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Case Study

AYURVEDIC MANAGEMENT OF CENTRAL CORD SYNDROME

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ABSTRACT

Central Cord Syndrome is the most common form of incomplete spinal cord injuries often caused by hyperextension injuries. A 42 year old male presented with a upper and lower limb weakness associated with difficulty in walking, paresthesia of both upper and lower limbs and urinary hesitancy since 4 months following an assault, MRI findings indicated posterior disc osteophytes complex causing effacement of thecal sac and spinal canal narrowing at multiple cervical vertebrae levels and anterio-posterior diameter suggestive of cervical cord stenosis with hemorrhagic contusion of cervical spinal cord and radiologically diagnosed as CCS, when patient visited the OPD he was ambulant with support, his SCIM score was 91 and Barthel index was 95. The patient was diagnosed as *Abhightha janya Upadhathu dushty* leading to *Sarvanga vata*, the patient was treated initially with *Deepana pachana* medications followed by *Vyadhi pratyeneeka* medicines along with treatment principles of *Vata Vyadhi, Urusthambam* external treatments included *Rooksha swedas, Udwarthanam*, followed by *Vaitharana vasthy* and *Kayasekam.* Following the treatments his muscle power improved, paresthesia was reduced, urinary hesitancy resolved, he was able to ambulate without support and was able to climb stairs his SCIM 100 and Barthel index was 95. The case study demonstrates central cord syndrome can be managed through Ayurveda.

INTRODUCTION

Central cord syndrome (CCS) is the most common incomplete spinal cord injury CCS is characterized by greater motor impairment in the upper limbs than lower, bladder dysfunction mainly retention, and varying sensory loss below the level of lesion. [1]

In India, about 20,000 new SCI cases occur annually, with an estimated 1.5 million people living with SCI. The incidence rate is roughly 20 per million. [2]

Pathophysiology and Clinical features

Central cord syndrome (CCS) is an incomplete cervical spinal cord injury, resulting usually from hyperextension injuries that compresses the cord via bone, disc, or ligamentum flavum.[4]

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While previously thought to result from central haemorrhage, recent research links upper limb deficits to disruption of dense lateral corticospinal tracts. Other causes include cervical spondylosis, atlantoaxial instability, tethered cord, osteoporosis, and arthropathies. [5]

Damage mainly impairs motor and sensory function in the upper limbs, with severity depending on injury extent. According to ISNCSCI CCS is the most common clinical syndrome, often after hyperextension in those with cervical spondylosis, presenting as incomplete injuries with greater weakness in the upper limbs.[6] The clinical presentation is heterogeneous and varies depending on nerve root injury severity, difference between upper and lower limb motor scores provides an objective diagnostic measure. [7]

Treatment

Initial management of spinal cord injuries starts at the injury site with airway, breathing, circulation, and disability checks (including GCS and pupil exams). Treatment focuses on maintaining perfusion and stable blood pressure, methyl-

prednisolone is no longer routinely advised due to risks; select cases may use a 24-hour infusion. [8,9] Conservative care applies only if there's no instability, otherwise surgery is recommended. Physical and occupational therapy support recovery.[10] Choice of surgical approach depends on lesion location and type: anterior for single-level, posterior for multi-level, and combined for fractures or dislocations.[11]

Patient Information

42 year old right handed male, an construction worker with no known comorbidities was assaulted by his neighbour using a blunt object, he was hit on upper back posterior region of the neck, lower back, patient became unconscious and fell down he was unable to recall the events, he was taken to medical college hospital, Trivandrum upon reaching the hospital he underwent necessary evaluation and was admitted he regained consciousness after 7 days he experienced paresthesia in both forearms and hands, he found it difficult to hold glass he was being fed by his wife he was unable to move his lower limbs he experienced paresthesia over both lower limbs, he was non ambulant for three months, gradually he started walking with support, paresthesia was present over both forearm and hands, he found it difficult to hold small objects and lifting mildly heavy objects like bucket of water, he also experienced paresthesia over both the lower limbs below the knee, wobbling of knees, impaired sense of balance and tendency to fall to the left, he also experienced urinary hesitancy, patient was not on any regular medications; there was no history of any previous trauma or surgical history.

