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Ayurvedic Protocol in the Management of Post-COVID steroid induced Avascular Necrosis: A Case Study

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ABSTRACT:

Steroid-induced Post-COVID Avascular Necrosis (AVN) of the hip has emerged as a significant musculoskeletal complication. Even though steroids can be life-saving by controlling excessive inflammation, prolonged or high-dose therapy may impair blood supply to the femoral head, leading to ischemia and subsequent bone tissue death. Clinically, AVN presents with persistent hip pain, restricted range of motion, and stiffness. It often progresses to femoral head collapse if not diagnosed and managed early. Imaging techniques such as MRI play a critical role in early detection. In Ayurvedic understanding, there is no direct reference to AVN. It can be correlated with conditions such as *Asthi-Majjagata Vata, Asthi-Majja Kshaya, and Ubhyashrita Vatarakta,* all of which involve vitiation of *Vata dosha* affecting the bone (*Asthi*) and marrow (*Majja*). These conditions fall under the broader category of *Vatavyadhi*, or *Vata*-dominant disorders. Modern medical treatments like NSAIDs, core decompression, bone grafting, and total hip replacement are often expensive, may cause complications, and usually provide only short-term relief. In contrast, Ayurveda offers a holistic and individualized approach aiming at the restoration of *dosha* balance, rejuvenation of bone tissue (*Asthi dhatu*), and enhancement of overall vitality. This paper attempts to explore AVN of the femoral head through the lens of *Vatavyadhi* and discuss an Ayurvedic management protocol involving *Snehana* (oleation), *Swedana* (sudation), *Basti* (medicated enemas), and *Rakthamoksha* (blood-letting), which may contribute to symptomatic relief, improved joint function, and better quality of life.

KEYWORDS: *Asthi Majjagata Vata*,*Asthi Majjakshaya*,Avascular Necrosis,COVID-19

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INTRODUCTION:

Avascular necrosis (AVN) of the femoral head is a progressive pathological condition resulting from the interruption or occlusion of the blood vessels supplying the bone tissue. This disruption leads to ischemia and subsequent death of bone tissue, compromising the structural integrity of the affected bone. Commonly affecting individuals between the age group of 30 to 50years, AVN is also known by other terms such as osteonecrosis**,** aseptic necrosis, or ischemic necrosis**.** The condition most frequently involves the epiphysis of long bones, with the femoral head being the most commonly affected site due to its unique vascular anatomy and weight-bearing function.

In the early stages, Avascular Necrosis (AVN) is often asymptomatic, making early detection challenging. As the disease progresses, patients typically begin to experience pain, particularly in weight-bearing joints such as the hip. Conventional radiographs may appear normal in the initial phases and are often insufficient for early diagnosis. Magnetic Resonance Imaging (MRI) is considered the most sensitive and specific imaging modality for detecting early changes in AVN. In advanced stages, MRI may reveal the characteristic "crescent sign," which indicates subchondral fracture, flattening of the articular surface, and narrowing of the joint space hallmarks of progressive joint degeneration.[1]

The exact pathogenesis of avascular necrosis (AVN) is not fully understood, but it is believed to involve a combination of traumatic and non-traumatic factors that compromise the blood supply to the bone. This vascular disruption leads to the death of osteocytes and trabeculae, ultimately resulting in the collapse of the necrotic bone segment. Traumatic causes commonly include femoral neck fractures and hip dislocations, which can disrupt the vascular supply to the femoral head by displacing it from the acetabulum.[2] On the other hand, non-traumatic causes are more systemic and multifactorial. These include excessive alcohol intake, prolonged or high-dose corticosteroid use, smoking, sickle cell disease, coagulopathies, chronic inflammatory disorders, and certain infections such as HIV, tuberculosis, and meningococcal infections.[3]

Similarly, in Ayurveda, Avascular Necrosis (AVN) can be correlated with the condition known as *Asthi-Majjagata Vata*, based on the similarity in clinical presentation. This condition arises due to the vitiation of *Vata dosha* affecting the *Asthi* (bone) and *Majja* (bone marrow) *Dhatus*. The classical signs and symptoms of *Asthi-Majjagata Vata* include*: Bhedo-asthi-parvanam* (breaking or piercing pain in bones and joints)*, Sandhishoola* (joint pain), *Mamsakshaya* (muscle wasting), *Balakshaya* (generalized weakness), *Sandhi Shaithilya* (laxity or instability of joints), *Aswapanasantatru* (sleeplessness due to continuous pain), and *Shiryanti iva asthinidurbalani* (degeneration and weakening of bones leading to fragility and fatigue).[4]

