

# Ayurvedic management of Asthimajja gata vata w.s.r to AVN of head of femur – A case study

## Case Report

**Dash G<sup>1</sup>, Dinesh Patil<sup>2</sup>, Parappagoudra M<sup>3\*</sup>, Anjali G<sup>4</sup>**

1. PG scholar, 2. Associate Professor, 3. Associate Professor, 4. PG Scholar, Department of Panchakarma, Parul University, Parul Institute of Ayurveda, Vadodara, Gujarat, India.

### Abstract

Avascular necrosis (AVN) of the bone is a condition characterized by the death or necrosis of bone tissue, accompanied by structural changes. It is also referred to as osteonecrosis or ischemic necrosis of the bone. It is mostly seen in patients having a history of excessive alcohol and high-dose steroid medications. In the initial stage, it is painless but as the disease progresses there is a gradual increase in pain which affects the patient's daily routine as well as his lifestyle. It is the most challenging condition in orthopaedics. The available treatments in modern medicine for this condition are not considered satisfactory in the current era. Here we present a case of Avascular Necrosis (AVN) of the Femoral Head that was treated with Panchakarma procedures, including *Udvaartana*, *Abhyanga*, *Swedana*, *Basti karma*, *Raktamokshana*, and Physiotherapy exercise. In *Ayurveda*, AVN Head of Femur can be co-related to *Asthi Majjagata Vata*, based on similar signs and symptoms. Marked improvements were observed in terms of pain reduction, range of motion, and overall quality of life. The study shows that Avascular Necrosis of the Femoral head may be successfully managed with *Panchakarma* treatment, *Shaman chikitsa*, and Physiotherapy Exercises.

**Keywords:** Avascular necrosis (AVN), *Asthi-Majjagata Vata*, *Panchakarma*, *Basti karma*, Physiotherapy.

### Introduction

Avascular necrosis (AVN), is osteonecrosis (dead bone) and is additionally called Osteonecrosis/Aseptic necrosis/Ischemic bone disease (1). The epiphysis of the long bones is typically impacted, with the femur being the most frequently affected bone. AVN can be a traumatic or non-traumatic injury by which there is an interruption in the blood supply to the bone. In the early stages, a patient usually does not have symptoms, but as the disease progresses, it becomes painful. In the beginning stages, AVN may not be visible on a regular X-ray, and the most accurate way to diagnose it is through an MRI. As the disease advances, the MRI can detect a characteristic "crescent sign," which shows the flattening of the joint surface and a decrease in the joint space (2). To treat this condition, various surgical procedures are performed, such as drilling, bone grafting, modified Whitman or Colonna reconstruction, and implantation of a prosthesis (3). AVN of the femoral head is also classified mainly into 2 types: 1) Post-traumatic and 2) Idiopathic. The arteries that supply the femoral head area are very tiny and thus the area is simply susceptible to injury followed by mere

dislocation or a sub-capital fracture (near the head) of the femur (4).

It may include a variety of non-traumatic causes like intake of excess alcohol, high-dose corticosteroids, smoking, trauma, sickle cell disease, coagulopathy, chronic inflammatory disease, and infections such as human immunodeficiency virus (HIV), tuberculosis, meningococcal infections (5).

However, it may be asymptomatic at the initial phase but at a later stage, delicate to severe pain especially groin pain that radiates down towards the anteromedial thigh is seen with the change in the gait as well as the change in the range of motion i.e., abduction, adduction, flexion, and extension are found.

According to *Ayurveda*, AVN is co-related to *Asthi-majjagata vata* due to similar signs and symptoms (6). The signs and symptoms of *Asthi-majjagata vata* are *Bhedoasthiparvanam* (breaking type of pain in bones), *Sandhishoola* (joint pain), *Mamnsakshaya* (muscular wasting), *Balakshaya* (weakness), *Sandhi Shaiithilayam* (laxity of joints), *Aswapanasantatruka* (sleeplessness due to continuous pain) and *Shiryantiva cha Asthinidurbalani* (destruction of bony tissue causing generalized weakness) (7). According to *Ayurveda*, AVN is co-related to *Asthi-majjagata vata* due to the similar sign and symptoms. In *Ayurveda* wide range of treatment modalities has been mentioned for *Asthi-majjagata vata*. We are presenting a case that was effectively treated using Ayurvedic methods for managing Vata Vyadhi.

