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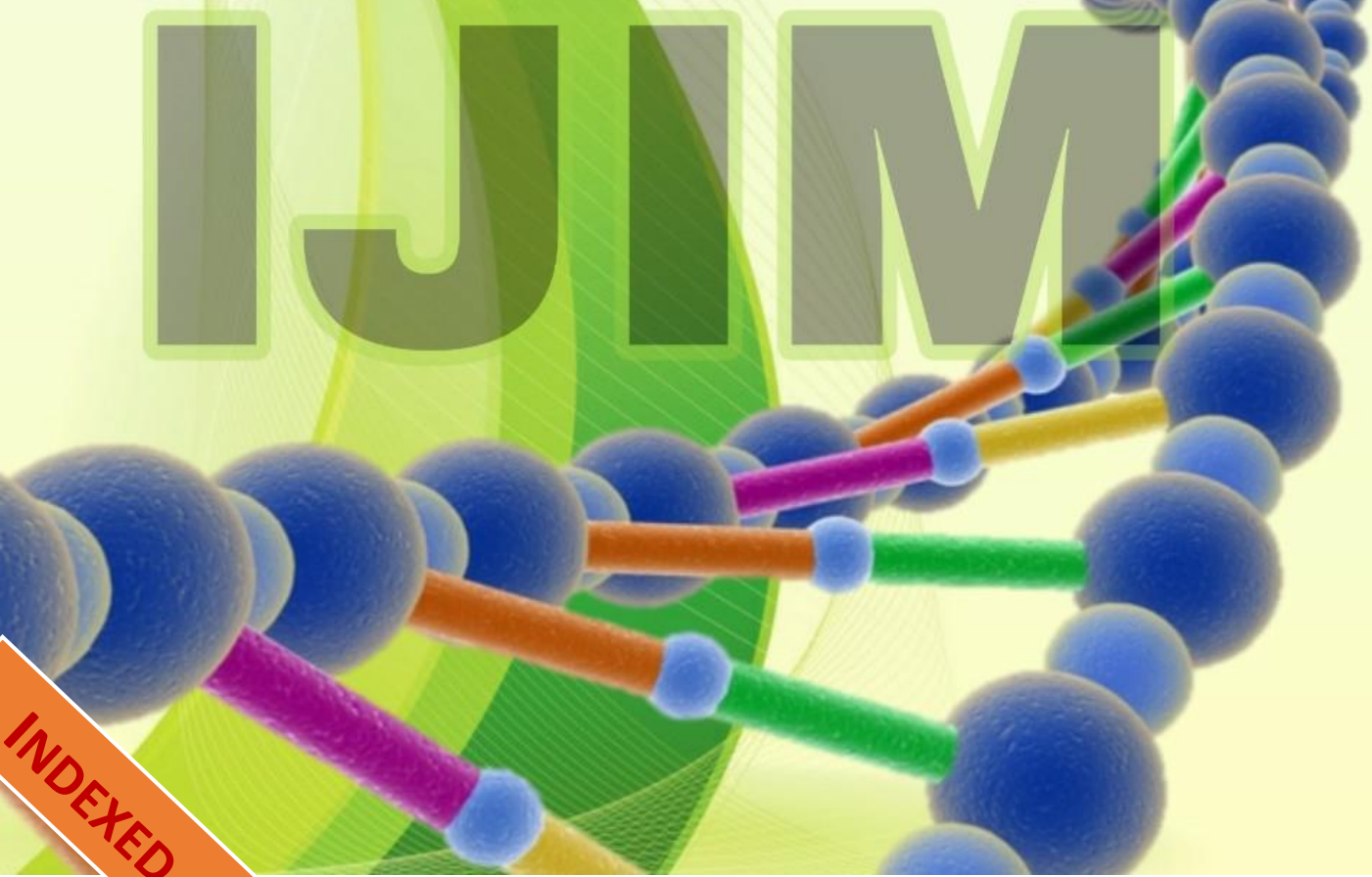

Case Study

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Joint Preservation in Bilateral Avascular Necrosis of Femoral Head through Ayurvedic Management: A Two-Year Radiological Follow-Up Case Report

