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AYURVEDIC MANAGEMENT OF NON-COMPRESSIVE MYELOPATHY: A CASE REPORT

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Abstract:

Background: Non-compressive myelopathy is a neurological disorder characterized by spinal cord dysfunction in the absence of a significant mechanical compressive lesion. Management can be challenging, particularly when neurological recovery is limited with conventional approaches. **Case Report:** A 61-year-old male presented with progressive bilateral lower-limb weakness, sensory disturbances, gait impairment, and urinary and bowel symptoms. MRI revealed spinal cord abnormalities without significant compression, supporting a diagnosis of non-compressive myelopathy. Neurological examination revealed bilateral lower-limb weakness, more pronounced proximally, with impaired muscle power and altered deep tendon reflexes. From an Ayurvedic perspective, the condition was assessed as predominantly *Vata-Kaphaja Gridhrasi* with involvement of *Majja* and *Snayu*. An individualized Ayurvedic treatment protocol was administered for 14 days, consisting of internal medications and external therapies, including *Abhyanga*, *Swedana*, and *Basti*. **Results:** Following treatment, improvement was observed in lower-limb motor function, neurological status, and functional ability. **Conclusion:** This case highlights the potential role of an individualized Ayurvedic approach as an adjunctive strategy in the management of non-compressive myelopathy. Further clinical studies are warranted to evaluate its therapeutic efficacy and underlying mechanisms.

IndexTerms **- Non-compressive myelopathy, *Vata-Kaphaja Gridhrasi*, Neurological disorder, *Basti*, Ayurvedic management.**

I. INTRODUCTION

Myelopathy refers to dysfunction of the spinal cord resulting from various pathological processes, including mechanical compression, inflammatory disorders, vascular insults, nutritional deficiencies, infections, neoplasms, and other metabolic or degenerative conditions[1]. Non-compressive myelopathy represents a heterogeneous group of spinal cord disorders in which neurological dysfunction occurs without significant structural compression of the spinal cord[1]. The three principal functional domains affected are motor, sensory, and autonomic functions, with autonomic dysfunction particularly involving bowel, bladder, and erectile function[2]. Early identification of the underlying pathology is important because some causes are potentially reversible, whereas others may result in permanent neurological disability.

From an Ayurvedic perspective, neurological manifestations such as weakness, altered sensation, restricted movement, gait disturbance, pain, and impairment of neurological functions may be considered predominantly under disorders involving *Vata Dosha*, particularly when *Snayu*, *Majja*, and related *Srotas* are affected[3,4]. Depending upon the clinical presentation, conditions such as *Vata Vyadhi*, *Gridhrasi*, *Vata Vyadhi*, *Sarvanga Vata*, and other disorders involving *Majja Dhatu* may be considered in the differential assessment[3,5].

The present case describes the clinical assessment and Ayurvedic management of a patient diagnosed with non-compressive myelopathy, with emphasis on the correlation between the modern neurological diagnosis and the Ayurvedic assessment and treatment approach.

II. MATERIALS AND METHODS

The present report is a single-patient clinical case report documenting the Ayurvedic assessment and management of a patient with non-compressive myelopathy. The patient's clinical history, neurological findings, investigations, Ayurvedic assessment, treatment protocol, and subsequent clinical observations were documented through detailed case taking and systematic clinical evaluation**.**

III. CASE REPORT

3.1 Patient Information

A 61-year-old male, a retired ex-service employee and a known case of Diabetes mellitus and Hypertension, both on regular treatment for several years, presented with a three-month history of progressively worsening weakness and numbness of both lower limbs and was subsequently evaluated at the Department of Kayachikitsa. The symptoms initially manifested as gradually progressive motor weakness, more pronounced on the left lower limb, characterized by dragging of the left foot, recurrent slipping of footwear, and a tendency to fall. Five weeks after the onset of weakness, he developed numbness involving the toes, perineal region, and lower abdomen, which gradually progressed and was associated with increasing difficulty in moving the left lower limb. Subsequently, he developed urinary urgency and constipation, with progressive sensory impairment and deterioration in functional mobility. He was initially evaluated at a local hospital, where contrast-enhanced MRI of the dorsal spine reportedly demonstrated patchy spinal cord enhancement at the T10–T11 level, with mild adjacent leptomeningeal enhancement extending from T9 to T11 and subtle serpiginous leptomeningeal structures along the dorsal aspect. However, no significant compressive lesion was identified that could adequately account for the neurological deficits. The patient received conventional treatment, including intravenous methylprednisolone for five days, deep-vein thrombosis prophylaxis, and subsequent physiotherapy focusing on mobilization and gait training. Despite these interventions, his neurological deficits continued to progress, with worsening bilateral lower-limb weakness ultimately resulting in inability to walk. He subsequently developed increasing numbness and tingling in both lower limbs extending up to the umbilical level, along with constipation, urinary retention, and loss of perianal sensation. In view of the progressive neurological deficits despite conventional treatment, he sought Ayurvedic management.