#### \* Corresponding Author:

**Mahesh Parappagoudra**

Associate Professor,  
Department of Panchakarma, Parul University,  
Parul Institute of Ayurveda,  
Vadodara, Gujarat, India.

Email Id: [mahesh.parappagoudra26812@paruluniversity.ac.in](mailto:mahesh.parappagoudra26812@paruluniversity.ac.in)

## Case report

Patient information: Age: 31Y, Sex: Male, Religion: Hindu, Occupation: Manager in a Pharma Company (desk job).

### Chief complaints:

- Pain at the bilateral hip joint radiating to both legs since 1 month
- Difficulty in walking and prolonged standing for 1 month
- Morning stiffness since 1 month

### Case study

A 31-year-old male patient came to the OPD of *Panchakarma* just after recovery from COVID with the above-mentioned complaints.

### Present illness

The patient was healthy 2 months ago, 1 month before he tested positive for COVID. He was admitted to an allopathy hospital and was given steroids as per their standard treatment protocol. After discharge from the hospital, he developed weakness and mild pain in the bilateral hip joint while standing and walking. Despite taking painkillers, the pain did not subside and continued to worsen day by day. The patient continued to take painkillers, which provided some relief initially, but after three days of continuous use, the pain did not completely subside. Instead, the patient's gait gradually changed and the pain severity increased. The pain was associated with morning stiffness which required 10-15 minutes to stand up from the bed daily in the morning time. He consulted an Orthopaedic specialist due to the severe pain, and the doctor advised an MRI along with some routine investigations. The MRI results revealed stage II avascular necrosis of the bilateral femoral heads, and the patient was advised to undergo surgical intervention. However, the patient was not willing to undergo the surgical intervention recommended by the orthopaedic doctor. Therefore, he approached our *Panchakarma* OPD at Parul Ayurved Hospital, Vadodara, Gujarat, for further treatment. The patient was previously diagnosed with AVN (Avascular necrosis) stage-II of the femoral head having complaints of pain in the bilateral hip joint with reduced movement, difficulty in walking, and morning stiffness in the past 1 month. The pain was continuous and radiating to bilateral legs with an abnormal limping gait. The pain increases in mild walking or standing for a few minutes and doing daily routine activities. The patient was advised to get IPD admission and was treated with *Panchakarma* treatments along with oral medicines i.e., *Shamana Chikitsa* and some Physiotherapy exercises.

### Personal history

- Addiction- No such Diet- Mix
- Appetite- Normal Micturition- Normal
- Bowel- (Hard Stool) Not clear Height- 5'6"
- Weight- 65 KG
- Sleep- Disturbed due to pain

### On examination

- General condition- Moderate, Afebrile
- Pulse rate-77/min
- B.P.-130/80 mm of Hg
- R.R.-17/min

### Local examination:

1. Tenderness was present in both hip regions.
2. There was a marked loss in the range of movements with a limping gait.
3. Measurement of lower limbs:
  1. Apparent length:
    - Right leg: 88cm
    - Left leg: 87 cm
  2. True length:
    - Right leg: 93cm
    - Left leg: 91cm
  3. Inter malleolar length: 42.5cm

### Astha vidha pariksha

1	Nadi (pulse)	77/Minute, Regular
2	Mutra (urine)	Samyaka
3	Mala (stool)	Samyaka
4	Jivha (tongue)	Sama
5	Shabda (sound)	Spashta
6	Sparsha (touch)	Samsheetoshna
7	Drika (eye)	Samanya
8	Aakriti (built)	Madhayama

### Samprati Ghatak

- Dosh- Vata-Kaphaj
- Dushya- Rasa, Rakta, Mamsa, Asthi.
- Srotas- Rasavaha, Raktavaha, Mamsavaha, Asthivaha.
- Srotodushti- Sanga.
- Udbhava Sthana- Pakwashaya.
- Vyakta Sthana- Kati Sakti pradesha.

