



Case Report

Ayurvedic management in cervical spondylotic myelopathy

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ABSTRACT

The age related spondylotic changes may result in direct compressive and ischemic dysfunction of the spinal cord known as cervical spondylotic myelopathy (CSM). Symptoms often develop insidiously and are characterized by neck stiffness, unilateral or bilateral deep aching neck, arm and shoulder pain, and possibly stiffness or clumsiness while walking. The management available in current mainstream medicine is not satisfactory. Various Ayurvedic treatments have been in use for these manifestations. We present a case of CSM, which was treated with a combination of *Panchakarma* procedures and Ayurvedic oral drugs. The patient was considered suffering from *Greevastambha* (neck stiffness) and was treated with *Shalishastika pinda svedana* (sudation with medicated cooked bolus of rice) for one month and *Mustadi yapana basti* (enema with medicated milk) for 16 days along with oral Ayurvedic drugs such as *Brihatavata chintamani rasa* 50 mg, *Ekgangaveer ras*-250 mg, *Ardhangavatari rasa*-125 mg *Amrita satva* (dry extract of *Tinospora cordifolia* Willd)-500 mg, *Muktasukti pisti*-500 mg, *Ashwagandha churna* (powder of *Withania somnifera* Dunal)-500 mg *Dashmool kvatha ghana* (solid extract of *Dashmool kvatha*)-500 mg, *Trayodashanga guggulu*-575 mg, twice a day with honey and *Eranda paka*-10 g twice a day with milk. Patient's condition which was assessed for symptoms of CSM and Chile's modified Japanese Orthopaedic Association (mJOA) score for cervical spondylotic myelopathy showed substantial improvement. This study shows that the cases of CSM may be successfully managed with Ayurvedic treatment.

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1. Introduction

A degenerative cascade due to age-related changes in the spinal column is known as spondylosis. These spondylotic changes may result in direct compressive and ischemic dysfunction of the spinal cord known as cervical spondylotic myelopathy (CSM) [1]. Symptoms often develop insidiously and are characterized by neck stiffness, unilateral or bilateral deep, aching neck, arm and shoulder pain; and possibly stiffness or clumsiness while walking. The hallmark symptom of CSM is weakness or stiffness in the arms. Clumsiness or weakness of the hands in conjunction with the legs is also characteristic of CSM. The incidence of CSM-caused hospitalization in eastern Asia is 4.04 per 100,000 person-years, with higher incidences observed in older and male patients [2]. The incidence of Ossification of the Posterior Longitudinal Ligament [OPLL], a common cause of cervical spondylotic myelopathy is 2.4%

in the Asian population, and 0.16% in the non-Asian population [3]. The overall prevalence in Indian population is unknown. The pathophysiology of CSM is thought to be multifactorial. Both static factors causing stenosis and dynamic factors resulting in repetitive injury to the spinal cord and spinal cord ischemia are involved in pathophysiology.

Only limited conservative and surgical procedures are available in modern medicine for disease but there is much limitation to use these procedures. The standard treatment for moderate to severe CSM is operative procedures which are least preferred by the elderly patients. Hence there is a need to search for effective treatment in alternative medicine. No study is published in PubMed for Ayurvedic approach on CSM till date. Here we represent a case of CSM which was successfully treated with Ayurvedic management with *Greevastambha* (neck stiffness) as the Ayurvedic diagnosis [4].

2. Case report

A 62 years old male patient was consulted in Out-Patient Department of National Institute of Ayurveda, Jaipur for

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complaint of gradually progressive weakness of both upper and lower limbs. Patient also had the complaint of giddiness, neck stiffness and pain around the neck region. Patient had suffered from these problems since 4 years. Symptoms were aggravated by prolonged sitting and standing and minimally eased with gentle movement. The patient also reported intermittent low back pain to varying degrees over the past 2 years which radiated to bilateral lower limbs and intermittent numbness and tingling in the posterior calf region. The patient had undergone neurologic and orthopedic consultations in a tertiary care hospital of Jaipur a year before and conservative and surgical management was recommended. He didn't have complaints of any bowel or bladder changes. The medical history was unremarkable, and his general health was good. He was not taking any medications at the time of consultation.

