

# Complementary and alternative medicine for tethered cord and hypermobility syndromes

## Abstract

Hypermobility syndromes are frequently associated with neurological symptoms such as pain, fatigue, headache, paresthesia and autonomic dysfunction. These symptoms may reflect overlapping contributors including cerebrospinal fluid (CSF) disturbances, craniocervical instability, Chiari malformation, altered intracranial pressure, and tethered cord syndrome (TCS). Although surgical intervention is commonly discussed for symptomatic tethered cord, both diagnosis and management remain controversial, particularly in hypermobile populations. This article examines complementary and alternative medicine (CAM) approaches as adjunctive, non-surgical strategies for symptom modulation in individuals with tethered cord and hypermobility syndromes. Approaches discussed include breathing exercises, guided visualization, cranial therapy, acupuncture and acupressure, and muscle energy techniques, drawing from osteopathic medicine, Traditional Chinese Medicine, and integrative manual therapy frameworks. Proposed mechanisms include autonomic regulation, diaphragmatic stabilization, cerebrospinal fluid dynamics, and neuromyofascial continuity. While CAM approaches are not standard treatments for tethered cord syndrome, they may offer symptom relief and functional support for selected patients and warrant further investigation within integrative care models.

Volume 19 Issue 2 - 2026

Kimberly Burnham

Independent Scholar, Akamai University, USA

**Correspondence:** Kimberly Burnham, PhD, Integrative Medicine, Independent Scholar, Akamai University, USA**Received:** February 16, 2026 | **Published:** March 12, 2026

## Introduction

Neurological symptoms associated with hypermobility include fatigue, pain, headache, muscle weakness, and paresthesia with ranging severity. Symptoms can be due to a variety of manifestations and comorbidities including autonomic dysfunction, cerebral spinal fluid (CSF) leaks, Chiari malformation, upper cervical spine instability, changes in intracranial pressure, migraine, and tethered cord syndrome (TCS). This can also contribute to neuropathy and headaches.<sup>1</sup>

Hypermobility syndromes, including hypermobile Ehlers–Danlos syndrome (hEDS) and hypermobility spectrum disorders (HSD), are connective tissue conditions characterized by excessive joint mobility, ligament laxity, and widespread musculoskeletal symptoms. Individuals with hypermobility often experience chronic pain, fatigue, headaches, dysautonomia, and neurological complaints related to instability or altered connective tissue support throughout the body. One neurological condition that may occur in association with spinal dysraphism or connective tissue abnormalities is tethered cord syndrome (TCS). TCS occurs when the spinal cord becomes abnormally attached to surrounding structures, creating pathological tension on the cord and nerves as the body moves or grows. Symptoms may include back pain, lower-extremity weakness, sensory changes, bladder dysfunction, and gait abnormalities. Tethered cord syndrome is considered rare, with estimates suggesting an incidence of approximately 0.25 per 1,000 births or about 1 in 4,000 births in the general population, although rates may be higher in individuals with spinal dysraphism or related conditions.<sup>2</sup>

There are a number of Complementary and Alternative Medicine (CAM) approaches that can help alleviate or lessen this constellation of symptoms, including breathing exercises, acupuncture/acupressure, visualizations, cranial therapy, muscle energy techniques (MET) and other manual therapy approaches.

## Breathing exercises

Breathing exercises can stabilize the spine and relax postural muscles, so the individual can function pain-free. The respiratory diaphragm helps stabilize the lumbar spine. If too much effort is going into stabilizing and too little energy is going into breathing then the accessory muscles kick in, which is usually only when the individual is doing strenuous work. Accessory muscles of inspiration include Sternocleidomastoid (SCM) (postural muscle) and pectoralis minor. Accessory muscles of exhalation include abdominals and quadratus lumborum (postural muscle). Focusing on breathing for a few minutes a day can increase efficiency of the respiratory diaphragm as well as allow postural muscles like the SCM and quadratus lumborum to do more stabilization.