3.2 General Examination

The patient was conscious and oriented and appeared reasonably well nourished. The recorded general examination was broadly unremarkable, with no significant abnormality noted in the cardiovascular, respiratory, abdominal, or peripheral examination apart from the neurological deficits.

- Pulse: 82/min
- Respiratory rate:16/min
- Temperature: 98.6°F
- Blood pressure: 140/70 mmHg
- No significant cyanosis or lymphadenopathy documented
- No significant peripheral edema documented

3.3 Neurological Examination

- General/mental status: Conscious, oriented, and cooperative.
- Speech: Normal
- Higher mental functions were grossly intact.
- Cranial nerves Examination: No significant abnormalities.
- Motor Examination:
  Bilateral spastic paraparesis with associated wasting of the lower limbs. Spasticity was present in both lower limbs, with significant weakness and impaired functional mobility.

Muscle power in the upper limbs was essentially preserved. Lower-limb examination revealed significant weakness, particularly involving hip and knee movements. The documented muscle power was approximately:

Table 1: Motor Power Assessment

Movement	**Muscle power**
Shoulder movements	5/5 Bilaterally
Elbow movements	5/5 Bilaterally
Wrist movements	5/5 Bilaterally
Hand grip	Normal
Hip movements	2/5 Bilaterally
Knee flexion	3/5 Bilaterally
Ankle dorsiflexion	3/5 Bilaterally
Plantar flexion	4/5 Bilaterally

❖ Reflexes

Deep tendon reflexes were recorded as increased in the lower limbs, with 2+ in the upper limbs and 3+ in the knee/ankle reflexes bilaterally.

- Babinski sign: Positive bilaterally (bilateral extensor plantar response)
- Clonus: Ankle clonus likely present bilaterally
- Hoffmann's sign: Likely negative bilaterally

❖ Sensory Examination

- Impaired perception of light touch, pinprick, and temperature (hot and cold) over both lower limbs upto the umbilical level.
- Vibration sense was impaired up to the level of the anterior superior iliac spine.
- proprioception was absent at the toes bilaterally.
- Sensory perception over both upper limbs was preserved, with no significant sensory deficit noted.

❖ Autonomic Examination

- Urinary retention and constipation.
- Impaired perianal sensation.
- No other significant autonomic disturbances were noted.

❖ Gait and Functional Assessment

Unable to ambulate independently due to severe bilateral lower-limb weakness and spasticity.

❖ Special test

- Straight leg raising test: positive bilaterally right 15˚ and left 15˚
- Faber’s test: negative bilaterally.

3.4 Investigations

MRI of the Dorsal spine with contrast was performed during the initial evaluation.

- Patchy spinal cord enhancement at the T10–T11 level
- Changes around approximately T9–T11
- Mild adjacent leptomeningeal enhancement
- Subtle spinal/meningeal changes
- No significant vertebral body abnormality
- No definite major spinal cord compression

Laboratory investigations

- C-reactive protein (CRP): 17.57 mg/L
- HbA1c: 7.5%
- Vitamin B12: 685.2 pg/mL
- MCV: 77.1 fL
- MCH: 25.4 pg
- RDW: 14.8%
- CSF glucose: 90.1 mg/dL
- CSF protein: 45 mg/dL
- CSF cell count: No cells detected
- CSF cytology: No malignant cells
- GFAP-IgG antibody in CSF: Negative

The Ayurvedic assessment was performed using *Dashavidha Pariksha*, and *Srotas Pariksha*. The recorded findings suggested predominance of *Vata Dosha*, with associated *Kapha Dosha* involvement.