Ayurveda offers a wide array of treatment modalities for such conditions, focusing on pacifying *Vata dosha*, nourishing the *Asthi dhatu*, and strengthening the musculoskeletal system. Therapies such as *Snehana* (oleation), *Swedana* (sudation), *Basti* (medicated enemas), and *Rasayana* (rejuvenation therapies) have been traditionally used to manage symptoms and improve the quality of life in conditions resembling AVN.

CASE HISTORY:

This case reports a 38-year old male, non-diabetic and non-hypertensive who presented with pain in bilateral hip joint along with reduced movement of hip joint and also having moderate limping of right lower limb since 2 and half months. The pain was not of radiating type in the beginning. Gradually it aggravated and started radiating along thigh to knee joint in right side. Relieving factors included rest and warm poultice.

There were no associated complaints such as burning sensation or numbness. Transient relief was seen after taking steroid for one year. Recurrence and intensified pain was appeared after one and half years. His condition gradually worsened and he was advised for core decompression. which the patient refused and instead sought Ayurvedic treatment for the same. History of Patient : The patient had a history of COVID-19 infection in April 2021 and received steroid therapy for three months. There is no significant family history. The patient follows a mixed diet with reduced appetite, regular bowel movements, and disturbed sleep due to pain. No addictions or allergies are reported.

General Examination- Systematic Examination

On general and systemic examination, the patient is conscious and oriented to time, place, person, and things. Pallor, icterus, clubbing, and lymphadenopathy are absent. Temperature is 98.6°F, pulse rate 80 bpm, and blood pressure 130/80 mmHg. Cardiovascular, respiratory, and abdominal examinations are normal with no abnormal findings.

Assessment Criteria:

The range of the movement of the hip joint i.e., Adduction, Abduction, Flexion, Extension, Internal rotation, External rotation was measured. [Table No. 10] Assessment was done on the basis of subjective parameters. [Table No.9] Assessment was done on the basis of subjective criteria, signs and symptoms.

Treatment Plan

This diagnosed case of Avascular necrosis of the femoral head was admitted to the male general ward of Vaidyaratnam P.S. Varier Ayurveda College, Kottakkal, Kerala with IPD,no. 20231057 and undergo the following procedures.

Oral Ayurveda medicines were administered in the patient. The details are mentioned in table-8

Table-1: *Aaturabala pramana pariksha* (examination of the strength of the patient)

Prakriti(body constitution)	*Kaphapitta*
Sara(quality of tissue)	*Meda,mamsa*
Samhanana(body built)	*Madhyamam*
Pramana (anthropometry)	Weight-70kg,height-160cm
Satmya(adaptability)	*Sarvarasam*
Satva(mental strength)	*Madhyamam*
Aharashakti(food intake and digestion capacity)	*Ahbyavaharana-madhyamam* *Jaranam-madhyamam*
Vyayamashakti(exercise capacity)	*Avara* –poor
Vaya(age)	*Yuvavastha(*adult*)*
Desha(habitat)	*Sadharanam*

Table-2: *Asthavidha pariksha* (Eight-Fold Examination)

Nadi (pulse)	76b/min, regular
Mutra (urine)	*Peetham*
Mala (stool)	*Abadham*
Jihva (tongue)	*Arunam*
Shabda (sound)	*Spashtam*
Sparsha (touch)	*Anushnasheetam*
Drik (eye)	*Anavilam*
Aakriti (built)	*Madhyamam*