Lay in a relaxed position and breathe slowly in and out. Rest one hand over the respiratory diaphragm and the other over the pelvic region. As you breathe, feel the movement of the respiratory diaphragm and rib cage. Focus on a slow smooth movement then focus on relaxing the low back. Let the sacrum and lumbar spine sink further into the bed with each out breath. Notice how the hand on the pelvis, the whole pelvic region, and the low back sinks towards the bed as you relax and breathe.

While CAM is not standard practice for a Tethered Cord, surgery is also not without controversy, one journal noted, “few topics in pediatric neurosurgery generate as much controversy, debate, or angst as the diagnosis of tethered spinal cord. As is often the case in surgery, the controversy is fueled by plausible explanations and strong convictions based largely on anecdote, and its intensity is all the greater because of a lack of good data. Patients with alleged tethered spinal cords are fairly common in pediatric neurosurgical practice. Walking the fine line between over- and undertreatment seems a rational approach until better information becomes available. Rather than discuss each possible abnormality, it seems reasonable to address the common presentations individually, beginning with

the most severe, where surgery is least questioned, moving to the “almost” normal cases—in which surgery might almost be regarded as an alternative therapy joining the ranks of craniosacral therapy, acupuncture, and cupping.”<sup>3</sup> Here are more approaches that may help decrease symptoms in a non-surgical way.

### Visualization and blood flow

The following exercise can be done with a client or another person or modified slightly to work on your own spine. In Traditional Chinese Medicine we have a saying, “Where the mind goes, energy follows. Where energy goes, blood follows. One of the benefits of visualization is that blood flow to the area of focus increases.

In an article that looked at the neural pathways of meditation, cerebral blood flow (CBF) responses in focused-based meditation and a breath-based practice, researchers said, “We observed strong correlations between depth of meditation and neural activity in the left inferior forebrain areas including the insula, inferior frontal cortex, and temporal pole. This study revealed changes in the brain during two different meditation practices in the same individuals and that these changes correlated with the subjective experiences of the practitioners.”<sup>4,5</sup>

Another study noted, “The autonomic nervous system is the main determinant of the blood flow directed towards a body part, and it is tightly connected to the representation of the body in the brain. These findings suggest that modulating the representation of a body part [movement and visualization] impacts its blood perfusion.”<sup>6</sup>

### Visualization of the spinal cord differentiation

Begin by placing your hand on the lower back, right where the ribs end and the fleshy part of the waist begins. Beneath your palm is the skin, cool or warm? Just under that is a layer of subcutaneous fat and a tough, silken sheet of fascia that holds everything in place. Feel the thick, rope-like pillars of the erector spinae muscles on either side of your spine. These are the powerful anchors that keep you upright. Press your fingers into the midline. You are touching the spinous processes—the bony “fins” of the vertebrae. Visualize the T12 vertebra at the top of this section and follow the bumpy ridge down through the five Lumbar vertebrae until the bone becomes a solid, flat shield: the Sacrum, ending in the tiny, curved Coccyx.

Imagine your awareness moving through the bone and into the hollow Spinal Canal. Before you hit the neural tissue, you pass through a protective “buffer zone” filled with soft fat and a network of small veins. This space ensures the spinal structures can move without friction against the bone. You encounter a tough, leather-like sleeve called the Dura Mater. This is the “Hard Mother,” the outermost protective layer of the meninges. It is not attached to the bone here; it floats within that fatty epidural space. Now, move through the Dura and the thin, cobweb-like Arachnoid Mater into the Subarachnoid Space, which is filled with clear, buoyant Cerebrospinal Fluid (CSF).

At the level of L1 or L2 (just below your T12 starting point), the solid spinal cord comes to a tapered point. This is the Conus Medullaris. Below the Conus, the solid cord ends, but the nerves continue. Visualize a “horse’s tail” of long, shimmering silver threads floating freely in the fluid. These are the nerves traveling down to your legs and pelvis. Most of these nerves are separate and free-floating in the fluid to allow you to bend and twist. However, look at the very center: a single, glistening thread called the Filum Terminale. Unlike the floating nerves, this thread pierces through the bottom of the dural sac and travels all the way down to the very tip of your spine. Visualize this thread firmly rooting into the back of the Coccyx. This

is the anchor that tethers your entire spinal cord, providing the tension and stability needed for your nervous system to remain centered as you move through the world. Once you have visualized and engaged your body’s attention with the spinal cord, it is time to move on to a Cranial Technique.