### Investigation

MRI shows features of avascular necrosis involving bilateral femoral heads without significant cortical collapse- Ficat and Arlet stage II on both sides.

### Assessment criteria

1. Range of movement (Abduction, Adduction, Extension, Flexion, Internal rotation, and external rotation) of the hip joint was measured by Goniometer.
2. Visual Analogue scale was used to access the pain intensity.
3. Harris Hip Score was used to access the quality of life of patient.

### Treatment plan

According to the involvement of *Dosha Dushya* and the General Examination of the patient, the below treatment protocol was planned.

- Panchakarma OPD based oral medications for 5 days
- Panchakarma IPD-based treatment for 16 days.

**Table 3: OPD Based Treatment**

Sr. No.	Drug	Dose	Anupana		Time		Duration
1	<i>Rasnadi Guggulu</i>	2 tab	Luke water	warm	Before TDS	food	5 days
2	<i>Amapachaka vati</i>	2 tab	Luke water	warm	Before TDS	food	5 days
3	<i>Eranda bhrusta haritaki</i>	2 tab	Luke water	warm	Before BD	food	5 days

**Table 4: IPD Based Shamana Chikitsa (Table 4)**

Sr. No.	Drug	Dose	Anupana		Time		Duration
1	<i>Asthiposhaka vati</i>	2 tab	Luke water	warm	After TDS	food	Day 1-16
2	<i>Panchatikta guggulu ghrita</i>	2 tab	Luke water	warm	After TDS	food	Day 1-16
3	<i>Panchatikta Ksheerapaka</i>	80ml	-		After BD	food	Day 5-16
4	<i>Cap Rasayana lasuna</i>	4 tab 8 tab 12 tab	Luke milk	warm	Before OD	food	Day 8-10 Day 11-13

**Table 5: Panchakarma Procedures (Table 5)**

1	<i>Sarvanga Udvartana with Yava Churna, Triphala Churna</i>	Day 1-4
2	<i>Sarvanga Pariseka with Dhanyamla</i>	Day 1-8
3	<i>Stanika Lepa with Doshagnha, Guduci, Rashna and Triphala churna</i>	Day 1-4
4	<i>Sarvanga Abhyanga with Dashmoola Taila</i>	Day 5- 11
5	<i>Patra pinda sweda with Nirgundi patra, Arka patra, Eranda Patra, Lemon, Harida, Grated Coconut, Dashmula taila</i>	Day 9- 11
6	<i>Sarvanga abhyanga with Bala ashwagandha tail</i>	Day 12-16
7	<i>Shali shastika pinda sweada with Shali Sastika rice Milk, Balamoola kashaya</i>	Day 12-16
8	<b>Panchatikta Sodhana Basti</b> <b>Anuvasana basti</b> <i>Guggulu Tikta Ghrita :60ml</i> <i>Kasisadi Taila: 20ml</i> <b>Niruha Basti</b> <i>Honey- 100ml</i> <i>Lavana- 10gm</i> <i>Guggulu tikta ghrita-60ml</i> <i>Kasisadi taila-20ml</i> <i>Putoyavani kalka-30gm</i> <i>Go mutra-60ml</i>	Day5 -8 <i>Anuvasana Basti -3</i> <i>Niruha basti- 3</i>
9	<b>Manjistadi Kshara Basti</b> <b>Anuvasana basti</b> <i>Manjistadi taila:40ml</i> <i>Guggulu tikta Ghrita:40ml</i> <b>Niruha Basti-</b> <i>Honey- 100ml</i> <i>Lavana- 8 gm</i> <i>Sneha: Manjistadi taila- 40ml</i> <i>Kasisadi taila-20ml</i> <i>Guggulu tikta Ghrita-20ml</i> <i>Kalka: Manjista, Satapuspa, Pippali, Vacha, Guduci, Yastimadhu-30gm</i> <i>Yavakshyara - 2gm</i> <b>Kashaya:</b> <i>Manjistadi Kashaya - 200ml</i> <i>Rashnadi Kashaya-50ml</i> <i>Gomutra-50ml</i>	Day 9-11 <i>Anuvasana basti- 1</i> <i>Niruha basti- 3</i>
10	<b>Panchatikta ksheera basti</b>	Day 12-16 <i>Anuvasana basti- 6</i> <i>Niruha basti- 5</i>
11	<i>Physiotherapy Exercise</i>	

### Observations

Pain was assessed using VAS scale score i.e, 0-10. VAS scale score was 7 in right leg and 6 in left leg which came down to 3 and 1 respectively after the treatment.