3. Clinical findings

The case was subsequently admitted to the male *Panchakarma* ward of National Institute of Ayurveda, Jaipur on March-10, 2016 for the administration of therapeutic procedures. On physical examination, patient was anxious, appetite was apparently normal and tongue was uncoated. Micturition and bowel movement were normal. Patient had *Vatapitta prakriti* with *Madhyam samhanana* (medium body built), *Madhyam sara* (medium purest body tissue), *Sama pramana* (symmetrical body proportion), *Madhyam satmya* (medium homologation), *Madhyam satva* (medium mental strength), *Madhyam vyayamshakti* (medium capability of physical activities), *Madhyam Aharshakti* and *Jaranshakti* (medium food intake and digestive power). The patient demonstrated normal gait. The active movements of lumbar spine were within functional limits with reported pain at the end of forward flexion. Straight leg raise (S.L.R.) was negative bilaterally. Tenderness was noted over the spinous processes of L4 and L5. The range of motion for the bilateral knee and ankle joints was normal and the strength of the hamstrings and quadriceps musculature was also normal. On neurological examination, higher mental function and speech were normal. All cranial nerves were normal. On motor examination, bulk, tone, power and coordination of arms and legs were normal bilaterally. Power in both upper limbs was grade 4 on medical research council score. Power in left leg was grade 4+ and in right leg was grade 5. Hyperreflexia was found in upper extremities bilaterally. Hoffman reflex and Babinski reflex were positive bilaterally. A multidermatomal decrease of sensation in bilateral upper extremities during pinprick testing was revealed during examination. Lhermitte's sign was positive. Deep tendon reflex examination revealed a diminished left Achilles tendon reflex. Joint position sense and vibration sensation was normal bilaterally. All laboratory and biochemical investigations were normal. Magnetic resonance imaging (MRI) of cervical spine that was done on March 2, 2016 revealed diffuse desiccated disc bulging at C3-4, C4-5, C5-6 and C6-7 level causing indentation over ventral thecal sac with associated ligamentum flavum hypertrophy causing spinal canal narrowing and spinal cord compression at multiple levels most notably at C-3-4 level with thinning of spinal cord at this level with T2 and STIR hyper intensity cord edema-suggestive of compressive myelopathy.

4. Diagnostic focus and assessment

The patient was a known case of cervical spondylotic myelopathy. It was confirmed by previously done MRI. The condition was also associated with lumbar spondylosis. *Greevastambha* was considered as Ayurvedic diagnosis which is included in *Nanatamaj Vatavyadhi* (~neurological, rheumatic and musculoskeletal diseases). Amyotrophic lateral sclerosis (ALS), primary spinal cord tumors,

syringomyelia, extramedullary conditions (e.g., metastatic tumors), sub acute combined degeneration of the spinal cord (vitamin B₁₂ deficiency), hereditary spastic paraplegia, normal pressure hydrocephalus and spinal cord infarction were the differential diagnosis for the case. The presence of extremity sensory abnormalities and the absence of fasciculation on examination in this case excluded the diagnosis of ALS. Other conditions were excluded on the basis of characteristic MRI findings. In cervical spondylotic myelopathy, MRI shows narrowing of the spinal canal caused by osteophytes, herniated discs and ligamentum flavum hypertrophy [5].

5. Treatment plan

As no specific line of treatment is described for *Greevastambha* in Ayurvedic texts, general line of management of *Vatavyadhi* such as *Abhyanga* (massage), *Svedana* (sudation), *Mridu virechana* (mild purgation) and *Basti* procedures were adopted for the patient [6]. Considering the patient's *Vatapitta prakriti* and physical constitution, mild massage and mild sudation in the form of *Shalishastika pinda svedana* and *Mridu basti* (a milder form of Basti) in the form of *Mustadi yapana basti* were given to the patient.

6. Intervention

Various *Panchakarma* interventions were adopted to treat this patient. *Mridu virechana* with castor oil in dose of 20 ml with lukewarm milk was given at night prior to the beginning of medical intervention to the patient. From next day *Shalishastika pinda svedana* for 30 days along with *Mustadi yapana basti* for 16 days were adopted [Table 1]. Along with these *Panchakarma* interventions, selected Ayurvedic oral medicine-*Brihatavata chintamani rasa* 50 mg, *Ekanagaveera rasa*-250 mg, *Ardhangavatari rasa*-125 mg *Amrita satva* (starch of *Tinospora cordifolia* Willd)-500 mg, *Muktasukti pisti*-500 mg, *Aswagandha churna* (powder of *Withania somnifera* Dunal)-500 mg *Dashmool kvatha ghana* (solid extract of *Dashmool kvatha*)-500 mg and *Trayodashanga guggulu*-575 mg (The said combinations prescribed in a single dose of 3 g with proprietary name-Aghat™) administered with honey twice a day and *Eranda paka*-10 g twice a day with milk.[Table 2] These oral medicines were continued for next 2 months.

