomyelia In England

Post-traumatic syringomyelia (PTS) is a very serious, even devastating, complication of spinal cord injury (SCI). Research has shown that even people who have mentally and emotionally come to grips with their SCI are often thrown into a depression over the pain and progressive symptoms associated with PTS. In a cruelly ironic twist, PTS syrinxes often form slightly above the initial injury, and thus can be extremely painful.

Despite the serious nature of PTS, there is very little published literature on the topic. A PubMed search (with post-traumatic syringomyelia as the search term) revealed only 24 citations since the year 2000. Reflective of this dearth of research, there is very little that is well understood about the condition.

Initially, the incidence of PTS associated with spinal cord injuries was thought to range from less than 1% to about 3%. However, in recent years, researchers have proposed that the rate may be much higher, even upwards of 20%. Complicating the analysis of how many people develop PTS is the fact that it can develop months to years after the initial injury. Also, it is likely that many SCI patients develop a syrinx, but do not develop any symptoms.

There are several theories regarding the mechanism from which a spinal cord injury leads to PTS. Like Chiari related syringomyelia, most of them center around the disruption of the natural flow of cerebrospinal fluid (CSF) in the area around the injury. Recently however, a model of PTS has been proposed which focuses on the release of acids after a traumatic injury. The exitotoxic model of PTS puts forth the notion that after a spinal cord injury, the body releases a significant amount of amino acids. These acids result in cell death in the spinal cord. The body's immune system then acts to clear away the dead cells and in doing so walls off the area, thus creating a cavity. As fluid gets into this cavity, a syrinx forms.

This lack of understanding regarding the underlying mechanism of PTS has resulted in controversy surrounding its treatment as well. For many years, PTS was treated by inserting a shunt to directly drain the syrinx. Outcomes from this procedure were not very good however, and recently some surgeons have begun to essentially perform a decompression on the area in an effort to restore CSF flow.

Against this backdrop of unknowns, a paper published in the May, 2005 issue of the journal Spine retrospectively reviewed PTS cases at a spinal injury center in North East England. Aine Carroll and Paula Brackenridge, both with the Hexham Spinal Injuries Unit - which serves a population of about 3 million people - identified and analyzed 16 PTS cases out of over 800 spinal cord injuries treated there.

The incidence rate they identified, .02% of SCI cases, is very low compared to other reports and may not reflect the real overall PTS incidence, but it is indicative of the variability of reports. Of the 16 PTS cases 9 developed after thoracic spinal cord injuries, and 5 after cervical injuries (see Table 1). This result is in line with prior publications which have demonstrated an increased risk after thoracic injury compared to other locations.

The syrinxes in the PTS group developed anywhere from 6 months to 25 years after the SCI (see Table 2), but nearly half the group was symptomatic within 5 years of the initial injury. The most common symptoms were pain and reduced sensation. Loss of power, abnormal sensation, and muscle spasms were also reported.

All but one of the patients were treated surgically, with more than half receiving a shunt to directly drain the syrinx. After surgical treatment for the PTS, 5 patients improved in regards to symptoms, 5 were stabilized, 4 continued to deteriorate, and one person died from complications secondary to the PTS. With these results, if treatment success were defined as an improvement in symptoms, the success rate of the surgery would be around 33%, an extremely poor outcome. If the definition of success is broadened to include stabilizing of symptoms, the success rate climbs to approximately 66%, which while better, is still not very good. Results like these is why surgeons have begun to turn away from shunting in search of other options.

In discussing and summarizing their findings, the authors point out that PTS is likely under diagnosed, that it is not clear if initial surgery reduces the likelihood of developing PTS, and that the benefits of surgery for PTS are unclear. They go on to stress that until large, multi-center studies are undertaken, it is unlikely that PTS will be fully understood.

Table 1
Level of SCI Leading To PTS
(16 Total Patients)

Level	#

internal parts

post-traumatic syringomyelia - syringomyelia which develops after a spinal cord injury

shunt - a tube like device which is implanted in the body to drain CSF and divert it to somewhere else in the body

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

thoracic - relating to the middle part of the spinal cord, the chest area

Source

Carroll AM, Brackenridge P. Post-traumatic syringomyelia: a review of the cases presenting in a regional spinal injuries unit in the north east of England over a 5-year period.
Spine. 2005 May 15;30(10):1206-10.

Cervical	5
Thoracic	9
Lumbar	0
Thoracolumbar	1
Unknown	1

Table 2
Time Between SCI and PTS

Time Interval	#
0-5 Years	7
6-10 Years	1
11-15 Years	1
16-20 Years	2
21-25 Years	2
Unknown	3

Table 3
PTS Symptom Outcomes

Outcome	#
Improved	5
Stable	5
Worse	4
Died	1
Unknown	1

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