3.5 Diagnosis

Based on the clinical presentation and Ayurvedic assessment, the condition was provisionally diagnosed as *Vata-Kaphaja Gridhrasi* from an Ayurvedic perspective, corresponding to Non-compressive myelopathy in modern medicine.

3.6 Therapeutic Measures

Table 2: Therapeutic Measures and Clinical Response

Internal medicines with dose	*Kriyakrama /Shodhana krama*	Remarks
1. *Maharasnadi Kashayam* (oral) 50ml-0-50ml (B/F) 2. *Shaddharanam Choornam* 0-0-1tsp at bed time with warm water (oral)	1. *Dhanyamladhara* (*Adhakayam*) ×1 day 2. *Dasamoola Ksheera dhara* (*Sarvangam*) ×2 days	Mild reduction in heaviness and stiffness of the body was observed.
1. *Maharasnadi Kashayam* (oral) 50ml-0-50ml (B/F) 2. Tab *Yogaraja Guggulu* (oral) 1-0-1 (B/F) with warm water	1. *Abhyangam* (*Sarvangam*) with *Mahanarayana tailam* ×3 days 2. *Anuvasana Basti* with *Sahacharadi Sevyam* (75ml) ×2 days	Mild gradual improvement in lower-limb strength and mobility was observed, particularly in the ability to raise the leg
1. *Maharasnadi Kashayam* (oral) 50ml-0-50ml (B/F) 2. Tab *Yogaraja Guggulu* (oral) 1-0-1 (B/F) with warm water	1. *Kayasekam* (*Sarvangam*) with *Mahanarayana tailam* ×3 days 2. *Shashtika Shali pinda Swedam (Sarvangam)*with *Mahanarayana tailam* ×5 days	Gradual improvement in lower-limb muscle strength and mobility was observed, with improved ability to raise the legs. Bladder and bowel functions also showed gradual improvement, with reduction in urinary retention and constipation.

3. *Bala arkam* (oral) 20ml-0-20ml (B/F) with *Kashayam.*	3. *Lepam with Shashtika Shali* boiled in Milk (*Adhakayam*) ×5 days 4. *Rajayapana Basti* ×3 days With • *Mustadi Ksheera Kashayam*:700ml • *Mamsa Rasa*:150ml • *Sukumara Ghritam*:100ml • *Madhu*: 100ml • *ShataPushpa Kalka*:30g • *Saindhava Lavana*:15g 5. *Anuvasana Basti* with *Sahacharadi sevyam* (75ml) ×3 days ❖ (*Rajayapana Basti* and *Anuvasana Basti* was done alternatively)	

IV. RESULTS

The patient was monitored clinically throughout the treatment period.

The principal parameters assessed included:

Parameter		**Before treatment**	**After treatment**
Lower limb muscle power	Right	Hip 2/5, knee 3/5, Ankle dorsiflexion 3/5, Plantar flexion 3/5	Hip 2/5, knee 3/5, Ankle dorsiflexion 4/5, Plantar flexion 4/5
	Left	Hip 2/5, knee 3/5, Ankle dorsiflexion 3/5, Plantar flexion 3/5	Hip 2/5, knee 4/5, Ankle dorsiflexion 4/5, Plantar flexion 4/5
Deep tendon reflexes	Right	3+ in the knee/ankle	3+ in the knee/ankle
	Left	3+ in the knee/ankle	3+ in the knee/ankle
Babinski sign	Right	Positive	Positive
	Left	Positive	Negative
Sensory level (Lower limb, lower abdomen)	Right	Impaired light touch, pinprick, and temperature	Impaired light touch, pinprick,and temperature
	Left	Impaired light touch, pinprick, and temperature	Impaired light touch, pinprick,and temperature
Bladder/Bowel function	Urinary retention	+ Constipation	Urinary retention and Constipation mildly relieved
Straight leg raising test	Right	Positive (15˚)	Positive (20˚)
	Left	Positive (15˚)	Positive (25˚)

Following the 14-day Ayurvedic intervention, mild improvement in lower-limb muscle strength and functional mobility was observed. Straight Leg Raising (SLR) improved to 20° on the right and 25° on the left compared with the baseline assessment. Mild improvement was also noted in the previously impaired lower-limb movements, with slight enhancement in voluntary motor function and ambulation. Overall, the patient demonstrated modest improvement in lower-limb motor function and functional status during the short treatment period.