Table-3: Local Musculoskeletal Examination – Hip and Lower Limb

Parameters	**Right Side**	**Left Side**	**Remarks/ Interpretation**
Inspection	-Limping gait present -Apparent shortening (1 cm) - No muscle atrophy	Normal	Patient bends toward right side while standing or walking due to limb shortening
Palpation	Tenderness present over right hip joint and gluteal region	Mild tenderness	Indicates local inflammation and pain in right hip
Measurements	Apparent length – 95 cm True length – 100 cm Intermalleolar distance – 41.5 cm	Apparent length – 96 cm True length – 101 cm	Confirms right limb shortening by 1 cm
Range of Motion (ROM)	Flexion -90 Extension-10 Adduction-20 Internal rotation-10 External rotation-20	Flexion –100 Extension-10 Adduction-30 Internal rotation-20 External rotation-40	Suggests advanced joint involvement (right)
Muscle Strength (Grade 0–5)	Hip muscles – 3/5 (movement against gravity, not resistance)	5/5 (normal strength)	Mild to moderate weakness in right hip muscles due to disuse/pain
Gait	Limping gait due to right limb shortening	Normal	Functional disability due to pain and shortening
Lumbar Spine Movement	Restricted, especially lateral flexion due to pain	Normal	Pain radiates during spinal movement
Straight Leg Raise Test	Positive – pain in right hip with anterior thigh stretch	Negative	Indicates hip joint pathology rather than nerve root compression
Neurological Examination	Reflexes and sensations normal	Reflexes and sensations normal	No neurological deficit

Table-4: Investigations:

Investigation	Findings
X-ray (Both Hip Joints)	- Right hip joint space reduced with multiple osteophyte formations. - Right femoral head mildly deformed with sclerotic changes.
MRI (Pelvis – Both Hips) dated 10-06-2023	Impression (Figure 1): • Ficat and Arlet stage III AVN of right hip involving the femoral head with mild subchondral collapse. • Moderate marrow oedema in the rest of the right femoral head and neck. • Ficat and Arlet stage II AVN of left hip involving the antero-medio-superior aspect of the femoral head, with no collapse. • Mild right and minimal left hip joint effusion.

Table-5: Details of Blood Investigations: dated 10-06-23

Investigations	Result
Anti CCP	Negative
HLA-B27	Negative
Blood Sugar Random	80mg/dl
C.R. P	1.9
Lipid Profile Total cholesterol HDL LDL VLDL TRIGLYCERIDES	 130mg/dl 49mg/dl 61mg/dl 20mg/dl 100mg/dl
ESR	20mm/hr

Table- 6: Grading of subjective parameters

Symptoms	Criteria	Grade
Pain	No pain while walking Mild Pain while walking Moderate Pain while walking Severe pain while walking	0 1 2 3
Stiffness	No stiffness Stiffness for 10 - 30 min Stiffness for 30 - 60 min Stiffness for more than 1 hr	0 1 2 3
Movement of joints	Normal Mildly restricted Moderately restricted	0 1 2

	Severely restricted	3
Radiating pain	Pain never radiates Occasionally radiating Mostly radiating Radiating all the time	0 1 2 3
Gait	Unchanged Occasionally changed Walk with support Unable to walk	0 1 2 3
Sleep	Normal Occasionally disturbed Frequently disturbed Unable to sleep due to pain	0 1 2 3

Table-7: Therapeutic intervention

Date	**Procedure**	**Drugs used**	**Quantity**	**Duration**
22/06/ 23 to 24/06/23	*Takrapanam*	*Takram* *Brihat vaiswanara choornam*	1litre- 1st day 1.5 Litre-2nd day 2litre-3rd day 30gms	03 days
25/06/ 23 to 27/06/23	*Udvarthanam (sarvangam)*	*Yavakolakulathadi churnam*		03days
26/06/ 23 to 30/06/23	*snehapanam*	*Guggulutikthakam ghritam.*	1st day-30ml 2nd day-50ml 3rd day-100ml 4th day-125ml 5th day-150ml	5days
25/06/ 23 onwards	*Avagaham*	*Vataharapatra*		Next 10days

1/07/ 23 to 3/07/ 23	*Abhyangam*	*Murivenna*		3 days
4/07/23	*Virechanam*	*Nimbhamrutherandam*	20ml	1day
05/07/ 23 to 09/07/23	*Shashtikapindasweda*	✔ Shashtikam ✔ Panchatikthakam Kashaya choornam ✔ Milk ✔ Murivenna ✔ Panchatikthakam ksheera kashayam	200gms 200gms 1.5 litre 200ml 50ml	5days
05/07/23 to 09/07/23	*Ksheeravasthi*	✔ *Guggulutikthakam tailam* ✔ *Honey* ✔ *Saindhavam* ✔ *Guggulutikathakam ghritam* ✔ *Panchatikthakam ksheerakashayam*	120ml 120ml 5gm 120ml 240ml	5days
10/07/23 to12/07/23	*Snehapanam*	*Guggulutikthakam ghritam*	100ml	3 days
13/07/23	*Abhyangam and Ushmaswedam*	Murivenna		1 day
14/07/23	*Jalookavacharanam*		10 Jalooka	1 day