7. Outcome measures and follow up

After completion of *Panchakarma* procedures patient condition was assessed for pain, giddiness, neck stiffness, neck motion, power and reflexes of upper and lower limbs. Pain had subsided. Patient had no giddiness. Neck stiffness had substantially reduced. Range of motion of neck was normal. Power of both upper and lower limbs was 5/5 on medical research council scale. Reflexes of both upper and lower limbs were 2+. Bilateral straight leg rising test had increased to 90° for hip flexion. Bilateral Hoffman reflex, bilateral Babinski reflex and Lhermitte's sign was negative at this time. mJOA score for cervical spondylotic myelopathy was-08 before treatment and improved to 14 after one month of treatment [7]. Patient was discharged on April 12, 2016 with instruction to continue oral medicines. Patient condition was stable after one month of treatment but patient felt some stiffness in lumbar region. MRI done on May 31, 2016 revealed concentric desiccated diffuse disc bulge seen at C3-4 to C6-7 levels with postero-lateral disc protrusion causing central canal and bilateral neural foraminal narrowing resulting mild compression over bilateral exiting nerve roots (Table 3). There was a remarkable improvement in MRI as ligamentum flavum hypertrophy causing spinal canal narrowing and spinal cord compression at multiple levels most notably at C-3-4 level with thinning of spinal cord at this level with cord edema were not

Table 1
Panchakarma procedures for the case of cervical spondylotic myelopathy.

Panchakarma procedures	Method of preparation	Method of application	Days of treatment
<i>Shalishastika Pinda Svedana</i>	300 g of <i>Shashtika shali</i> is cooked with 1.5 L of milk and decoction of <i>Bala moola</i> (root of <i>Sidaretusa L.</i>). This mixture was kept in four pieces of cloth to make 4 boluses. Another portion of milk and decoction of the same quantity was mixed and heated in low temperature to dip the above boluses for warming the Pottali.	Massage with <i>Asvagandha</i> oil was done on whole body for 15 min followed by whole body massage for 45 min with the help of a cotton bag filled with bolus of processed rice.	30 days
<i>Mustadi Yapana Basti</i>	<i>Saindhava</i> salt 5 g, honey 25 g, <i>Ashwagandha</i> oil 50 ml, <i>Panchatikta Ghrita</i> 25 ml and milk processed with <i>Mustadi yapana basti kwatha</i> drugs 300 ml. Powdered rock-salt was added to honey and stirred. Then oil and <i>ghrita</i> was added to this mixture and again stirred. Then paste of <i>Satahva</i> (<i>Anethum sowa</i> Kurz) followed by decoction was added and mixed properly. 50 ml soup of goat femur bone marrow was added in this emulsion and then mixed properly to make homogenous emulsion. This emulsion was heated gently in a water bath.	Given before meal with <i>basti yantra</i> .	Total 16 basti was given daily. No separate <i>Anuvasan basti</i> was given as no separate <i>Anuvasan basti</i> is needed for <i>Yapana basti</i> .

Table 2
Ayurvedic treatment for cervical spondylotic myelopathy.

Name of the drug used orally	Composition	Dose	Anupana	Days of treatment
<i>Eranda paka</i>		10 gm twice a day	Milk	From 1st day to July 2016
<i>Triyodashanga guggulu</i>		575 mg twice a day	Honey	From 1st day to July 2016
<i>Brihatavata chintamani rasa</i>	<i>Swarna, Raupya, Abhraka, Moti, Praval, Lauha, Parad, Gandhak</i>	50 mg twice a day	Honey	From 1st day to July 2016
<i>Ardhangavatari rasa</i>	<i>Parad, Tamra, Gandhak, Trikatu, Jambir</i>	125 mg twice a day	Honey	From 1st day to July 2016
<i>Ekgaveera rasa</i>	<i>Parad, Tamra, Gandhak, Vanga bhasm, Lauha, Naga bhasm</i>	250 mg twice a day	Honey	From 1st day to July 2016
<i>Dashamula kvatha ghana</i>	Solid extract of decoction of roots of 10 herbs	500 mg twice a day	Honey	From 1st day to July 2016
<i>Ashwagandha churna</i>		500 mg twice a day	Honey	From 1st day to July 2016
<i>Amrita satva</i>		500 mg twice a day	Honey	From 1st day to July 2016

Table 3
Timeline.

