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Case Study

NEURO-MUSCULAR REHABILITATION THROUGH *BASTI* AND *MAMSA PINDA SWEDA* IN HIRAYAMA DISEASE

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ABSTRACT

Hirayama disease is characterised by juvenile onset of unilateral muscular atrophy of distal upper extremity. The disability originates with impaired functioning of anterior horn cells of the cervical cord. Studies consistently note a loss of the cervical lordosis and compression of the cervical cord by the dural sac in forward flexion. Here is a case report of a 24-year old male with Hirayama disease who had been treated as inpatient. The case was considered as a *Vatavyadhi* and the treatment protocol applied accordingly with incorporation of treatment of *Asthikshaya, Vishwachi* and *Bahushosha* particularly. The treatment included *Abhyanga, Seka, Mamsa Pinda Sweda, Mustadi Yapana Basti* and *Rasayana Oushadhi.* Even though the patient condition was irreversible, he was able to regain the functional status after restarting the treatment. The case highlights the improvement in quality of life of the patient after Ayurvedic management.

INTRODUCTION

Hirayama Disease, also known as Monomelic Amyotrophy (MMA) is a rare motor neuron disease. It was first described in 1959 in Japan. It is characterised by progressive weakness and atrophy in distal upper extremities. Occurs in the age group between 15 and 25 years[1,2]. It involves asymmetric muscles particularly hand and forearm sparing brachioradialis muscle. This condition usually progresses for 1 year or 2 years and then eventually arrests. Main pathology involves chronic ischemic changes to the anterior horn cells of cervical spine secondary to dural sac laxity[3]. Researcher, including Hirayama believe that forward displacement of the cervical dural sac and compressive flattening of the lower cervical cord during neck flexion is the contributing factor. Common presentation is unilateral atrophy in the distal upper limb associated with cold paresis. Sensory changes are rare and pain usually doesn't arise until atrophy spreads to upper arm and shoulder.

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Though Hirayama disease is not directly mentioned in Ayurvedic texts, this condition can be better related to the diseases of Vata. Based on the presenting features, *Asthikshaya*[4], *Vishwachi*[5] and *Bahushosha* resembles Hirayama disease. Symptoms like *Mamsa Bala Kshaya* (progressive muscle wasting*), Bahu Karma Kshaya* (loss of function in the upper limb) respectively shows a closely resemblance to the neurological features seen in Hirayama. Here we report a case of Hirayama Disease who was treated with Ayurvedic interventions and shown promising results.

Case report

Chief complaints

Complaints of weakness in distal part of bilateral upper limbs in the last 8 months.

Associated complaints

Pain in right arm, tremors in bilateral hands, fasciculations in upper arm.

History of present illness

A male patient aged 24 years was apparently normal 8 months ago. Then he started experiencing weakness in left palm and fingers. He found difficulty in holding objects, etc. It was gradual in onset and progressive in nature. Then he started experiencing pain in right palm. He also observed thinning of both forearm and palms after the onset of symptoms,

involuntary movements in bilateral hands and twitching in upper arm. No history of trauma, fever, radiating pain. For all these complaints, he visited our hospital for further management.

Past History: Nothing specific

Family history: Nothing Significant

Table 1: Subject's personal history

Name: xyz	Bowel: Regular
Age: 24 years	Appetite: Good
Marital status: Unmarried	Habits: None
Occupation: Industrial Machine operator	Height: 167cm
Diet: Vegetarian	Weight: 56kg

Table 2: *Ashtasthana pareeksha*

Nadi	*Prakruta*, 70bpm
Mutra	*Prakruta* 3-4times/day 1-2 times/night
Mala	*Prakruta* 1 time/day
Jihwa	*Alipta*
Shabda	*Prakruta*
Sparsha	*Prakruta*
Drik	*Prakruta*
Akriti	*Sama*

Table 3: *Dashavidha pareeksha*

Prakriti: Vata Pitta	*Satmya: Katu pradhana sarva rasa satmya*
Vikriti: Vata Pradhana	*Ahara shakti: Madhyama*
Sara: Madhyama	*Vyayama shakti: Madhyama*
Samhanana: Madhyama	*Vaya: Madhyama* (24 years)
Satva: Madhyama	*Pramana*: Ht- 167cm Wt- 56kg

Systemic examination

Cardiovascular system: S1 S2 heard, no abnormality detected.