Table -8: Details of oral medications administered:

Drug	**Dose**	***Anupana***	**Time**	**Duration**
Dashamoola Kwatha	10 ml	Luke warm water	After food TDS	3weeks
Kaishora guggulu	500mg	Luke warm water	After food BD	3weeks
Avipatti choorna	5mg	Luke warm water	Empty stomach early morning OD	3weeks

Table- 9: Assessment of subjective parameter before and after treatment

Symptoms	**Before treatment**	**After 10 days of t/t**	**After 21 days of t/t**
Pain	3	2	0
Radiating pain	3	1	0

Stiffness	2	1	0
Movement of joints	2	1	1
Gait	2	1	0
Sleep	3	1	0
Trendelenberg Sign	Positive	Improved	Improved

Table-10: Observation in Range of Movement of Hip Joint using goniometre

Range of motion	**Right/left leg**	**Before treatment ROM**	**After treatment ROM**
Adduction (20°-50°)	Right Leg	20	25
	Left Leg	30	40
Flexion (110°-120°)	Right Leg	90	100
	Left Leg	100	120
Extension (10°-15°)	Right Leg	10	10
	Left Leg	10	15
Internal rotation (30°-40°)	Right Leg	10	20
	Left Leg	20	30
External Rotation (40°60°)	Right Leg	20	30
	Left Leg	40	50

Table -11: Advice on discharge

Drugs	**Dose**	**Time**	**Duration**
• *Panchatikthakam kheera kwatha* • Gandhatailam • Asthisamhara choornam	60ml 5ml 1tsp	After food BD	4weeks
Guggulu tikthakam ghritam	10ml	10am	4weeks
Balaaswagandhadi tailam		External application during bath	4weeks

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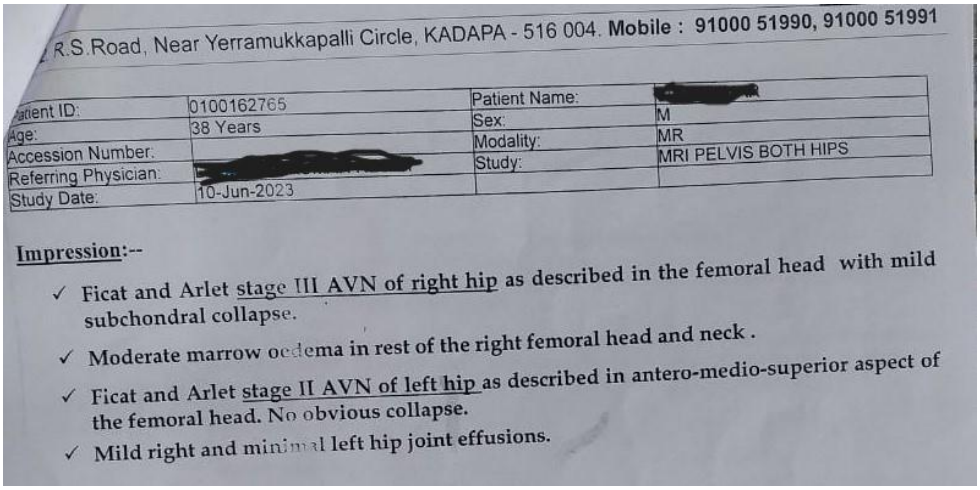


