

Assessing the Effectiveness of Physical Therapy for Chiari Related Neck and Shoulder Pain and Disability

Hypothesis: Chiari and syringomyelia patients experience pain, spasticity, weakness, and limited functionality of the neck, shoulder, and upper back area. This arises both from the associated nerve compression and damage of the disorders, as well as generally unreported morbidity associated with muscle dissection and bone removal during corrective decompression surgery. A structured program of physical therapy will reduce pain and increase functionality of these muscles, which in turn will translate into a faster recovery period for post-surgical patients as well as an improved quality of life for long term patients.

Specific Aims:

1. Determine and quantify the effect(s) of a structured physical therapy program on neck strength and mobility, shoulder strength and mobility, upper back strength, and self-reported pain and quality of life for:
 - a. Chiari patients who have undergone recent decompression surgery
 - b. Long-term Chiari patients
2. Determine what, if any, physiological factors (length of herniation; syrinx length, width, location, etc), clinical factors (duration of symptoms; extent of laminectomy; etc.), demographic factors, and therapy variables (modalities used, adherence to plan, etc) influence the effect a structured physical therapy program has on Chiari patients.

Background & Significance:

- Neck pain is one of the most common and problematic symptoms for CM/SM patients
- Decompression surgery can exacerbate this problem from dissecting muscles and laminectomies
- Currently there are no PT standards. Some neurosurgeons recommend PT, others don't.
- Many CM/SM patients have suffered from symptoms for years and can have significant muscle weakness and atrophy.
- Many CM/SM patients are afraid of physical activity because they don't want to do more harm. This results in long-term patients becoming sedentary, which in turn can make the pain and weakness worse.
- The benefits of a properly supervised program of physical therapy for patients with CM/SM has not been documented.

Preliminary Studies: There is virtually no published research involving structured physical therapy programs and Chiari.

Research Design & Methods:

General Design – Multicenter, prospective, controlled design for recent post-op. No control group for long-term group.

Subjects –

- Inclusion = Adult patients with CM/SM who have undergone decompression surgery. Physician clearance and referral for PT.
- Exclusion = Other spine issues or bony abnormalities which cause neck pain. Any medical condition which would contraindicate PT. Fusion surgery.
- Group A = Recent decompression. Enroll prior to surgery. PT program within a defined time range after surgery.
- Group B = Long-term patients, with long term defined as more than 12 months post-op with or without PT. (Note: can recruit participants through Conquer Chiari website)
- Group C = Recent decompression control group, but no PT.
- Group D= Optional: Home exercise program structured by PT but not directly supervised.

Data Collection –

- Demographic: Sex, Age
- Clinical: primary symptom(s), duration of symptoms, extent of laminectomy, surgical complications
- Imaging: Length of herniation, syrinx length and width
- Self-Report: VAS Pain Scale before/after each PT session, SF-36 before/after entire therapy program and/or additional validated, relevant self-report measures
- Therapy: Beginning/end ROM, strength, etc.; record of sessions, exercises, modalities, etc.

PT Program –

- Classification of patients using the guide to physical therapy criteria
- Documented progression for ROM, strength, neuromuscular re-education and postural education
- Program length could be anywhere from 4-8 weeks with Home exercise program also implemented.

Treatment Contraindications -

- Avoid neck/spinal manipulation
- Upper cervical massage (physician guidance per patient)
- Avoid extensive neck extension/flexion (physician guidance per patient)
- Watch for headaches, tingling, numbness, etc.

Analysis –

- Compare gains in ROM, strength, pain, and QoL between Groups A and C.
- Compare pre and post ROM, strength, pain, and QoL for Group C
- Identify factors which contribute to variance in gains
- Optionally compare Group D to Group C for above outcome measures

Limitations –

- No comparison group for Group B
- Sampling bias for Group B
- Surgical and clinical variables difficult to match for control group
- Inherent variability in surgical techniques used
- Inherent variability in PT techniques used