### Cranial rhythm technique

A manual therapy technique known as CranioSacral Therapy or Cranial Therapy focuses on the brain, spinal cord, nerves in the body and organs. The Cranial rhythm impulse (CRI) can be palpated globally or specifically as an expansion and contraction of the tissue (brain, spinal cord, liver, etc). This is sometimes described as relaxation and expansion of the tissue. The rate of the rhythm varies with the type of tissue palpated and with the health of the tissue but often noticed at a rate of 6-12 cycles per minute. It is slower than the heart rate 60–100 beats per minute or respiration at 12–20 breaths per minute. Once you perceive the rhythm, one technique from both Cranial Osteopathy and Integrative Manual Therapy (IMT) is to resist this motion. Follow the rhythm in and resist it coming out (expansion) in the cranium or along the spine. Resist for a few seconds to a few minutes. Often this will result in a still point, a cessation of the rhythm, thought to be a time when the body heals and reorganizes.

In a 2021 article, researchers noted, “Central to the osteopathic cranial field, and at the same time controversial, is the concept of a unique rhythmic movement believed to originate from a primary respiratory mechanism (PRM). Further, the PRM is reported to manifest as a cranial rhythmic impulse (CRI) on the living human skull.” They found, “in all individuals, a third rhythm was distinguished as separate from the arterial and respiratory rhythm at all times. The third rhythm was observed as a dynamic physiological phenomenon with a narrow range in resting healthy individuals with a mean of 6.16 cycles/minute (4.25-7.07). The significant contribution to the amplitude of the measured movements was the respiratory breathing and this third rhythm, whereas the contributions from the arterial pulsing were minor.”<sup>7</sup>

### Palpating and treating with cranial rhythm

Place one hand at the sacrum and L5-S1 junction as the client lays relaxed on a massage table. Place the other hand under the head focused on the cerebellum, occiput, and Cranial rhythm impulse (CRI). Notice the warmth, the flexibility, the flow of cerebrospinal fluid around the brain and spinal cord. What changes as you visualize the skin, muscles attached to the spinal cord, the dura or tough connective tissue layer around the cord. Does the cord feel free with each neuron differentiated and free to work with the spinal cord as a whole? Visualize with the client, the layers between your hands from the skin to the individual fibers of the spinal cord and lobes of the brain.

### Acupuncture and tethered cord

A fourth way to address a tethered cord is to use acupuncture or acupressure. Qui Z et al.,<sup>8</sup> defines tethered cord syndrome (TCS) as a diverse clinical condition wherein excessive tension on the spinal cord produces a variety of symptoms and signs. Its clinical symptoms include motor deficits, deformities of the lower extremities, lower leg sensory deficits, pain in the lower extremities, back pain, and dysuria. Current treatments mainly focus on surgical treatment to arrest the progression of the TCS. We present a case where the patient’s symptoms improved significantly after the acupuncture treatment.”

Hara (2024) explains, “Tethered cord syndrome is a condition in which the spinal cord is tethered by pathological structures

such as a tight filum terminale, intradural lipomas with or without a connecting extradural component, intradural fibrous adhesions, diastematomyelia, and neural placode adhesions following closure of a myelomeningocele.”<sup>9</sup>

A 2020 study looked at the use of Korean acupuncture, “Filum terminale lipoma is an inherited lumbosacral abnormality that can cause tethered cord syndrome. This report describes an unusual case of lumbago and sciatica, pain suspected to be caused by a filum terminale lipoma where a herniated intervertebral disc had occurred. The patient was hospitalized for 43 days and received integrative Korean medicine treatment, including acupuncture, pharmacopuncture, Chuna therapy, cupping therapy, physiotherapy and herbal medicine. Treatment effectiveness was assessed using the numerical rating scale, Oswestry Disability Index, European Quality of Life 5-Dimensions, and patient symptoms. After inpatient treatment, the pain the patient suffered was significantly reduced, and the evaluation indices scores reflected this. Integrative Korean remedies may be an effective option for lower back pain and lower extremity symptoms which are caused by filum terminale lipoma where a herniated intervertebral disc has occurred.”<sup>10</sup>