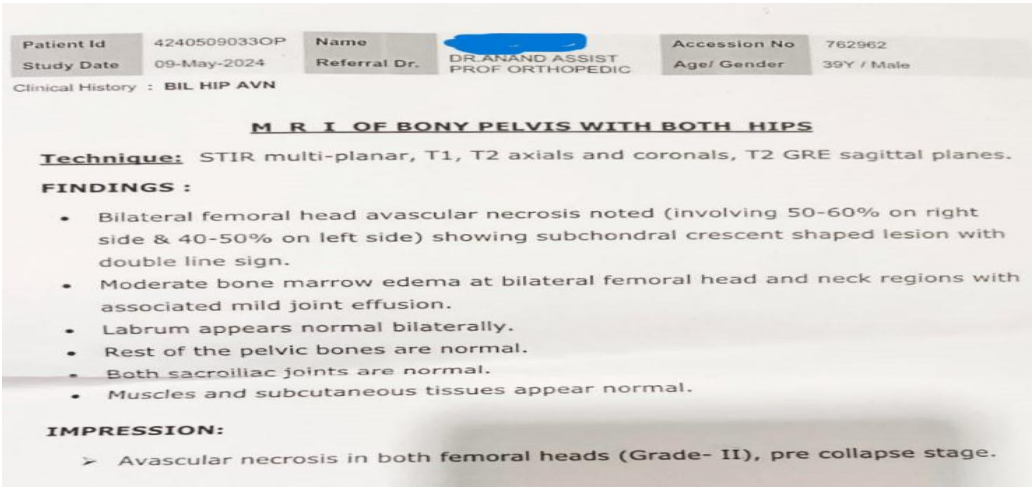
R.S.Road, Near Yerramukkapalli Circle, KADAPA - 516 004. Mobile : 91000 51990, 91000 51991

Patient ID:	0100162765	Patient Name:	[redacted]
Age:	38 Years	Sex:	M
Accession Number:		Modality:	MR
Referring Physician:	[redacted]	Study:	MRI PELVIS BOTH HIPS
Study Date:	10-Jun-2023		

Impression:--

- ✓ Ficat and Arlet stage III AVN of right hip as described in the femoral head with mild subchondral collapse.
- ✓ Moderate marrow oedema in rest of the right femoral head and neck .
- ✓ Ficat and Arlet stage II AVN of left hip as described in antero-medio-superior aspect of the femoral head. No obvious collapse.
- ✓ Mild right and minimal left hip joint effusions.

Figure-1: MRI Pelvis (Both Hips) dated 10-06-2023 showing features of bilateral Avascular Necrosis -Stage III (right hip) and Stage II (left hip)



Patient Id	4240509033OP	Name	[redacted]	Accession No	762962
Study Date	09-May-2024	Referral Dr.	DR.ANAND ASSIST PROF ORTHOPEDIC	Age/ Gender	39Y / Male

Clinical History : BIL HIP AVN

M R I OF BONY PELVIS WITH BOTH HIPS

Technique: STIR multi-planar, T1, T2 axials and coronals, T2 GRE sagittal planes.

FINDINGS :

- Bilateral femoral head avascular necrosis noted (involving 50-60% on right side & 40-50% on left side) showing subchondral crescent shaped lesion with double line sign.
- Moderate bone marrow edema at bilateral femoral head and neck regions with associated mild joint effusion.
- Labrum appears normal bilaterally.
- Rest of the pelvic bones are normal.
- Both sacroiliac joints are normal.
- Muscles and subcutaneous tissues appear normal.

IMPRESSION:

➢ Avascular necrosis in both femoral heads (Grade- II), pre collapse stage.

Figure-2: MRI Pelvis (Both Hips) dated 09-05-2024 showing features of bilateral Avascular Necrosis- Stage II (right hip) and Stage II (left hip).

FOLLOW UP:

After 28 days, the patient was reassessed and showed sustained improvement. Discharge medications were advised to be continued for the next six months. Follow-up MRI scans of both hips taken after one year indicated that disease progression had halted in the left hip, while the right hip had improved from grade 3 to grade 2.

MRI Pelvis (Both Hips) dated 09-05-2024 showing features of bilateral Avascular Necrosis — Stage II (right hip) and Stage II (left hip).

DISCUSSION:

Avascular necrosis (AVN) is characterized by the cellular death of bone components due to the interruption of blood supply, ultimately causing collapse of the bone, resulting in pain, loss of joint function, and eventual damage to the joint.[5] AVN may arise from both traumatic and non-traumatic causes. Among the non-traumatic factors,

corticosteroid usage, alcoholism, infections, storage disorders, coagulation defects, and certain autoimmune diseases have been identified as contributing causes.[6]