Psychosocial History: He lives with his wife and two daughters, stressors are present as he is unable to work due to his health condition, Bowel movements were regular, normal consistency satisfactory evacuation, Appetite adequate, Micturition hesitancy following the assault, difficulty in sleep initiation since 4 months. Ethanol-2 pegs/day, weekly 5-6 times started drinking by the age of 24 years CAGE questionnaire negative, Nicotine: started smoking since the age of 24 years 2-3 cigarettes per day, abstinence since last 4 years, no narcotics usage reported.

Clinical Findings

On examination: Patient conscious oriented to time, place and person, moderately nourished, cooperative, wide based gait, euthymic mood pallor, icterus, clubbing, cyanosis, lymphadenopathy, edema were absent, vitals-132/90mmhg, left arm sitting, pulse- 82/min, right radial, HR-82/min, RR-18/min, height 62 kg, BMI-22 kg/m2.

Head and neck-Skull normocephalic, atraumatic, oral cavity dentition normal, neck no visible swellings, scar marks, cervical lymphadenopathy. Eyes- PEARL.

Higher mental functions: Intact, Cranial nerves: Intact, Tone- Upper limbs normal, bilateral lower spastic, muscle bulk normal. Power: Shoulder-abduction, adduction, $4^-/5$ elbow, flexion extension, $4^-/5$ wrist-dorsiflexion palmar flexion- 3/5

Lower limbs hips flexion, extension, adduction and abduction-4/5 Knees ankle dorsiflexion and plantar flexion 4/5. Deep tendon reflexes- biceps, triceps, supinator, knee, Ankle- 3+, Abdominal reflex absent, Plantar reflex equivocal.

Sensory; Superficial sensation-Pain- mild sensory dullness on medial side of right leg, light touch temperature, temperature sensation impaired bilateral foot. deep pain, vibration and pressure -intact bilaterally, 2-point discrimination- Impaired on right lower limb, Joint position sense – Intact.

Cortical sensations- intact coordination- Intact, Rhomberg's sign negative, rebound phenomena-absent, dysdiadokinesia- Absent, tandem walking not possible

Diagnostic Assessment

Based on the medical history clinical and radiological findings symptoms of motor weakness of upper and lower limbs with greater degree of residual weakness in the upper limb asymmetric sensory abnormalities, urinary symptoms of hesitancy diagnosis of Central cord syndrome was made.

Radiological findings- Date: 13/12/25

Radiological findings: Post disc osteophytes complex casing effacement of thecal sac and spinal canal narrowing C3-C4, C4-C5, C5-C6, C6-C7, APD- C3-C4-7.8mm, C4-C5-6.2mm, C5-C6-5.8mm,C6-C7-9.3mm. features suggestive of cervical cord stenosis with hemorrhagic contusion of cervical spinal cord.

Ayurvedic Clinical *Assessment*

***Dashavidha* Pareeksha**

Dosha- Vatha kapha pradhana tridosha, Dooshya- Rasa Raktha Mamsa, Asthi majja, Upadhathu-sira snayu, Desha- Anoopa sadharana, Deha desha-sarvanga, Bala: Vyadhi bala- Pravara Rogi bala– Madhyama, Vayas- Madhyama, Prakruthi- Vatha Pitta, Satwam- Alpa satwam, Satmaya- Katu rasa pradhana.

Nidanam- Pramithashanam, Vegadharnam, Chintha Abhighataham, Roopa- Skhalita gathi, Sadam, Toda supthi, Upashayam: Oushadha-deepanam pachanam, vatanulomanam, Vata Kapha haram Snigdha, Annam-Laghu ahara, Vihara- proper rest mild *vyayama* during *snigdha prayoga, Anupashaya- oushadham: Snigdha Prayoga* during initial stages after *rookshana, Annam-Guru Vidahi, Viaharam- Ayasam.*

*Sampraptht*y: *Nidanas* contributed to *Asthimajagatha vata*, *Abhightha* in this context lead to *Vata prakopa* and *Raktha dusthy* further causing *Sira snayu dushty* manifesting as *Sarvangavata.* [12]