Other techniques from Traditional Chinese Medicine focused on the Water elements, Kidney and Bladder meridians can also be useful in the treatment of a Tethered Cord. These can take the form of a color visualization as the color blue is associated with the Water Elements or acupuncture or acupressure along the Kidney and Bladder meridians in the back and legs. Work on these two meridians can often be helpful when tethering or injury leads to sciatic pain going down the legs.<sup>11</sup>

One study noted, “those who received acupuncture within 3 weeks after injury had significantly shortened the total days to achieve a balanced bladder, as compared to those who received acupuncture 3 weeks after spinal cord injury.” The acupuncture group received electroacupuncture at four acupoints: Chung Chi (Conception Vessel CV3), Kuan Yuan (CV4), and bilateral Tzu Liao (Urinary Bladder UB32).<sup>12</sup>

### **Muscle energy type 1 for tethered cord and sphenobasilar joint**

Another approach for tethered cord comes from Muscle Energy Technique (MET) developed by Osteopath Fred Mitchell and Integrative Manual Therapy developed by Sharon Weiselfish Giammatteo, PT and Thomas Giammatteo, DC.

Type 1’s are a Muscle Energy technique where the practitioner places their hands in two places and rotates the tissue between their hands in the direction of ease and then side bends the tissue in the opposite direction of the rotation.

For example, place one hand on the low back area under the client’s back as they lay on the table. Focus into the tissue to the level of the lumbar spinal cord, cauda equina, or sacral plexus. The other hand is on the lower abdominal or pelvic area. Focus the anterior hand on the front or anterior side of the spinal cord, cauda equina, and sacral plexus. Imagine you have a ball between your hands. The center of the ball is the area of tethering of the cord or the low back area.

Sometimes a tethered cord feels like cooked spaghetti that has been left in the pot over night with everything stuck together. What it should feel like is moist and flexible but not stuck together. It can feel like a hydrated flexible version of dry spaghetti in the box with each nerve fiber independently mobile but lined up next to each other. The meaning of the cauda equina at the end of the spinal cord is “horse’s tail,” with the nerve fibers free and separate like a horse’s tail.

Gently compress into the tissue with both hands. Look at the person’s body, rotation is moving the tissue towards the right or left side. Move your hands and the tissue in both directions. Which way feels easiest? Go in that direction. Right side bending is bringing the right shoulder towards the right hip. If rotation to the left was easiest, then do that and then side bend towards the right. Then see if you can rotate a little more to the left and side, bend a little more to the right.

Hold the tissue in those two directions until you feel the unwinding stop. Often you will feel the tissue between your hands moving, unwinding, or getting softer. Sometimes you will feel the tissue unwinding and getting more flexible farther away from your hands. Notice, with your hands on the low back and abdomen, what is happening at the head or at the feet. How far from your hands is there unwinding, movement, or changes? How is what you are doing affecting the person’s breathing, or how relaxed they are on the table?

This should be comfortable for the client but may feel strange as the body relaxes or as the fluid in the tissues starts to move more freely. At the other end of the spine is the sphenobasilar joint. It is a hinge joint where both the sphenoid bone and the occiput move upwards together and downwards together in the CRI.

To do a Muscle Energy Type 1 technique for the sphenobasilar joint, place your thumb and little finger on the sphenoid bone (at the temples on both sides. If your hand is too small you can do the right side and left side separately. Your second hand rests on the occiput or back part of the head with the client laying on their back as with the tethered cord technique. Rotate both hands together to the right and then to the left. Which way is easier? Rotate to the ease and then side bend in the opposite direction. For example, if rotating to the left is easiest, rotate to the left and side bend to the right. Both hands move together in the same directions.

Note that direction of rotation is determined by the direction of the anterior side of the body. Imagine you have a ball between your hands, one underneath, the other on top or anterior surface. When the top hand rotates to the right that is called right rotation, even though the back hand is moving to the left.