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ABSTRACT: Background: Avascular necrosis (AVN) of the femoral head is a progressive osteonecrotic disorder that frequently leads to femoral head collapse and subsequent joint replacement in advanced stages. Conservative approaches aimed at joint preservation are therefore of significant clinical interest. **Aim:** To evaluate the clinical and radiological outcome of Ayurvedic management in a case of bilateral avascular necrosis of the femoral head. **Case Description and Methods:** A 33-year-old female presented with severe pain in both hip joints, difficulty in performing floor activities, and antalgic gait. Magnetic resonance imaging (MRI) findings were suggestive of bilateral avascular necrosis of the femoral head. The patient underwent *Panchatikta Ksheera Yoga Basti* during hospitalization, followed by *Matra Basti* with *Asthi-Shrinkhala Ghrita* at home, and a subsequent repeat course of *Panchatikta Ksheera Yoga Basti*. Oral Ayurvedic medications were administered throughout the treatment period according to symptomatic variations. Clinical improvement and radiological changes were assessed using serial MRI evaluation. **Results:** Significant clinical improvement was observed with reduction in hip pain within six months and improvement in gait and functional activities after approximately eighteen months. Baseline MRI demonstrated approximately 70–80% femoral head involvement bilaterally with Ficat stage III changes. Follow-up MRI after two years showed reduction of femoral head involvement to approximately 50–60% on the right side and 30–50% on the left side. The left femoral head demonstrated stage regression from Ficat stage III to stage II, indicating radiological improvement. Joint effusion noted in the initial MRI was absent in the follow-up imaging. During the follow-up period, a stress fracture of the right femoral neck was observed following a slip-and-fall incident. **Conclusion:** The present case demonstrates that structured Ayurvedic management may contribute to clinical improvement and radiological stabilization with partial regression of disease severity in bilateral avascular necrosis of the femoral head, suggesting its potential role in joint preservation strategies.

KEYWORDS: Avascular Necrosis; Femoral Head; Ayurvedic Management; Panchatikta Ksheera Yoga Basti;

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INTRODUCTION:

Avascular necrosis (AVN) of the femoral head, also known as osteonecrosis of the femoral head, is a progressive and debilitating disorder characterized by compromised blood supply to the femoral head, resulting in death of osteocytes and bone marrow components. The condition eventually leads to structural collapse of the femoral head and degenerative arthritis of the hip joint if not managed appropriately.[i] AVN most commonly affects individuals in the third to fifth decades of life and is considered one of the major causes of hip disability in young adults.[ii] The pathogenesis of AVN involves interruption or reduction of the vascular supply to the femoral head due to various etiological factors such as trauma, prolonged corticosteroid therapy, alcoholism, metabolic disorders, or idiopathic causes. The resulting ischemia leads to bone necrosis, subchondral fracture, and progressive collapse of the femoral head.[iii] Magnetic resonance imaging (MRI) is considered the most sensitive and reliable modality for early detection and staging of AVN, allowing accurate evaluation of the extent of necrosis and structural integrity of the femoral head.[iv]

Management of AVN depends on the stage of the disease. In early stages, conservative measures including pharmacotherapy and restricted weight bearing are attempted, whereas advanced stages often require surgical interventions such as core decompression, osteotomy, or total hip arthroplasty.[v] However, surgical procedures are associated with economic burden and long-term complications, particularly in young patients, making joint-preserving strategies an area of growing clinical interest.

From an Ayurvedic perspective, the clinical presentation of AVN of the femoral head can be correlated with *Asthi-Majjagata Vata*, wherein vitiated *Vata Dosha* affects the *Asthi* and *Majja Dhatu*, leading to degeneration, pain, and impairment of joint function.[vi] Classical Ayurvedic texts emphasize the role of *Basti Karma* as the principal therapeutic modality for disorders predominantly caused by *Vata Dosha*, as it helps in systemic regulation of *Vata* and provides nourishment to the *Asthi Dhatu*.

Considering the progressive nature of AVN and the need for effective conservative management, the present case report aims to evaluate the clinical and radiological outcome of Ayurvedic management in a patient with bilateral avascular necrosis of the femoral head over a two-year follow-up period.

Materials and Methods

This is a single case study conducted in the Department of Panchakarma. A 33-year-old female patient (UHID-32285) presented with complaints of severe pain in both hip joints, difficulty in walking, inability to perform floor activities, and antalgic gait since approximately three years. The patient had no history of trauma, steroid intake, or systemic illness.

Clinical Examination

On examination at September 2024, the patient exhibited restricted movements at both hip joints with significant pain (Visual Analogue Scale [VAS] score: 6/10). Gait was antalgic. General and systemic examination revealed no significant abnormalities.