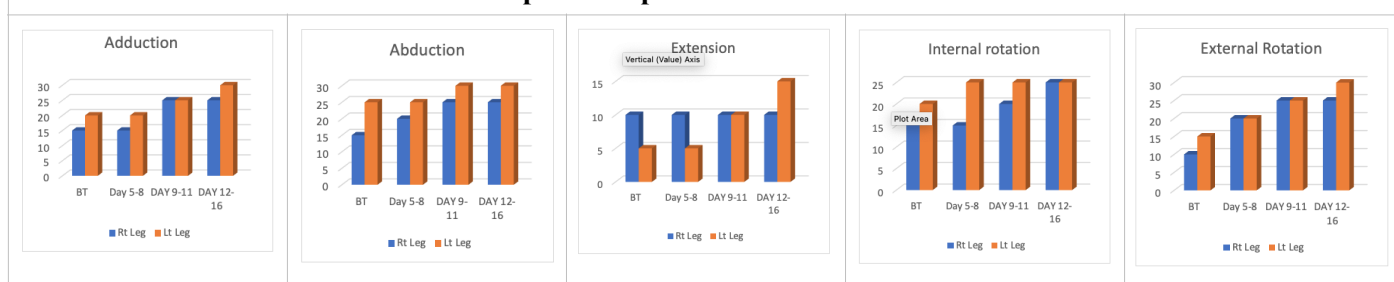
Assessment of the range of movement of the hip joint was done before treatment and after *Sarvanga*

*Abhyanga* followed by *Sarvanga Pariseka* and *Panchatikta Sodhana Basti* (day 5-8); after completion of *Sarvanga Abhyanga* followed by *Patra pinda sweda* and *Manjistadi Kshyara Basti* (day 9-11); after completion of *Sarvanga Abhyanga* followed by *Sali sastika pinda sweda* along with *Panchatikta ksheera basti* (day 12-16) are shown in table no.6.

**Table 6: Observation of Range of movement of hip joint**

Range of Movement		Before Treatment (In Degree)	AT1 (Day 5-8)	AT2 (DAY 9-11)	AT3 (DAY 12-16)
			Sarvanga Abhyanga followed by Sarvanga Pariseka and Panchatikta Sodhana Basti (In Degree)	Sarvanga Abhyanga followed by Patra pinda sweda and Manjistadi Kshara Basti	Sarvanga Abhyanga followed by Sali sastika pinda sweda along with Panchatikta ksheera basti (In Degree)
Abduction (30°- 50°)	Right Leg	15	20	25	25
	Left Leg	25	25	30	30
Adduction (20° - 50°)	Right Leg	15	15	25	25
	Left Leg	20	20	25	30
Flexion (110° -120°)	Right Leg	100	100	105	110
	Left Leg	105	110	110	115
Extension (10° - 15°)	Right Leg	10	10	10	10
	Left Leg	5	5	10	15
Internal rotation (30° - 40°)	Right Leg	15	15	20	25
	Left Leg	20	25	25	25
External Rotation	Right Leg	10	20	25	25
	Left Leg	15	20	25	30