A third Type 1 technique can be done with one hand on the low back or sacrum and the other hand under the head on the occiput. Imagine a long bar between your hands. Together rotate your hands and the tissue of the head, back and spine to the right and left. Which direction is easiest? Go in that direction then side bend together to the opposite direction. For example if right rotation is easiest (rotating both hands so that the anterior surface of the body moves towards the right side), then side bend to the left (left ear gets closer to the left hip). Go a little farther in both directions and then hold until the unwinding stops or until it feels like the technique is complete. It may take a minute or so, or you may hold the “fulcrum” or technique for several minutes. Type 1 techniques can be done anywhere in the body for the purpose of allowing structures to separate and enjoy greater space.

### **Conclusion**

Although surgery for a Tethered Cord is the most common approach, there are a number of Complementary and alternative medicine (CAM) approaches that can successfully decrease pain and increase function. CAM approaches are frequently used by individuals with hypermobility conditions to help manage chronic pain, fatigue, and autonomic symptoms. Surveys and qualitative studies show that a substantial proportion of patients with hypermobile Ehlers–Danlos syndrome report using therapies such as acupuncture, manual

therapies, breathing practices, and other integrative approaches as adjuncts to conventional care.<sup>13</sup> These approaches are often aimed at improving neuromuscular stability, reducing pain, and supporting autonomic regulation. Integrative medicine models for hypermobility and related connective tissue disorders emphasize multimodal management strategies that include rehabilitation, self-management practices, and non-pharmacological therapies alongside conventional medical care (Frontiers in Medicine study; Integrative medicine for HSD/EDS review).<sup>13</sup> While evidence for many CAM modalities remains emerging, their widespread use highlights the need for continued research into integrative approaches for symptom management in hypermobility-related neurological conditions.

## Acknowledgements

None.

## Conflicts of interest

The authors declare that there are no conflicts of interest.

## References

- Severance S, Daylor V, Petrucci T, et al. Hypermobility Ehlers-Danlos syndrome and spontaneous CSF leaks: the connective tissue conundrum. *Front Neurol*. 2024;15:1452409.
- Weisbrod LJ, Thorell W. Tethered Cord Syndrome (TCS). In: *StatPearls*. StatPearls Publishing; 2023.
- Drake JM. Surgical management of the tethered spinal cord—walking the fine line. *Neurosurg Focus*. 2007;23(2):E4.
- Wang DJ, Rao H, Korczykowski M, et al. Cerebral blood flow changes associated with different meditation practices and perceived depth of meditation. *Psychiatry Res*. 2011;191(1):60–67.
- Kosslyn SM, Alpert NM, Thompson WL, et al. Visual mental imagery activates topographically organized visual cortex: PET investigations. *J Cogn Neurosci*. 1993;5(3):263–287.
- Di Pino G, Mioli A, Altamura C, et al. Embodying an artificial hand increases blood flow to the investigated limb. *Open Res Eur*. 2021;1:55.
- Rasmussen TR, Meulengracht KC. Direct measurement of the rhythmic motions of the human head identifies a third rhythm. *J Bodyw Mov Ther*. 2021;26:24–29.
- Qiu Z, Lin X, Ma L, et al. Acupuncture as an adjuvant therapy for tethered cord syndrome: a case report. *Med Acupunct*. 2025.
- Hara T, Ohara Y, Kondo A. Diagnosis and management of tethered cord syndrome. *Adv Tech Stand Neurosurg*. 2024;49:35–50.
- Kim SG, Park JH, Park HB, et al. Filum terminale lipoma with herniated intervertebral disc treated with traditional Korean medicine: a case report. *J Acupunct Res*. 2020;37(4):281–284.
- Ozaki D, Kimiwada T, Hayashi T, et al. Effect of early tethered cord release on urodynamic findings and lower urinary tract function in myelomeningocele patients. *J Neurosurg Pediatr*. 2025;35(2):137–143.
- Cheng PT, Wong MK, Chang PL. A therapeutic trial of acupuncture in neurogenic bladder of spinal cord injured patients—a preliminary report. *Spinal Cord*. 1998;36(7):476–480.
- Doyle TA, Halverson CME. Use of complementary and alternative medicine by patients with hypermobile Ehlers-Danlos Syndrome: a qualitative study. *Front Med (Lausanne)*. 2022;9:1056438.