From an Ayurvedic perspective, the condition was assessed as *Asthi-Majjagata Vata*. The patient had *Madhyama Agni*, *Krura Koshtha*, unsatisfactory bowel habits, and normal sleep pattern.

Diagnostic Assessment

Baseline magnetic resonance imaging (MRI) of pelvis with both hip joints (dated 13/07/2024) revealed bilateral avascular necrosis of the femoral head with Ficat and Arlet Stage III changes and approximately 70–

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80% involvement of both femoral heads along with joint effusion.

Therapeutic Intervention

The patient underwent two courses of *Panchatikta Ksheera Yoga Basti* in a *Yoga Basti* pattern during hospitalization.

First admission: 11/11/2024 to 19/11/2024
Second admission: 18/12/2025 to 25/12/2025

During hospitalization, the following procedures were administered:

Table:1 Chronological Treatment Protocol with Dosage and Procedures

Phase	Duration / Dates	Intervention	Details / Composition	Dose / Quantity	Mode
Baseline	09/09/24	Clinical condition	Severe bilateral hip pain, antalgic gait, restricted movements	VAS: 6/10	OPD -32630
First Hospitalization	11/11/2024 to 19/11/2024	*Panchatikta Ksheera Yoga Basti* (Yoga Basti pattern)			Inpatient
		Sthanika Abhyanga	*Nirgundi Taila*	LA	External
		Nadi Swedana	Local sudation	—	External
		Anuvasana Basti	*Panchatikta Ghrita* + *Sahacharadi Taila*	30 ml + 30 ml	Rectal
		Niruha Basti	*Makshika* (30 g), *Saindhava* (6 g), *Sahacharadi Taila* (30 ml), *Panchatikta Ghrita* (30 ml), *Putoyavani Kalka* (25 g), *Panchatikta Kwatha* + *Dashamula Kwatha* (400 ml)	Total ~400 ml	Rectal
		Upanaha Karma	*Yava*, *Godhuma*, *Saindhava*, *Nirgundi*, *Arka Patra*, *Dashamula Taila*	QS	Local application
Post First Admission	1 month (20/11/24 to 20/12/24)	*Matra Basti*	*Asthishrinkhala Ghrita*	40 ml daily	Home-based
		Oral medicines	*Lakshadi Guggulu*	2 TDS AF	Oral
Follow-up 1	~6 months	Clinical improvement	Pain reduced, gait improved, ROM better	VAS: 4/10	OPD -52725
Second Hospitalization	18/12/2025 to 25/12/2025	*Panchatikta Ksheera Yoga Basti* (Repeat)			Inpatient (PK/1575/Dec-2025)
		Sthanika Abhyanga	*Nirgundi Taila*	—	External
		Nadi Swedana	Local sudation	—	External
		Anuvasana Basti	Same as above	30 ml + 30 ml	Rectal
		Niruha Basti	Same as above	~400 ml	Rectal
		Upanaha Karma	Same as above	QS	Local

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Post Second Admission		Oral medicines	*Lakshadi Guggulu*	2 TDS AF	Oral
			Asthi Shrinkhala Ghrita	15 ml BD BF	Oral
Follow-up 2	~1 year (10/01/26)	Clinical improvement	Minimal pain, excellent ROM, good gait	VAS: 2/10	OPD -1374
Intercurrent Event	Post 2nd follow-up 23/02/26	Slip and fall	Acute pain in right thigh	VAS: 6/10	—
		MRI evaluation	Stress fracture neck of femur (Right)	—	—
		Management	Complete rest (2 weeks)	—	Conservative
Final Follow-up	2 years	Clinical status	Pain subsided, movement improving	VAS: 2/10	—
		MRI findings	Stage improvement (Left), % reduction bilaterally	—	—

Summary of Therapeutic Approach

The treatment protocol consisted of repeated administration of *Panchatikta Ksheera Yoga Basti* in a *Yoga Basti* schedule, supported by *Matra Basti*, external therapies, and individualized oral medications. The intervention was planned to target *Vata Dosha* and promote nourishment of *Asthi Dhatu*, thereby aiming at disease stabilization and joint preservation.

1. Outcome Measures

The outcomes were assessed based on:

1. Pain intensity using Visual Analogue Scale (VAS)
2. Gait assessment (antalgic to normal walking)
3. Functional ability (walking and floor activities)
4. Range of motion at hip joint
5. Radiological assessment using MRI (Ficat staging and percentage involvement)

Follow-up assessments were performed at regular intervals, including post-first admission, post-second admission, and at two-year follow-up.