V. DISCUSSION

Non-compressive myelopathy encompasses a broad spectrum of disorders affecting the spinal cord in the absence of a significant mechanical compressive lesion. In the present case, the clinical presentation was characterized by progressive bilateral lower-limb weakness, sensory disturbances, gait impairment, and bladder and bowel dysfunction. The absence of a significant compressive lesion on MRI, despite the presence of neurological deficits, supported the diagnosis of non-compressive myelopathy. The progressive course of motor and sensory impairment, along with the development of autonomic dysfunction, indicated clinically significant spinal cord involvement.

From an Ayurvedic perspective, the presenting manifestations may predominantly be understood in the context of *Vata Dosha Dushti*, with possible involvement of *Avarana* contributing to the impairment of normal neuromuscular functions. *Vata* governs movement, neuromuscular coordination, sensory and motor activities, and other physiological functions related to the nervous system. Aggravated *Vata*, particularly when involving *Snayu*, *Majja*, and associated *Srotas*, may manifest as weakness, altered sensation, impaired movement, and functional disturbances. Accordingly, the internal medicines were selected with the therapeutic objectives of *Vata Shamana*, *Srotoshodhana*, *Shothahara*, and *Brimhana*.

5.1 Discussion on probable mode of action of internal medicnes

- *Maharasnadi Kashaya* was administered throughout the treatment period for its *Vata-shamaka* and *Shothahara* properties; constituents such as *Rasna, Guduchi, Ashwagandha, and Shunthi* have demonstrated anti-inflammatory and antioxidant activities that may have contributed to supporting neuromuscular function[6].
- *Shaddharana Choorna* was administered for its *Deepana*, *Pachana*, and *Vatanulomana* properties, with the intended effects of *Agnideepana*, *Amapacana*, *Vatanulomana* and *Srotoshodhana*[7]**.**
- *Yogaraja Guggulu* was administered for its *Vata-Kaphahara, Deepana-Pachana, Vatanulomana*, and *Shothahara* properties, which may have contributed to reducing stiffness and inflammation and supporting neuromuscular function[8].
- *Bala Arka* was administered as an adjunctive *Balya* and *Brimhana* therapy, with its *Mamsa* and *Majja Dhatu poshaka* properties potentially supporting neuromuscular strength and functional recovery[9].

5.2 Discussion on probable mode of action of *Kriyakarma*

The *Kriyakarma* protocol was progressively modified according to the clinical status of the patient and included *Dhanyamla Dhara, Dashamoola Ksheera Dhara, Sarvanga Abhyanga, Swedana*, and *Basti*.

- *Dhanyamla Dhara* was initially administered to address *Kapha Pradana Lakshanas* such as *Gaurava* and *Stambha*, along with impaired *Cheshta*, reflecting the overall *Vata-Kapha* predominance. Its *Ushna* and *Vatanulomana* properties were intended to alleviate stiffness, facilitate *Srotoshodhana*, and support improvement in restricted functional movements[10].

- *Dashamoola Ksheera Dhara* was incorporated as a *Vata-shamaka* and *Brimhana* therapy to address the *Vata Pradana Lakshanas*, particularly *Stambha* and functional impairment. *Dashamoola*, with its *Vata-Shamaka* and *Shothahara* properties, along with the *Snigdha* and *Brimhana* attributes of *Ksheera*, was intended to alleviate stiffness and discomfort while providing a nourishing and strengthening effect to the affected *Dhatus* and neuromuscular structures[11].

- *Sarvanga Abhyanga with Mahanarayana Taila* was employed as an important *Bahya Snehana* intervention to address *Vata Pradana Lakshanas*, particularly *Rukshata*, *Stambha*, muscular discomfort, and impaired mobility. *Mahanarayana Taila*, possessing *Vata-shamaka* and *Balya* properties, was used to provide *Snehana*, alleviate *Rukshata* and *Stambha*, and support muscular strength and flexibility. The combined therapeutic effects of *Abhyanga* and *Ushna* may promote local circulation, reduce muscular stiffness, and facilitate neuromuscular relaxation, thereby supporting subsequent mobilization[12,13].