**Table no.7: Graphical Representation of Assessment Criteria**



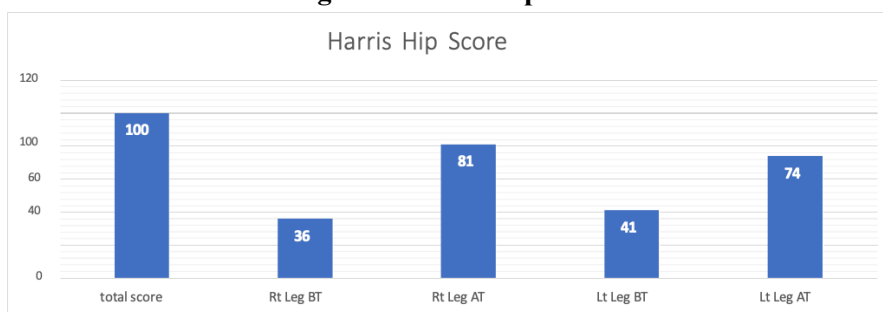
**Table 8: Harris Hip Score (8)**

S.No.	Criteria	Assessment	Right Leg		Left Leg	
			BT	AT	BT	AT
1	Pain	<ul style="list-style-type: none"> <li>None or ignores it (44)</li> <li>Slight, occasional, no compromise in activities (40)</li> <li>Mild pain, no effect on average activities, rarely moderate pain with unusual activity; may take aspirin (30)</li> <li>Moderate Pain, tolerable but makes concession to pain. Some limitation of ordinary activity or work. May require Occasional pain medication stronger than aspirin (20)</li> <li>Marked pain, serious limitation of activities (10)</li> <li>Totally disabled, crippled</li> </ul>	10	40	10	30
2	Limp	<ul style="list-style-type: none"> <li>None(Normal Gait) (11)</li> <li>Slightly limping (8)</li> <li>Moderate limping(5)</li> <li>Severe limping (0)</li> </ul>	0	8	5	11
3	Support	<ul style="list-style-type: none"> <li>None (11)</li> <li>Cane for long walks (7)</li> <li>Cane most of time (5)</li> <li>One crutch (3)</li> <li>Two canes (2)</li> <li>Two crutches or not able to walk (0)</li> </ul>	11	11	11	11

4	Distance Walked	<ul style="list-style-type: none"> <li>Unlimited (11)</li> <li>Six blocks (8)</li> <li>Two or three blocks (5)</li> <li>Indoors only (2)</li> <li>Bed and chair only (0)</li> </ul>	5	8	5	8
5	Sitting	<ul style="list-style-type: none"> <li>Comfortably in ordinary chair for one hour (5)</li> <li>On a high chair for 30 minutes (3)</li> <li>Unable to sit comfortably in any chair (0)</li> </ul>	3	5	3	5
6	Enter public transportation	<ul style="list-style-type: none"> <li>Yes (1)</li> <li>No (0)</li> </ul>	0	0	0	0
7	Stairs	<ul style="list-style-type: none"> <li>Normally without using a railing (4)</li> <li>Normally using a railing (2)</li> <li>In any manner (1)</li> <li>Unable to do stairs (0)</li> </ul>	2	2	2	2
8	Put on Shoes and Socks	<ul style="list-style-type: none"> <li>With ease (4)</li> <li>With difficulty (2)</li> <li>Unable (0)</li> </ul>	2	4	2	4
9	Absence of Deformity (All yes = 4; Less than 4 = 0)	<ul style="list-style-type: none"> <li>Less than 30° fixed flexion contracture <input type="checkbox"/>Yes(1) <input checked="" type="checkbox"/>No(0)</li> <li>Less than 10° fixed abduction <input type="checkbox"/>Yes(1) <input checked="" type="checkbox"/>No(0)</li> <li>Less than 10° fixed internal rotation in extension <input type="checkbox"/>Yes(1) <input checked="" type="checkbox"/>No(0)</li> <li>Limb length discrepancy less than 3.2cm <input type="checkbox"/>Yes (1) <input checked="" type="checkbox"/>No(0)</li> </ul>	0	0	0	0
10	Range of Motion	<ul style="list-style-type: none"> <li>Flexion (*140°)</li> <li>Abduction (*40°)</li> <li>Adduction (*40°)</li> <li>External Rotation (*40°)</li> <li>Internal Rotation (*40°)</li> </ul>	3 0 0 0 0	3 0 0 0 0	3 0 0 0 0	3 0 0 0 0
11	Range of Motion Scale	<ul style="list-style-type: none"> <li>211° -300°(5)</li> <li>161° -210° (4)</li> <li>101° -160°(3)</li> <li>61° - 100(2)</li> <li>31° - 60°(1)</li> <li>0° - 30°(0)</li> </ul>				
Total	100	Total	36 (poor)	81 (good)	41 (poor)	74 (fair)