Respiratory system: NVBS heard, no abnormality detected.

Gastrointestinal system: P/A- soft, non-tender

Musculoskeletal system examination

Spine

Curvature: Normal

Tenderness: Absent

Range of movements

Flexion, Extension, Lateral flexion- Possible

Lhermittes sign, Spurlings- Negative

Gait- Normal

Central nervous system

Higher mental functions- Intact, no abnormality detected

Cranial Nerves- Intact

Motor System examination

Table 4: Motor System Examination

Motor system		Right	Left
Muscle Bulk	Upper limb	Wasting (present in forearm, thenar and hypothenar, intrinsic hand muscles)- Mid forearm- 20.5cm	Wasting (present in forearm, thenar and hypothenar, intrinsic hand muscles)- Mid forearm- 21cm
	Lower limb	Normal	Normal
Muscle Tone	Upper limb	Flaccid	Flaccid
	Lower limb	Normal	Normal
Power	Upper limb- IP flexion and extension	3/5	4/5
	Lower limb	5/5	5/5
Reflexes	Biceps Triceps Supinator Knee Ankle Plantar	+ + + ++ ++ Flexor	+ + + ++ ++ Flexor

Sensory System: Intact
Involuntary Movements
Tremors: Present in B/L hands
Fasciculations: Present
Co- ordination: Intact

Table 5: *Samprapti ghataka*

Dosha	*Vata pradhana*	*Udbhavasthana*	*Pakvashaya*
Dushya	*Mamsa, Asthi*	*Sancharasthana*	*Sarva shareera*
Agni	*Jatharagni, Dhatvagni*	*Vyaktasthana*	*Bahu dwaya*
Agnidushti	*Mandagni*	*Adhistana*	*Bahu*
Srotas	*Mamsavaha, Asthivaha*	*Rogamarga*	*Madhyama*
Srotodushti	*Sangha, Vimargagamana*	*Sadhyasadhyata*	*Yapya*

Table 6: Treatment protocol adopted

Panchakarma	***Shamana Oushadhis***	**Advice on Discharge**
• *Sarvanga Abhyanga* with *Ksheerabala Taila*[6] followed by *Dashamoola Kashaya Seka* for 3 days • *Sarvanga Abhyanga* with *Ksheerabala Taila* followed by *Mamsadi Pinda Sweda*[7] for 21 days • *Koshta Shodhana* with *Gandharva Hastadi Eranda Taila* • *Mustadi Yapana Basti*[8]- *Karma* pattern • *Anuvasana Basti* with *Brihat Chagaladya Ghrita*[9]	• *Ekangaveera rasa* 1 BD A/F • *Dashamoolarishta+ Balarista* 20ml BD A/F • *Ashwagangha Churna* 5gm BD A/F with milk • Cap. Aswal Plus 1BD A/F	• Physiotherapy exercises were advised. • Continue *Shamana Oushadhi.*

OBSERVATION AND RESULTS

Table 8: Observation and Results

Treatment	Observation
Sarvanga Abhyanga with *Ksheerabala Taila* followed by *Dashamoola Kashaya Seka.*	No change
Sarvanga Abhyanga with *Ksheerabala Taila* followed by *Mamsadi Pinda Sweda.*	Patient had improvement in the muscle bulk, was able to lift 5L water, fasciculations disappeared, Intensity of tremors reduced.
Mustadi Yapana Basti, Anuvasana Basti with *Brihat Chagaladya Ghrita.*	Patient had improvement in the muscle bulk, was able to lift 5L water, fasciculations disappeared, intensity of tremors reduced.

