



UNDERSTANDING DANDY WALKER MALFORMATION FROM THE PERSPECTIVE OF KAPHAVRUTHA VYANA VATA

Dr. Sreerekha Chandran¹, Prof. Dr. Chitta Ranjan Das², Dr. Jeniffer Ponsingh³,

Dr. Aswini S K Varier³

1. PG Scholar, Department of Panchakarma, Sri Jayendra Saraswathi Ayurveda College, and Hospital, 4/295 Chennai-Banglore High Road, Nazareth, Chennai 600123, Tamil Nadu, India

2. Principal and HOD, Department of Panchakarma, Sri Jayendra Saraswathi Ayurveda College, and Hospital, 4/295 Chennai-Banglore High Road, Nazareth, Chennai 600123, Tamil Nadu, India

3. Assistant Professor, Department of Panchakarma, Sri Jayendra Saraswathi Ayurveda College, and Hospital, 4/295 Chennai-Banglore High Road, Nazareth, Chennai 600123, Tamil Nadu, India

ABSTRACT

Dandy-Walker malformation (DWM) is a rare brain malformation that occurs during foetal development and affects the cerebellum and posterior fossa. It is characterized by abnormal development of the cerebellum, which controls movement, balance, and cognitive ability. The part that joins the cerebellum's two hemispheres does not fully form, and the space behind the cerebellum and the fourth ventricle enlarge with cerebrospinal fluid. The estimated prevalence of Dandy-Walker malformation and related variants is about 1 in 30,000 live births and accounts for approximately 7.5% of the cases of infantile hydrocephalus. It is most common posterior fossa malformation. A female patient of 30-year-old presented with loss of balance while walking, associated with pain and numbness over right upper limb for 1 year, came to Panchakarma OPD of Sri Jayendra Saraswathi Ayurveda College and Hospital, Chennai. In Ayurveda this condition can be best correlated to *Kaphavruthavyana Vata*. The treatment modality adopted here is *Avaranajanya Vatavyadhi chikitsa*, which included *Amapachana* and *Brihmana Chikitsa* along with *Samana Oushadhis*. The patient's gait improved substantially following treatment.

INDEX WORDS: Dandy-Walker Malformation, *Kaphavruthavyana Vata*, *Vatavyadhi Chikitsa*

INTRODUCTION

Dandy-Walker malformation is a condition that affects brain development, particularly the cerebellum, which is responsible for coordinating movement. In individuals with this disorder, parts of the cerebellum do not develop properly, leading to structural abnormalities visible on medical imaging. The central region of the cerebellum, known as vermis, may be missing, underdeveloped, or positioned incorrectly. The right and left hemispheres of the cerebellum can be smaller than normal. Affected individuals often have an enlarged fluid filled space between the brainstem and cerebellum (the fourth ventricle) and an unusually large posterior fossa, the part of the skull housing the cerebellum and brainstem. These changes can lead to difficulties with movement, coordination, cognitive abilities, mood regulation, and other neurological function¹. In Ayurveda *Kaphavrutavyana Vata* refers to a condition where *Kapha* obstructs the normal movement of *Vyana Vata*, which is responsible for circulation, distribution of energy and overall movement in the body. This obstruction leads to a disturbance in circulation, leading to various symptoms. Informed consent was taken from patient.

CASE REPORT

CHIEF COMPLAINT WITH DURATION

A 30-year-old female presented to Panchakarma OPD with a one-year history of imbalance while walking, requiring support. She also experienced pain and numbness in her right upper limb over the same duration along with slurred speech.

HISTORY OF PRESENT ILLNESS

Patient reported difficulty maintaining balance while walking and requires support. She also experienced slurred speech, accompanied by pain and numbness in her right upper limb. Patient also complaints of low back ache. One year ago, she collapsed and lost consciousness leading to hospitalization, where she was diagnosed with Dandy Walker Malformation. Patient got admitted in IPD of Sri Jayendra Saraswathi Ayurveda College and Hospital for further management

PAST HISTORY

The patient has experienced delayed developmental milestones.