Steroid-induced avascular necrosis (AVN) occurs due to a combination of vascular, metabolic, and cellular disturbances that lead to bone ischemia and necrosis. Glucocorticoids promote fat embolism and marrow fat cell hypertrophy, increasing intraosseous pressure and reducing blood flow. They also cause endothelial dysfunction through reduced nitric oxide production, osteocyte and osteoblast apoptosis, and a shift of mesenchymal stem cells toward adipogenesis instead of osteogenesis. These effects collectively impair bone remodeling and repair, leading to subchondral ischemia, necrosis, and eventual bone collapse most commonly in the femoral head.[7]

From an Ayurvedic perspective, although there is no direct reference to AVN in classical texts, its clinical manifestations suggest a vitiation of *Vata Dosha* and consequent *Asthi Dhatu kshaya*. In cases such as AVN of the femoral head, there is a reduction in blood supply due to *Mārgāvarodha* or *Abhighāta*, ultimately leading to necrosis. Both *Mārgāvarodha* and *Abhighāta* are known to aggravate *Vata Dosha*, which further leads to degeneration or loss of *Asthi Dhatu*. When *Vata* becomes excessively aggravated, it starts to damage the very tissue it inhabits. It leaves its natural location and, through its own inherent qualities such as dryness, lightness, and roughness begins to deplete and weaken the bone tissue. This explains why conditions of aggravated *Vata* often lead to bone-related disorders, such as osteoporosis, joint degeneration, and low bone density, dries out the *Asthi dhatu*.[8]

The general treatment principles for *Vata* disorders include *Snehana* (oleation), *Swedana* (sudation), and *Sneha virechana*.[9] However, in the case of Avascular Necrosis (AVN), there is *Kshaya* (depletion) of *Asthi Dhatu* (bone tissue). In the management of Post-COVID steroid-induced avascular necrosis, Ayurvedic treatment aims to pacify *Vata Dosha* and restore tissue vitality through combined *Shamana* and *Shodana* approaches. *Tikta Rasa*-predominant *Ksheera* and *Ghrita* preparations are used for their *Vata-Shamana*, *Rakta-Prasadana*, and *Asthi-Dhatu-Poshana* actions, improving microcirculation and promoting bone regeneration. *Ksheera Basti* serves as the principal *Shodana* therapy, targeting the *Pakvashaya* the main site of *Vata* to alleviate systemic vitiation and enhance local nourishment. For localized purification, *Jalookavacharana* (leech therapy) is employed to remove stagnant blood, reduce inflammation, and improve local perfusion through the anticoagulant and vasodilatory effects of leech saliva. Together, these therapies holistically correct ischemia, restore lipid metabolism, and rejuvenate bone tissue.

To promote regeneration of *Asthi Dhatu*, the treatment should include *Dravyas* having the qualities of *Snigdha, Soshana*, and *Kharatva*. However, such combinations of properties are not readily available in natural substances, as *Snigdha* and *Soshana* are opposing qualities. Therefore, formulations must be prepared using specific *Samskaras* to get the desired qualities.[10]

For the *Soshana* , *Tikta rasa dravyas* are chosen. These are predominantly composed of Vayu and *Akasha Mahabhutas*, and their *Bhuta* constituent aligns with *Vata Dosha*, thereby exacerbating bone porosity if used excessively.[11] To counter this, *Madhura Rasa* (sweet taste) substances, which are

predominantly composed of *Prithvi* and *Jala Mahabhutas*, act as supplements to nourish and rebuild *Asthi Dhatu*. Thus, *Madhura Rasa Bhuta Khatana* supports the restoration of bone tissue and helps balance the aggravated *Vata*. *Ghrita* is known to pacify *Vata*, and possesses *Madhura Rasa* and *Shita Virya*. It aids in *Vata Shamana*, supports *Dhatu Upachaya*, and serves as a *Rasayana*. Furthermore, *Ghrita* holds the property of *Sanskarasya Anuvartana*, meaning it can inherit and carry the properties of other substances without undergoing any change itself, thereby enhancing the bioavailability of the ingredients it is processed with.[12]rThis contributes to *Samprapti Vighatana* in conditions such as *Asthi Kshaya*.