**Scoring of Harris Hip Score:** < 70 - poor condition of Hip, 70-79 - Fair condition of Hip, 80-89 – Good condition of Hip

**Figure 1: Harris Hip Score**



## Discussion

The basic pathology of AVN of the Femoral Head is most commonly due to occlusion of blood supply at the femoral head. In Avascular Necrosis there will be no signs or symptoms at first, however as the disease progresses, it

can lead to severe pain along with other symptoms like restricted range of moments, stiffness, and difficulty walking. It is essential to seek medical attention earlier to prevent the progression of the disease and to manage symptoms effectively. The initial line of treatment is blood

thinner and lipid-lowering agents, as fat embolism due to increased lipid profile or aggregation of dead red blood cells in sickle cell cases is most commonly found. In this present case there as none of the above factors were involved rather it was due to the use of steroids during the treatment of COVID-19. In Ayurveda, avascular necrosis of the femoral head is correlated with *Asthi-majjagata vata*. The preferred treatment approach for this condition typically includes *Rukshana karma* (therapies that dry out the tissues), *Snehana karma* (therapies that oil and lubricate the tissues), *Swedana karma* (therapies that induce sweating and promote circulation), and *Basti karma* (therapies that involve enemas using medicated oils or decoctions). Additionally, Yoga and an Ayurvedic diet plan may be recommended to support overall health and balance the *doshas*. The combination of these treatments can help to manage symptoms, prevent further damage, and promote healing of the affected tissues. In the present case, there was *Kapha Avruta Vata Dosha*, for which the below treatment protocol was adopted.

#### **Rukshana karma**

Initially, *Rukshana karma* was done through below mentioned *Panchakarma* modalities to remove the *avarana* and to adopt *Basti Karma*.

#### **Udvartana**

*Udvartana* with *Yava* and *Triphala Churna* is a herbal powder massage therapy in which the body is scrubbed with a mixture of powdered herbs and grains. *Yava* (barley) and *Triphala* (a combination of three fruits - *Amalaki*, *Haritaki*, and *Bibhitaki*) *churna* were selected for this treatment as they help to balance *Vata* and *Kapha doshas*, remove excess *Kapha*, and cleanse the channels (*Srotas*) of the body.

#### **Sadyo virechana**

*Snigdha virechana* was prescribed as the *kapha avarana* removed by external therapy, i.e., *Udvartana*; Further, the vitiated *vata dosha* can be treated with *Snigdha Virechana*. As the general treatment protocol of *Vata vyadhi*, *Snigdha Virechana* with *Eranda Taila* was adopted.

#### **Abhyanga**

*Abhyanga* with *Dashmoola taila* was done as *Dashamula* has *Vata Kapha Shamak* property and most of the ingredients have *Vata Kapha Shamak* property. *Dashamula* poses anti-inflammatory and analgesic action (9).

#### **Pariseka**

*Dhanyamla* is highly effective in *vata* associated with *Kapha* or *Ama*. It increases Vasodilation which increases the metabolism as well as the blood supply in that area. The presence of both carbohydrate and oil content in *Dhanyamla* would have been the reason for it having a soothing and mild nourishing effect on using it externally. (10)

#### **Lepa**

*Stanika lepana karma* was done in order to accelerate the action to attain *nirama avastha*.

#### **Basti**

*Erandamuladi Niruha Basti* is a herbal decoction enema that contains *Erandamoola* (*Ricinus communis*) as its main ingredient. *Erandamoola* is considered to be a *Shreshta Vatahara dravya*, which means it is an excellent herb for pacifying *Vata dosha* in the body. It is known to have anti-inflammatory, anti-oxidant, central analgesic, antinociceptive, and bone regeneration properties. (11) *Guggulu tikta ghrita* and *Kasisadi taila* was used in *Anuvasana Basti*. As the main data involved is *Asthi dhatu*, keeping in mind *tikta siddha ghrita* was used, as *tikta rasa siddha basti* is indicated in *Asthi majja gata vata*.