N/H/O Hypertension, Diabetes Mellitus.

FAMILY HISTORY

The patient's parent had a consanguineous marriage. Her father was diagnosed with diabetes at the age of 35 and later underwent bilateral lower limb amputation. Her brother experienced delayed developmental milestones and is currently on medication.

DRUG HISTORY

Pregabalin tablet 75 mg 1-0-1 A/F

Baclofen tablet 10 mg 0-0-1 A/F

EXAMINATION ON ADMISSION

General condition of the patient was good and is given below. (Table 5)

No pallor/icterus/cyanosis/oedema/lymphadenopathy

SYSTEMIC EXAMINATION

The systemic examination of the patient is tabulated below. (Table 6)

CRANIAL NERVE EXAMINATION

The cranial nerve examination of the patient is tabulated below (Table 7)

MOTOR SYSTEM EXAMINATION (LOWER LIMB)

Body position-Extended limbs

Involuntary movements -Absent

Muscle tone-Normotonic (Table 1)

Muscle power	Right	Left
Upper limb	4/5	5/5
Lower limb	3/5	4/5

MEDICAL RESEARCH COUNCIL MUSCLE POWER SCALE²

0	No muscular contraction
1	Flicker or trace of contraction
2	Active movement with gravity eliminated
3	Active movement against gravity
4	Active movement against gravity and some resistance
5	Active movement against full resistance

REFLEXES (Table 2)

DTR	Right	Left
Biceps reflex	2+	2+
Triceps reflex	2+	2+
Knee reflex	2+	2+
Ankle reflex	2+	2+

GRADATION FOR REFLEXES WAS ASSESSED AS BELOW

0	Reflex absent
+	Elicitable only on reinforcement
++	Normal
+++	Exaggerated
++++	Brisk with clonus

GAIT

Length, speed, rhythm, of steps-slow speed

Symmetry and base of gait-Asymmetric gait

Steadiness-Unsteady

Arm Swing-Not present

Type of walking-Tandem gait

Turns-Slow, unsteady

COORDINATION

Coordination tests of upper limb

1. Finger to Nose Test- Able to do
2. Finger to finger test-Able to do
3. Finger to Doctor's finger test-Able to do
4. Adiadochokinesia-72 times per minute
5. Rebound phenomenon-Good
6. Grip strength right hand-mild

COORDINATION OF LOWER LIMB

1) Walking in straight line-Shivering present

2) Romberg Test-Towards left

3) Foot tapping Test- Slow

ASHTAVIDHA PARIKSHA (Table 3)

<i>Nadi</i>	<i>Vata Pitta</i>
<i>Mala</i>	<i>Prakrutha</i>
<i>Mutra</i>	<i>Prakrutha</i>
<i>Jihva</i>	<i>Lipta</i>

<i>Shabda</i>	<i>Vikrutha</i>
<i>Sparsha</i>	<i>Anusha Sheeta</i>
<i>Drik</i>	<i>Madhyama</i>
<i>Akriti</i>	<i>Madhyama</i>

SAMPRAPTI GHATAKA (Table 4)

<i>Dosha</i>	<i>Kapha Vata</i>
<i>Dushya</i>	<i>Rasa, Mamsa, Majja</i>
<i>Agni</i>	<i>Sama</i>
<i>Srotas</i>	<i>Rasa, Mamsa</i>
<i>Srotodhusti Prakara</i>	<i>Vimarga gamana, Sanga</i>
<i>Udbhava sthana</i>	<i>Pakvashya</i>
<i>Sanchara Sthana</i>	<i>Sarvashareera</i>
<i>Vyakta sthana</i>	<i>Adhasakha</i>

INVESTIGATION

MRI IMPRESSION (Date:04/05/2023)

Large retro cerebellar CSF intense cystic space of size 3.5^x 4.9^x 4.4 cm (≈volume 38cc) seen communicating with the fourth ventricle with other features as:

- Mild dilation of the fourth ventricle.
- Mild hypoplasia and upward displacement of the cerebellar vermis.
- Displacement of bilateral cerebellar hemisphere anterolaterally.
- Superior displacement of torcular herophili above the level of lambdoid with elevated tentorium cerebelli
- Evidence of thinning of the corpus callosum noted
- Bilateral frontal horn, body, atria, temporal and occipital horns of lateral ventricle, foramen of Monro, third ventricle and aqueduct of sylvius appear to be enlarged (Evans index:0.29 and callosal angle 93.5 degrees)
- Vascular loop of bilateral anterior inferior cerebellar artery seen entering the proximal aspect of internal acoustic meatus (occupying <50%).