- *Kayaseka with Mahanarayana Tailam* was employed primarily for its *Vata-shamaka*, *Snehana*, and *Balya* effects. The continuous pouring of warm medicated oil over the affected lower limbs may have helped to alleviate *Rukshata* and *Stambha*, improve tissue flexibility, and promote relaxation of the affected musculature. The *Vata-shamaka* and *Balya* properties of *Mahanarayana Tailam* may have further supported neuromuscular function and facilitated subsequent mobilization of the lower limbs[14,13].

- *Shashtika Shali Pinda Swedam* with *Mahanarayana Tailam* provided a combined *Brimhana*, *Balya*, *Snehana*, and *Swedana* effect, which was particularly relevant to the lower-limb *Daurbalya* and *Stambha* observed in this case. The nourishing properties of *Shashtika Shali* processed with *Ksheera*, together with the *Vata-shamaka* action of *Mahanarayana Tailam*, may have supported nourishment and strengthening of *Mamsa* and *Snayu*[15,13].

- *Shashtika Shali Lepa* (*Navara Theppu*) which is carbohydrate and nutrient-rich ricemay provide nutritional and metabolic *Shashtika Shali Lepa*, prepared using carbohydrate-rich and nutrient-dense *Shashtika Shali*, may provide nutritional and metabolic support to weakened skeletal musculature by contributing to energy availability and maintenance of muscle tissue required for voluntary movement. When processed with *Ksheera* and administered as a local *Brimhana* therapy, it may further support nourishment of the affected musculature and reduction of stiffness, thereby facilitating gradual improvement in lower-limb functional mobility[16].

- *Anuvasana Basti* with *Sahacharadi Sevya* was selected because *Basti* is considered the primary therapeutic modality for *Vataja vikaras*. *Anuvasana Basti* provides *Snigdha* and *Vata-shamaka* effects and support *Vatanulomana* and nourishment of the tissues. The use of *Sahacharadi Sevya* may have further addressed *Vata*-predominant *Daurbalya*, *Stambha*, and *Cheshta Vaishamya* of the lower limbs. Considering the associated bowel and urinary dysfunction in this patient, the *Apana Vata*-related rationale of *Basti* was also therapeutically relevant. Nevertheless, the specific effects of *Basti* on spinal cord pathology cannot be established from a single case and require further investigation[17].

- *Rajayapana Basti* was selected for its *Vata-shamaka*, *Brimhana*, *Balya*, and *Rasayana* properties, which were considered particularly relevant to the pronounced lower-limb *Daurbalya*, sensory impairment, and functional deterioration observed in the present case. As *Basti* is regarded as the foremost therapeutic modality for *Vata Dosha*, its administration was intended to mitigate *Vata* aggravation, facilitate *Vatanulomana*, and support the restoration of impaired neuromuscular functions. The *Brimhana* and *Balya* properties of *Rajayapana Basti* provide a therapeutic basis for nourishment and strengthening of *Mamsa*, *Majja*, and *Snayu*, which may have supported improvement in lower-limb muscle strength and functional mobility. The effects of *Basti* may involve interactions with the enteric and autonomic nervous systems through visceral afferent pathways, with potential modulation of gut–brain and neuroautonomic responses. This proposed systemic neuroautonomic influence may be relevant to the motor, sensory, and autonomic dysfunctions observed in the present case. Thus, *Rajayapana Basti* may have played an important role in mitigating *Vata* aggravation, supporting neuromuscular function, and contributing to the observed functional improvement[18].

VI. CONCLUSION

The present case demonstrated that an individualized Ayurvedic treatment protocol comprising internal medicines and sequential *Kriyakarma* was associated with mild improvement in neurological function and functional mobility in a patient with non-compressive myelopathy who had experienced progressive neurological deterioration despite prior conventional treatment. Although complete neurological recovery was not achieved, clinical stabilization with no apparent further deterioration was observed during the treatment period. These observations suggest that an individualized Ayurvedic approach may have a potential role as a supportive therapeutic strategy in non-compressive myelopathy, particularly in improving functional status. However, the findings of a single case cannot establish therapeutic efficacy or disease-modifying effects. Further prospective, systematically designed clinical studies are required to evaluate the safety, efficacy, and potential role of Ayurvedic interventions in non-compressive myelopathy.

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