In this condition, *Manjistadi Kshara Basti* was selected as the treatment of choice due to the obstruction in the *Raktavaha Srotas*. *Manjisthadi Kashaya* (12), which contains predominantly bitter and pungent tastes and has a warm potency, serves as a remedy for blood-related disorders and helps balance the three *doshas*. It also alleviates *Kapha* by eliminating blockages, by the help of *Gomutra* and *Yavakshara* in the *Basti*.

*Panchatikta Ksheera Basti* was given to nourish the *Asthi dhatu* (bone tissue). Properties of *Panchatikta gana* drugs are - *Rasa*: Predominant- *Tikta.*, *Anu rasa- Katu* or *kashaya.*, *Vipaka: Katu*; Except *guduchi* (*Madhur vipaka*), *Guna: Ruksha, Laghu*. (13) This *basti* also possesses *Snigdha* (unctuous) *guna*, providing lubricating properties to the herbs used. Furthermore, it promotes strength (*Balya*) and nourishment (*Brimhana*) of *Asthi dhatu*.

#### **Patra pinda sweda**

After the symptoms of *Samyaka Rukshana* (proper drying) (14) and removal of *Avarana* (blockage) were observed, *Patra Pinda Sweda* was adopted. The leaves and ingredients used had analgesic and anti-inflammatory properties. *Patrapinda Sweda* is highly effective in treating such clinical conditions. It helps alleviate pain and swelling.

#### **Shastika shali pinda sweda**

It can liquefy and separate the vitiated *doshas* that have adhered to the tissues, making it easier for them to be eliminated from the body. (15).

Due to its deep penetration into the skin, *Shastika Shali Pinda Sweda* has a more pronounced effect on muscles, joints, and soft tissues. This treatment increases skin blood flow, which leads to greater flexibility of the affected body part.

#### **Internal medication was prescribed according to the condition of the disease.**

*Asthi poshaka vati* works as a nutritional supplement anti-inflammatory, antioxidant, and immunomodulator. (16) In addition to supporting bone tissue recovery, *Asthiposhak* also helps maintain bone strength and mobility. It was prescribed during the treatment period as a supplement for *asthi dhatu* (bone tissue) to boost recovery during the treatment period.

*Panchatikta Ghrita Guggulu* helps to enhance bone strength. The key ingredients are *Ghee*, *Nimbu*, *Guduchi*, *Vasa*, *Patola*, and *Kantakari*. (17) *Tikta Rasa*, *Ushna Virya*, and *Katu Vipaka*, which are prevalent in *Panchatikta*

*Guggulu Ghrita*, promote *Deepana-Pachana*, raise *Dhatvagni*, and provide nutrition and stability to all *Dhatus*, particularly *Asthi* and *Majja Dhatu*. *Vayu* and *Akasha Mahabhuta*, which are dominant in *Asthi*, are in *Tikta Rasa*. As a result, it is drawn to bodily components like *Asthi*.

## Conclusion

Avascular necrosis of the femoral head has no permanent treatment other than joint replacement which is having is high risk. This case shows a successful outcome of stage 2 AVN of the femoral head, achieved using *Ayurveda Panchakarma* procedures and oral medications. The patient experienced an improvement in range of movement, quality of life, and a reduction in pain, indicating the effectiveness of Ayurveda treatments in managing Avascular necrosis of the femoral head. Ayurveda treatments can be cost-effective compared to conventional medical treatments. *Panchakarma* procedures and herbal medications used in Ayurveda are often less expensive than surgery and pharmaceuticals, making them accessible to a broader population. Additionally, Ayurveda places emphasis on lifestyle modifications, including diet and exercise, which can be relatively low-cost but have a significant impact on health outcomes.

Patients can have an improved quality of life to perform their day-to-day routine work easily after the end of the treatment. Further, it is advisable to conduct research studies with a larger sample size with a longer duration of follow-up and treatment so that proper Ayurveda treatment protocol could be established.