***Samprapthi* Flowchart**



Therapeutic Intervention

Table 1: Timeline of Clinical Assessment and Treatment

Date	Medications	Treatments	Remarks
4/5/25	*Amruthotharam kashayam*-90 ml bd before food morning and evening T. *Shaddharanam*-1-0-1 after food	*Udgarshanam* with *Kolakulathdi choornam* + *Triphala Kashayam*	
9/5/25	*Amruthotharam kashayam*-90 ml bd before food morning and evening T. *Shaddharanam*-1-0-1- after food	*Sarvangadhara*- with *Dashamoola kashayam*	Mild reduction in paresthesia
14/5/25	*Sahacharadi Kashyam*-90 ml before food morning and evening *Gandharva Erandam*-5 ml with hot water at bedtime	*Rooksha swedam- Kolakulathdi choornam* *Lepanam- Nagaradi Choornam*- Neck	Reduction in heaviness, improvement in Gait able to walk without support. SCIM score -92
24/5/25	*Sahacharadi Kashayam*-90 ml bd before food morning and evening	*Sankara swedam*- with *Kolakulathdi choornam* *Lepanam*- Continued	Relief in paresthesia
25/5/25	*Sahacharadi Kashayam*-90 ml bd before food morning and evening. *Karaskara Gritham*- 5g- with *Kashyam*	*Sankara swedam*- continued *Lepam* Continued	Heaviness over upper and lower limbs reduced.
2/6/25	*Sahacharadi Kashayam*-90 ml before food morning and evening. *Karaskara Gritham*- 5g- Bd with *Kashyam*	*Choornapinda swedam*- with Kethakimooladi *Thailam*- 5 days	Heaviness and paresthesia increased
5/6/25	*Sahacharadi Kashayam*-90 ml -Bd- before food. *Karaskara Gritham*- 5g- Bd with *Kashyam*	*Rookshaswedam*-with *Kolakulathadi Choornam*- 3 days	Mild relief in sensory symptoms and heaviness.
10/6/25	*Sahacharadi Kashayam*-90 ml Bd- before food morning and evening. *Karaskara Gritham*- 5g- Bd with *Kashyam*	*Abhyangam oshma swedam-Chinchadi Thailam*	Mild relief in symptoms
22/6/25	*Sahacharadi Kashayam*-90 ml Bd- before food morning and evening. *Karaskara Gritham*- 5g- Bd with *Kashyam*	*Pichu* with *murivenna* over cervical region	Mild reduction in paresthesia
24/6/25	*Ashtakatwara Thailam*-2.5 ml with warm water two times before meals.	*Sankara swedam*- with *Kolakulathadi Choornam* - 3 days	Improvement in sensory symptoms
27/6/25		*Vaitharana Vasthy* for 5 days	Relief in paresthesia
3/7/25	*Ashtakatwara Thailam*-2.5 ml with warm water two times before meals.	*Kayasekam-Sahacharadi Thailam*-7 days	Paresthesia reduced completely. SCIM score -100

Advice on Discharge

Ashtavaragam Kashyam- 90ml bd- before food, *Ashtakatwara Thailam*- 2.5ml before food in the morning for one month. After one month, *Sarvamayanthaka gritham*-10 gm at bedtime with hot water.

Condition at discharge: At the time of discharge patient was ambulant without support, impaired sense of balance while walking reduced, significant relief in paresthesia, urinary hesitancy resolved completely, muscle power in upper limb was $4^-/5$, spasticity in lower limbs persisted. Clinical assessment post treatment -SCIM Spinal cord independence measure was 100, Barthels index was 100.

Table 2: Symptom Assessment

Symptoms	Before treatment	After Treatment
Muscle power	Weakness, clumsiness of hands	Moderate improvement
Paresthesia	Both Forearms and legs	Reduced
Bladder	Hesitancy	Normal voiding
Gait	Ambulant with support	Ambulant without support

Table 3: Clinical scale Assessment

Assessment scales	4/5/25	16/6/25	3/7/25
SCIM	91	91	100
Barthels Index	95	95	100
Ashworth Scale	3	3	3