MANAGEMENT

Total duration of treatment was 15 days. Treatment underwent by the patient is tabulated below (Table 8,9)

Table 5: General examination of the patient

Temperature	36.8 °c
Pulse	83 bpm
Respiratory rate	17/min
Blood pressure	100/70 mm Hg
Tongue	Coated
Height	158 cm
Weight	53 Kg

Table 6: Systemic Examination

Respiratory system	Normal vesicular breathing sound
CVS	S1, S2 heard, no any added sounds
CNS	Conscious and oriented to time, place, person
P/A	Soft, no tenderness

Table 7: Cranial nerve examination

HIGHER MENTAL FUNCTIONS	
Level of consciousness	Conscious
Attention	Attentive
Orientation to time, place	Well oriented
Language	Less fluency, Slurred Speech
Memory (remote, recent)	Intact
CRANIAL NERVES	
Olfactory nerve	Intact
Optic nerve	Peripheral vision- Intact
Ocular nerves: Oculomotor	Smooth pursuit-slow
Trochlear	Saccades-slow
Abducens	Nystagmus- present
Trigeminal nerve	corneal reflex-intact jaw jerk reflex-intact
Glossopharyngeal and Vagus nerve	Palate elevation: Normal Swallowing-Good

	Voice-slurred, hoarseness Gag reflex-Intact
Spinal accessory nerve	Head against resistance- Reduced resistance shrug shoulders-intact

Table 8: Oral medication administered

S.No	ORAL MEDICATION	No of days	DOSE	TIME
1	<i>Dhanadhanyanadi kashyam</i>	15 days	15 ml TID	Before food
2	Cap Nuro	15 days	1 TID	After food
3	Tab <i>Smritisagara Rasa</i>	15 days	1 TID	After food

Table 9: External procedures done

Sl.No	No of days	TREATMENT	ACTION	REMARKS
1	3 days	<i>Agni chikitsa</i>	<i>kaphavata hara, Amapachana vedanasthapaka</i>	Pain over right upper limb slightly reduced
2	8 days	<i>Sarvanga Utsadana with kolakulathadi churnam mixed with Dhanyamla</i>	<i>Srothorodha hara Amapachana Avaranaghna</i>	Relief of low back ache and pain over right upper limb noted
3	8 days	<i>Mustadhi Yapana Basti</i>	<i>Vatahara, Bruhmna</i>	Significant improvement noted in her gait
4	7 days	<i>Shiropichu with Karpasthyadhi Tailam</i>	<i>Vatakapha samaka Balya</i>	Sleep improved
5	7 days	<i>Sarvanga Abhyanga with Mahamasha Taila</i>	<i>Vatahara</i>	Pain over lower back and right upper limb

				reduced considerably
6	7 days	<i>Sarvanga Masha Pinda swedam</i>	<i>Balya, Bruhmana, Vata hara</i>	Patient was able to walk without support

RESULT AND DISCUSSION

Dandy walker syndrome, a congenital condition affecting brain development delays poor coordination, balance problems, and sometimes seizures, hydrocephalus, and vision or hearing impairments. Based on the symptoms presented by the patient, treatment was planned by adopting the principles of *Kaphaavrutha Vyana Vata*, incorporating *Deepana*, *Pachana*, *Rukshana* and *Brhmana* therapies. *Lakshanas* of *Kaphavruthavyana Vata* includes *Guruta sarvagatranam*, *Sarvasandhi Asthi Ruja*, *Gatisanga*, *Rujaadhika*³. The treatment modality explained in classics is *Kaphagna* and *Marutasya Anulomana*⁴.