Before administering *Brimhana, Langhana* should be performed. For this purpose,*virechana* with *Nimbamriterandam* is used. *Nimba (Azadirachta indica)*, which is *Tikta Rasa* predominant, is often employed. *Nimbaamritadi eranda taila* was used for *Virechana*.The purpose was to perform *Snigdha virechana* considering *Vata* predominant nature of disease and involvement of *Asthi dhatu* that have *Ruksha* and *Kharaguna*. Besides, *Eranda taila* is said to act on *Vatadosha* and when it is processed along with *Tikta rasa dravyas* like *Nimba* and *Guduchi;* act on *Asth dhatu*.[13] This helps in cleansing the channels and reducing aggravated *Doshas*,thereby preparing the body for effective *Brimhana* therapy. Before every *shodana* procedure proper *rukshana* followed by *snehana* and *swedana* is done.

As a *Poorva karma* for *Panchakarma* procedure *Swedana* is done by *Shashtika Shali Pinda Sweda* is a nourishing (*Brimhana*), *Vata*-pacifying (*Vatahara*), and external *Swedana* (sudation) therapy. It utilizes key ingredients such as *Shashtika Shali* and cow's milk, which help strengthen and rejuvenate muscle tissues.milk prepared with *Panchatikthaka kashaya choornam*. These ingredients are prepared into a bolus (*Pottali*), which is then dipped in *Panchatikthaka Ksheera Kashayam* and massaged over the body. Clinical observations have shown that this treatment effectively reduces muscle stiffness, improves tissue extensibility, and enhances the range of motion in affected areas.

As a *Shodana* therapy In this context, *Basti* emerges as the preferred treatment among *Panchakarma* procedures, as it is the primary therapy for pacifying *Vata Dosha*.[11]rThe condition, considering its signs, symptoms, doshic involvement, and *dhatu* deterioration, aligns with the pathology of *Asthi-Majjāgata Vāta Vikāra*.[14]

Bone-degenerative conditions (*Asthikshaya*) should be treated with bitter (*Tikta rasa*) *dravyas* mixed with milk and ghee, and through *Basti* (enema) therapies also containing *tiktharasa dravyas*. Though *Tikta* increases *Vata*, its use is justified here because, when combined with milk and ghee, it provides both nourishment (*Snigdha*) and the necessary roughness (*Khara*) that stimulates bone growth. Since no single substance is both nourishing and drying, this combination is recommended. *Asthi-Majjāgata Vāta, Kṣhīra Basti* was planned. The *Pañchatiktaka Kwatha*, used in this therapy, is primarily *Tikta* and *Katu Rasa* dominant.[14]

The decoction prepared in *Ksheera* (milk), possessing *Madhura* (sweet) and *Snigdha* (unctuous) properties, is effective in pacifying *Vata Dosha*. Due to the *Sukshma Guna* of *Saindhava* (rock salt), it penetrates the micro-channels of the body and facilitates improved blood supply to the bone tissue.[14]

In this *Basti* formulation, *Tikta Dravyas* exhibit *Tikta Rasa*, *Ushna Virya*, and *Madhura* and *Katu Vipaka* , which support the normal functioning of *Dhatvagni*, thereby enhancing the nourishment of *Asthi Dhatu*. For Localised *Shodana* we are selecting *Jalaukavacharana* (leech therapy) plays a supportive role in the management of Avascular Necrosis (AVN) of the hip by enhancing local blood circulation, reducing inflammation, and relieving pain.[15] Before doing this again *Snehana* and *Swedana* is done as a *Poorvakarma* for *Rakthamoksha* procedure.In this case for localised *Shodana Jalookavacharana* is done.According to Ayurvedic principles. Leech saliva contains bioactive substances such as hirudin, calin, and vasodilators, which help improve microvascular perfusion, and exhibit anti-inflammatory and analgesic properties. This therapy is especially useful in early stages (Stage I–II) of AVN to potentially delay progression and improve joint function.

CONCLUSION:

In the contemporary science there is no conservative management which gives permanent cure for Avascular Necrosis (AVN), and joint replacement remains the final treatment option, though it comes with its own limitations. However, this case demonstrates a positive outcome, particularly in terms of improved range of motion, from the MRI 3 to 2 which helps prevent further deterioration and enhances the functional capacity of the affected bone. The treatment provided was non-invasive and cost-effective through Ayurvedic treatment protocol significant role in halting disease progression and preventing complications is possible. Following the treatment, the patient was able to resume normal daily activities with ease, and the outcomes were encouraging. Further research involving a larger sample size is needed to establish a standardized Ayurvedic treatment protocol for managing AVN of the femoral head and monitoring disease progression.

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