Table 4: Clinical examinations

Parameters	4/5/25	16/6/25	3/7/25
Tone - Lower limbs	Spasticity	Spasticity	Spasticity
Power– Shoulder, elbow, wrist	$4^-/5$	$4^-/5$	4/5
Wrist	3	3	$4^-/5$
Lower limbs	4^-	4	4
Deep tendon reflexes biceps, triceps, supinator, knee, ankle	3+	3+	3+
Superficial sensation - Pain	Mild sensory dullness on medial side of Right leg	Improved perception	Improved perception
Temperature	impaired both foot	impaired both foot	Mild improvement in perception
Deep pain, vibration, pressure	Intact bilaterally	Intact bilaterally	Intact bilaterally
2-point discrimination	Impaired on Right lower limb	Impaired on Right lower limb	Impairment persists

Follow Up

Patient came for follow up after 6 weeks he was feeling better he was able to walk without support mild to moderate spasticity was present in the lower limbs, he was able to conduct his ADLs independently no paresthesia, muscle power in both upper and lower limbs was 4, no bladder symptoms were present, reflexes were brisk, sensory dullness and temperature perception had improved.

DISCUSSION

Central cord syndrome (CCS) is a common incomplete spinal cord injury, typically has a bimodal age distribution with different etiologies, usually results from hyperextension injuries of the cervical spine, caused due to compression by bone, discs, or ligamentum flavum.

The case was managed as *Abhightha janya Upadhathu dushti* leading to *Sarvanga vata*. Treatment included *Pachana* and *Deepana*, external therapies *Udwarthanam* and *Lepanam*, and *Kashayadhara*, *Rooksha Sweda kriyas.* The patient showed improved mobility and reduced urinary hesitancy, *Abhyangam* and *Oshma Swedam* and *Vaitharana Vasthy*, *Kayasekam* helped reduce paresthesia and improve muscle power.

Amruthotharam Kashayam and *Shaddharanam choornam* were selected for *Deepana* and *Pachana* properties, *Sahacharadi kashayam* with its *Vatha kapaha hara, Teekshna gunas* reduced *Kapha avarana*, *Gandharva erandam* 10ml at bedtime for *Vatanulomana, Karaskara gritham* 5gm before food was advised it is *Tridosha shamana*, *Shoola prashamana*, and its action on *Raktha dhathu.*

After *Rookshanam* phase *Choorna pinda swedam* with *Kethakimooladi Thailam* indicated in *Asthimajja-gatavatam* was opted after three days of

swedam patient reported increase in paresthesia, hence *Rooksha swedam* was restarted, which reduced paresthesia.

Abhyangam and *Ushma swedam* with *Chinchadi Thailam* indicated in *Sarvangavata* was given for 7 days patient reported mild relief in paresthesia, as the patient was predominantly experiencing *Upashaya* in *Rooksha ushna* procedures treatment aspects of *Urusthamba* were considered. *Ashtakatwara Thailam* 2.5ml bd before meals with hot water was administered.

Vaitharana Vasthy was done for 5 days during which patient has relief in symptoms of paresthesia, in the last stage *Kayasekam* with *Sahacharadi Thailam* for *Vatha shamanam* and improving *Dhathu balam*, there was improvement in sensory symptoms, at the time of discharge most of his symptoms resolved and he was able to walk without support. *Ashtavargam Kashayam* having *Vata kapha hara avarnahara* property *and Sarvamayantaka gritha* for improving *Dhathu balam* were prescribed as follow up medications.

CONCLUSION

The case was managed as *Abhightha* leading to *Upadhathu sira snayu dushty* causing *Sarvangavata* it highlights management of Central cord syndrome with ayurveda medications and treatments which included *Rookshan karma*, *Urusthambha* treatment principles *Samanya vatavyadhi chiktsa,* there was significant improvement in weakness, gait, paresthesia following treatments QOL life also improved significantly patient was able to carry out his activities of ADL independently, Post treatment improvement in SCIM, Barthels index support the findings, This case report highlights the potential role of Ayurvedic interventions in improving functional outcomes in Central Cord Syndrome. The observed clinical and functional improvements warrant further investigation through larger controlled studies integrating conventional and Ayurvedic treatment approaches.

Patient Perspective

The patient reported significant improvement in mobility, hand function, bladder control, and overall quality of life, enabling independent performance of daily activities and improved psychosocial well-being.

Declaration of patient consent

The authors certify that they have obtained all appropriate consent forms, in the form patient has given his consent for his images and other clinical information to be reported in the journal.

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