## References

1. Kabra D, Jena S, Bhatted SK. Avascular necrosis of femoral head - ayurveda management: a case study. *Int J Health Sci Res*. November, 2020; 10(11); 22-27.
2. Longo, F(2)auci, Kasper et al. Hand book of Harrison's Principles of General Medicine. 18th Edition, 1550, 1098p.
3. Chandu Metri, Premalata Kamate, Namrata Bhagaje. Role Of Manjisthadi Kshara Basti In Management Of Avascular Necrosis Of Femoral Head – Case Report. *International Ayurvedic Medical Journal*, January, 2021; 2763-2767.
4. Ram Lakhan Meena, Santhosh Bhatted, Prashanth Dharmarajan, Nilam Meena, Jitender Kumar, Hanumant Nirmal. Management of Avascular Necrosis through Ayurveda - A Case Study. *J. Res. Tradit*. December, 2017; 3(4); 123-128.
5. Mont MA, Hungerford DS. Non-traumatic avascular necrosis of the femoral head. *J Bone Joint Surg*: 1995. 459-474p.
6. Agnivesha, Charka Samhita, Chakrapanidatta, Vaidya Jadavaji Trikamji Acharya, Chaukhamba Sanskrit Sansthan, Varanasi, 2022, Chikitsasthana, 28/33, Pg:617.
7. Agnivesha, Charka Samhita, Chakrapanidatta, Vaidya Jadavaji Trikamji Acharya, Chaukhamba Sanskrit Sansthan, Varanasi, 2022, Chikitsasthana, 28/33, Pg:617.
8. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation, *J Bone Joint Surg Am*, June, 1969; 51(4); 737-55.
9. Bhusal Nirmal, Mangal Gopesh. Efficacy Of Dashamula Taila Kati Basti (Oil Pooling Ayurveda Procedure) In The Management Of Gridhrasi W.S.R. To Sciatica. *IAMJ*. December, 2017; 6(1); 85-89.
10. Gandhi, Rahul and Thakar, Anup and Harisha, Channappa and Shukla, Vinay. A Pharmacognostical and Pharmaceutical evaluation of Dhanyamla. *IJAM*. December, 2020; 11(4); 660-663.
11. Swathi N, Rahul S. Gandhi, Prof. Anup B. Thakar. EFFICACY OF ERANDAMOOLADI NIRUHA BASTI IN THE MANAGEMENT OF SCIATICA AND HYPERLIPIDEMIA: A CASE REPORT. *IJRAR*. June, 2020; 7(2); 207-216.
12. Jitendra Gauttam, Aosemba Jamir, Poonam Verma, Prasanth Dharmarajan, Santoshkumar Bhatted. Management of Asthi-Majjagata Vata w.s.r. to Avascular Necrosis (AVN) of Femoral Head Stage 3 By Panchakarma - A Case Study. *IJAPR*. October, 2019; 7(8); 21-28.
13. Kavita. B.S, Santosh. L, Yadahalli. A Clinical Study To Understand And Evaluate The Effect Of Panchatikta Ksheera Basti In The Prevention And Management Of Jarajanya Asthikshaya W.S.R. To Osteoporosis. *IAMJ*. November, 2018; 6(11); 2460-2465.
14. Agnivesha, Charka Samhita, Chakrapanidatta, Vaidya Jadavaji Trikamji Acharya, Chaukhamba Sanskrit Sansthan, Varanasi, 2022, Sutrasthana, 22/34, Pg:121.
15. *Ashtanga Hridaya with the commentaries Sarvangasundara of Arundatta and Ayurveda Rasayana of Hemadri*, edited by Pandit Hari Sadasiva Sastri Paradakara Bhisagacharya; Chaukhamba Sanskrit Sansthan, Varanasi, 2022, Sutrasthana, 17/29, Pg:259.
16. Khan, Zaveriya, Parwe, Shweta, Nisargandha, Milind. Management of Cervical Spondylosis Through Panchakarma and Ayurvedic Interventions - A Case Report. *IERJ*. November, 2022; 8(7); 24-26.
17. Ambikadatta Shastri. *Bhaishjyarnatnavali*. Chaukhamba Prakashan, Varanasi, Kushthrogadhikar; 2022. Pg: 904.

\*\*\*\*\*