Table 9: Overall assessment before and after treatment

Parameters		BT	After *Pariseka*	After *Mamsadi Pinda Sweda*	After *Basti*	Overall Effect
Clinical- Motor	Muscle Power	Upper limb: 3/5	3/5	4/5	4/5	50%
	Muscle wasting	Right mid forearm- 20.5cm Left- 21cm	No change	Right- 21.5cm Left- 22.5cm	Right- 21.5cm Left- 22.5cm	5%
	Fasciculations	Present	No change	Absent	Absent	100%
Neurological signs	Tremors on finger extension	Present	No change	Reduced	Reduced	50%
Functional	DASH Score	74.10	74.1	62.5	62.5	15.7
	ADL Score (Kartz Index)	4	4	6	6	100%
	Modified Ranking Scale	3	3	2	2	33.33%

DISCUSSION

In the present case study, an average improvement of 50.58% was found. All the assessment parameters showed improvement. Since, we don't get direct reference of Hirayama Disease in *Samhitas*, the treatment adopted is mainly based on the involvement and *Avastha* of *Dosha, Dhatu, Roga* and *Rogi bala*. In this case, there was mainly involvement of *Vata Dosha*, *Kapha kshaya* (which can be understood as the reduced *Sthirata*- loss of elastin in the dura), and hence *Vatavyadhi Chikitsa* was adopted. Considering the above case to be *Dhatu kshaya Avastha*, mainly *Brihmana* line of treatment was planned.

Dashamoola Kashaya Seka

Dashamoola is considered to have actions like *Balya, Vatahara*. It contains constituents like flavonoids, alkaloids, saponins and glycosides with following effects- Anti-inflammatory, analgesic, neuroprotective, anti-oxidant and muscle strengthening which helps reduce neuro-inflammation and improve micro-circulation in wasted muscles. *Pariseka* facilitates deeper penetration of active principles, enhancing local circulation and nourishes the affected tissues.

Mamsadi Pinda Sweda

This can be considered under *Snigdha- Ushna Sweda* prepared with *Aja Mamsa* and *Shashtika shali*, which exerts both *Swedana* and *Brihmana* effects. The *Ushna- Snigdha guna* pacifies *Vata*, while the contents of *Mamsa* and *Shashtika Shali* provide *Dhatu poshana* to wasted muscles.

Aja mamsa is described in Ayurveda as *Balya* and *Brihmana*, possessing *Madhura rasa, Snigdha guna* and *Madhura vipaka*, which directly contribute to *Mamsa dhatu poshana*. When used externally as *Pinda Sweda*, due to its *Snigdha* and *Ushna guna*, it pacifies aggravated *Vata*, promoting *Dhatu Vardhana*, and restoring strength to *Mamsa* and *Snayu dhatus*. By the principle of '*Samaanam Mamsam Vardhayati*', *Ajamamsa* locally supports regeneration of wasted muscles.

Shashtikashali has higher protein content about 16.5%, thiamine about 26-32%, riboflavin 4-24% and niacin 2-36%. *Mamsa* also has higher protein content. Protein is made up of amino acids, which act like building blocks for the body. It gives muscles the amino acids necessary to repair and rebuild. Skeletal muscle contractile proteins are the largest protein reservoir and can be rapidly utilized to supply amino acids to the entire organism during fasting or stress. These proteins are essential to maintain the muscle bulk, to facilitate muscle growth and maintain its functionality.

Mustadi Yapana Basti

Mustadi Yapana Basti is a specialized form of *Basti Karma* that combines *Vata shamana* with *Brihmana* and *Rasayana* effects. Main ingredients include *Musta, Bala, Ashwagandha, Rasna, Shatavari, Yashtimadhu, Guduchi, Panchmoola, Taila, Dugdha* and *Madhu*, etc. *Sadyobalajanana* and *Mamsabalajanana* are the *Phalashruti* mentioned under this *Basti*. From a modern standpoint, the formulation delivers bioactive compounds like alkaloids, saponins, flavonoids, amino acids and antioxidants through rectal absorption, exerting neuroprotective, anti-inflammatory and anabolic actions, thus offering a sustained therapeutic approach for halting disease progression, improving

muscle bulk and restoring functional capacity in Hirayama disease.

CONCLUSION

Hirayama disease is a rare, non-fatal disease that is severely debilitating but self-limiting disease which lacks conservative management. In such case, Ayurveda plays a key role. In this case, patient was treated on the basis of *Vatavyadhi* management focussing on *Asthikshaya, Bahushosha* with both internal and external treatment. After three weeks of treatment, patient got significant symptomatic improvement in symptoms of motor function. Though incurable, Ayurveda *Chikitsa* can improve day to day functioning. Hence, one should analyse the *Avastha* of *Dosha, Rogabala, Rogibala* and decide the treatment.

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