Year	Incidence/intervention
2012	Patient experienced pain around neck, giddiness and gradual weakness of upper limbs
2014	Patient felt lower backache and tingling sensation in lower limbs
2015	Patient was consulted in orthopedic and neurology department of tertiary care hospital for these problems. Patient was advised conservative treatment.
March-2016	Patient revisited neurology hospital as these problems were aggravated. A MRI was advised to the patient. MRI that was conducted on March 2, 2016 revealed-diffuse desiccated disc bulging at C3-4, C4-5, C5-6 and C6-7 level causing indentation over ventral thecal sac with associated ligamentum flavum hypertrophy causing spinal canal narrowing and spinal cord compression at multiple levels most notably at C-3-4 level with thinning of spinal cord at this level with T2 and STIR hyper intensity cord edema-suggestive of compressive myelopathy. The patient was advised for spinal surgery.
10/03/2016	Patient was unwilling for surgery. Patient visited O.P.D. of National Institute of Ayurveda Jaipur for these problems and was admitted in male Panchakarma ward for administration of Panchakarma Procedures. Castor oil in the dose of 20 ml with milk was given at night.
11/03/2016–12/04/2016	- <i>Shalishastika pinda svedana</i> was done for 30 days along with <i>Mustadi Yapana Basti</i> for 16 days. Selected Ayurvedic oral drugs- <i>Brihatavata chintamani rasa, Ekgaveera rasa, Ardhangavatari rasa, Amrita satva, Muktasukti pisti, Aswagandha churna, Dashmool kvatha ghana, Trayodashanga guggulu</i> and <i>Eranda paka</i> twice a day were prescribed along with these Panchakarma procedures. mJOA score for spondylotic myelopathy was-08 at the time of admission and its changed to 14 after completion of Panchakarma procedures. There was clinical improvement in patient condition after one month of therapy
12/04/2016	Patient was discharged. Same oral medication is continued to till date.
31/05/2016	MRI done on dated May 31, 2016 revealed concentric desiccated diffuse disc bulge seen at C3-4 to C6-7 levels with postero-lateral disc protrusion causing central canal and bilateral neural foraminal narrowing resulting mild compression over bilateral exiting nerve roots. There was no evidence of compressive myelopathy.

notable in this MRI as compared to previous MRI on March 2, 2016 where all these were present. Serum glutamic oxaloacetic transaminase (SGOT), Serum glutamic pyruvic transaminase (SGPT), bilirubin (direct and indirect) and serum creatinine that was tested on June 11, 2016 for assessment of safety profile of treatment were also within limit.

8. Discussion

The three main pathophysiologic factors in the development of CSM are static mechanical compression, dynamic mechanical

compression and spinal cord ischemia [8]. Static mechanical factors result in the reduction of spinal canal diameter and spinal cord compression. With aging, the intervertebral discs dry out resulting in the loss of disc height which puts greater stress on the articular cartilage of the vertebrae and their respective end plates. Osteophytic spurs that are developed at the margins of these end plates stabilizes adjacent vertebrae whose hyper mobility is caused by the degeneration of the disc. The calcified disc further stabilizes the vertebrae. The ligamentum flavum may also stiffen and buckle into the spinal cord dorsally. These causes direct compression of the spinal cord resulting in myelopathy. The normal motion of the

cervical spine may aggravate spinal cord damage precipitated by this direct mechanical and static mechanical compression. The spinal cord lengthens during flexion, thus stretching over ventral osteophytic ridges. The ligamentum flavum may buckle into the spinal cord during extension, causing a reduction of available space for the spinal cord [9].

Ayurveda diagnosis of these problems can be correlated with *Greevastambha*, *Bhrama* (vertigo) and *Bahushosha* (weakness and emaciation of upper limbs). All these symptoms are considered in *Nanatamaj Vatavyadhi* (disorders only due to *Vata dosha*). *Vata* is vitiated due to several etiological factors, *Margavarana* (obstruction in natural course of *Vata* such as normal distribution, synthesis of tissues elements etc.) and *Dhatukshaya* (~depletion of body tissue). This vitiated *Vata* leads to *Margavarana* and *Dhatukshaya* in vicious cycle and may lead to manifestation of CSM [10]. There is depletion of *Sthanik Kapha* (localized *Kapha dosha* at cervical region) due to vitiated *Vata dosha*. Vitiating *Pitta* and *Vata doshas* lead to *Bhrama*. Vitiating *Vata* and depleted *Kapha dosha* may lead to *Bahushosha*. All the pathology of CSM is included in these major groups of Ayurvedic *Samprapti* (pathology). *Brihmana* (~nourishment) is the treatment for *Dhatukshaya*. *Snigdha* (unctuous), *Srotosodhaka* (bio-purification of micro-channels) *Vatanulomaka* (~correction of function of *Vata dosha*) treatment and treatment which is compatible to *Kapha* and *Pitta doshas* should be adopted for any *Avarana* or *Margavarodha*. *Yapana basti*, *Guggulu*; *Shilajeeta* (black bitumen) and *Rasayana* (immunomodulator) are also indicated for *Nanatamaj vata*, *Avrita vata* and chronic *Vata vyadhi* [11].