Shamanaousadhi

Dhanadhanyanadhi Kashayam is indicated in *Ardita* and *Akshepaka*⁵. The ingredients are mainly *Ushna*, *Kapha Vatahara* and *Vatanulomana*.

Capsule Nuro consists of *Rasa Sindhura*, *Sameera Pannaga Rasa*, *Swarna Makshika Bhasma*, *Triphala*, *chitraka*, *Shuddha Guggulu*. It helps in controlling all type of *Vata* and helps in proper blood circulation.

Smritisagar rasa is one among *Medhya Rasayanas*. The ingredients are mainly *Katu rasa* and *Ushna Virya*, regulates *Sadhaka Pitta* and thus have action on *Medha*. It also has *Kaphavata hara* property⁶.

Rukshana:

Agni Chikitsa is a well- known traditional folklore therapy that utilizes dry ingredients such as *Lashuna*, *Lavanga*, *Maricha*, *Sarshapa*, and *Haridra* along with fresh leaves of *Kshudra Agnimantha*, *Vanatulsi*, *Nirgundi*, *Papata*, and *Bandha*. These components possess *Ushna Deepana*, *Pachana*, *Rookshna* property. It helps in *Ama Pachana* and helps in restoring the *Agni*.⁷ *Utsadana* with *Kolakulathadhi Choorna* mixed with *Dhanyamla* acts in mitigating *Kapha* and helps to remove the *Avarna* to *Vata* and helps in its proper movement.

Yapana Basti

Basti is administered through the anal canal into the *Pakvashaya* but has a systemic impact on the entire body. This occurs through the active properties of its ingredients and by stimulating gut brain axis. In classics it is explained a well administered *Basti* remains in the *Pakvashaya*, *Sroni*, and below *Nabhi* while its *Virya* spreads throughout the body via *Srotas*.⁸ In *Samyak lakshana* of *Basti Vatanulomanam* is mentioned.⁹ *Basti* serves two primary functions: expelling accumulated *Doshas* and nourishing the body. First, the active components of the medicinal substances in *Basti* are absorbed, producing systemic effects. Secondly it aids in eliminating harmful

substances or *Doshas* responsible for diseases from the colon while also stimulating higher centres through gut brain axis. *Yapana basti* is considered as *Napumsaka Vasti*¹⁰. It acts both as *Lekhana* and *Bruhmana*. *Mahamasha taila Abhyanga* and *Masha Pinda Sweda* helps in alleviating *Vata* and has *Brhmana* effect. According to a paper published by Raksha et al in the year 2024, it revealed that Basti had ubiquitous role in *Swapnavrutti*, *Buddhi indriya samprasadana*, *Medhakrut* and does *Harshana*.¹¹

Shiropichu

The absorption of *Karpasasthyadhi Taila* is enhanced at the vertex because the skin in this area is thinner. Due to its *Sukshma* and *Vyavayi* properties, the oil quickly penetrates deeper tissues. *Manovaha Srotas* allowing the oil to influence neurological disorders.

Probable mode of action:

Agni Lepa Chikitsa and *Utsadana* with *Kolakulathadi Choorna* mixed with *Dhanyamla* acts as *Deepana* and *Amapachana*. It plays a role in removing the *Avarna* of *Kapha*. *Sarvanga Abhyangam* with *Maha Masha Tailam* and *Masha Pinda Sweda* acts as *Vatahara* and *Brhumana*. *Mustadhiyapanavasti* helps in *Agni Deepana*, *Vatanulomana* and *Bruhmana*. Hence adhering to the principles of *Kaphavruta Vyana Chikitsa* stating *Vata Kaphaghna Marutasyanulomnam*.

CONCLUSION

After 15 days of treatment the patient exhibited significant improvement in gait, walking independently and turning without losing balance issues. Her walking speed increased and could climb stairs without assistance. Additionally, overall health improved with a noticeable reduction in lower back and right upper limb pain. The Ayurvedic treatment protocol which followed above enhanced her ability to perform daily activities with ease, ultimately improving her quality of life.

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