Panchakarma procedures and selected Ayurvedic oral drugs were employed according to all above said facts to manage this case of CSM. In Ayurveda, brain and spinal cord is considered to be form of *Majjadhara kala* (~membrane surrounding the bone marrow) [12] *Bhrama*, *Tamahapravesha* (temporary vision loss) are also the symptoms of *Majja-pradoshaj vikaras*.

Foods and drugs having sweet and bitter properties are indicated in *Majja-pradoshaj vikaras*. *Tikta rasa* (bitter taste substances) is indicated for bone pathology [13]. *Mustadi yapana basti* is indicated for increasing vigour, strength and semen. It is useful in *Katishoola* (backache), pain in thigh and calf region, headache and *Vatarakta* (various diseases of rheumatic spectrum). It also has *Rasayana* property. It can break pathogenesis of *Vata vyadhi* by removing *Margavarodha* by purification of channels and *Dhatukshaya* by its *Brihmana* property. Most of *Majja* and *Asthi pradoshaj vikara* (disorders of bone and bone marrow) can be managed with *Mustadi yapana basti* [14]. There were minor changes made in preparation of *Mustadi yapana basti*. *Majja* (bone marrow of goat) was used instead of *Mamsa rasa* (meat soup) for the preparation of *Basti* [15]. *Majja* used in *Basti* may impart improvement in *Majja-pradoshaj vikaras*. *Shalishastika Pinda Svedana* has the *Brihmana* (~provides nourishment to muscles and bones) effect. *Ashwagandha* has *Rasayana* and *Balya* (anabolic) properties [16]. *Triyodashanga Guggulu* is useful in *Snayugatavata* (~various tendon and ligament disorders), *Khanjavata* (limping disorders), *Asthigatavata* (disorders of bone), *Majjagatavata* (disorders of bone-marrow), and various *Vatic* disorders (~neurological, rheumatic and musculoskeletal diseases) [17]. *Dashamula kvatha* is having *Tridoshaghana* (alleviating deranged *doshas*) property and is useful in all types of *Vataja* and respiratory disorders [18]. *Amrita* have *Balya* (anabolic) and *Rasayana* (immunomodulator) properties and treated depletion of tissues [19]. *Muktasukti pisti* is helpful as supplement of calcium for bones [20]. *Erandapaka* is indicated in *Vata vyadhi*, *Pakshavadha* (paralysis of one part of body), *Shoola* (abdominal colic), *Vibandha* (constipation) etc. [21] *Ekangaveer rasa* is effective in *Vatakapahaj disorders* and *Pakshaghata* (hemiplegia) [22]. *Ardhangavatari rasa* is helpful in *Pakshaghat* and *Vatika* disorders [23].

Various non-surgical strategies have been in use such as cervical traction, cervical immobilization (collar or neck brace), skull traction and physical therapy. A study demonstrates the benefits of cervical immobilization, while other study shows that immobilization does not improve the patient's condition [24]. In the case of myelopathy, surgical intervention is necessary. The cervical laminectomy is not appropriate for all patients. It may lead to neurologic deterioration and attributed to a development of latent instability of the spine with development of kyphotic spinal deformities [25]. SGOT, SGPT and serum creatinine that was investigated after treatment were within normal limit. This demonstrates the safety profile of multi-ingredient formulation and *Panchakarma* procedures. Hence this case study is important one as this shows the clinical and radiological improvement in cervical compressive myelopathy with *Panchakarma* and Ayurvedic medicinal interventions. There was no need to use any surgical intervention for this case.

9. Conclusion

The case report demonstrates clinical and radiological improvement in a cervical spondylotic myelopathy with *Panchakarma* and Ayurvedic medicinal interventions.

10. Patient consent

Written permission for publication of this case study had been obtained from the patient.

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