Assessment of Clinical and Radiological Outcomes

Table 2: Clinical Outcome Assessment

Parameter	Baseline	After 1st Basti (Nov 2024)	After 2nd Basti (Dec 2025)	Post Slip Event	Event Follow-up (After 2 wk)
Pain (VAS)	6/10	4/10	2/10	Increased (acute 6)	2/10
Gait	Antalgic	Improved	Near normal	Restricted	Mild restriction
Walking ability	Difficult	Moderate improvement	Good	Restricted	Improved
Range of motion	Restricted	Improved	Excellent	Restricted temporarily	Improved

Table 3: Radiological Outcome Assessment (MRI Comparison)

Radiological Parameter	Before Treatment (BT) MRI – 13/07/2024	After Treatment (AT) MRI – 23/02/2026	Interpretation

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Side involved	Bilateral femoral head	Bilateral femoral head	Disease present on both sides
Ficat–Arlet Stage (Right)	Stage III	Stage III	Disease stabilized
Ficat–Arlet Stage (Left)	Stage III	Stage II	**Radiological improvement**
Femoral head involvement (Right)	~70–80%	~50–60%	**Approx. 20–25% reduction**
Femoral head involvement (Left)	~70–80%	~30–50%	**Approx. 35–40% reduction**
Kerboul angle	Not specified	Right: ~265°, Left: ~220°	Moderate necrotic area
Bone marrow edema	Present	Reduced / minimal	Improvement
Hip joint effusion	Present bilaterally	Absent	Resolution of effusion
Articular cartilage	Intact	Intact	Joint preservation
Additional findings	AVN changes	Stress fracture neck of femur (Right) after slip fall	Secondary traumatic event

Summary of Outcome

The patient demonstrated significant clinical improvement in terms of pain reduction, gait normalization, and functional ability following Ayurvedic intervention. Radiological comparison demonstrated stabilization of disease progression with partial regression in the left femoral head, where the stage improved from Ficat stage III to stage II along with reduction in the necrotic area. The absence of joint effusion and preservation of articular cartilage further indicate maintenance of joint integrity, suggesting a potential joint-preserving effect of the Ayurvedic intervention.

DISCUSSION:

Avascular necrosis (AVN) of the femoral head is a multifactorial disorder characterized by compromised microcirculation leading to ischemia, osteocyte death, and subsequent structural collapse. In recent years, an increased incidence of AVN has been observed following COVID-19 infection and corticosteroid exposure, suggesting a possible role of microvascular thrombosis and endothelial dysfunction in its pathogenesis. [vii] The present case, although idiopathic in presentation, may be understood in the broader context of altered vascular dynamics and bone metabolism.

From an Ayurvedic perspective, the clinical presentation of AVN closely resembles *Asthi-Majjagata Vata*, wherein aggravated *Vata Dosha* localizes in *Asthi* and *Majja Dhatu*, resulting in pain (*Shoola*), restriction of movement, and progressive degeneration. The chronicity of symptoms and involvement of deeper *Dhatus* indicate a state of *Dhatu Kshaya* and *Vata Prakopa*, necessitating *Brimhana* and *Vatahara* line of management.

First Phase of Treatment (November 2024)

During the first hospitalization, *Panchatikta Ksheera Yoga Basti* was administered in a *Yoga Basti* schedule. *Basti Karma* is considered the prime modality for managing *Vata Dosha*, as described in classical Ayurvedic texts. The selection of *Panchatikta Ksheera Yoga* is particularly significant in

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Asthi Pradoshaja Vikara, as indicated by Acharya Charaka. [viii]

The *Tikta Rasa* dominant drugs possess *Vayu* and *Akasha Mahabhuta* predominance, [ix] facilitating deep tissue penetration and channel cleansing (*Srotoshodhana*). However, when processed with *Ksheera* (milk) and *Ghrita*, which are *Snigdha* and *Brimhana* in nature, the formulation acquires dual action—both detoxifying and nourishing. This combination is especially relevant for *Asthi Dhatu*, which is also predominantly composed of *Prithvi* and *Vayu Mahabhuta*. Thus, *Panchatikta Ksheera Basti* provides a synergistic effect by correcting *Vata Dosha* and promoting regeneration of bone tissue.

The observed clinical improvement after the first course, including reduction in pain and improvement in gait and range of motion, may be attributed to improved microcirculation, reduction in inflammation, and enhanced nourishment of *Asthi-Majja Dhatu*.

Intervening Phase (Matra Basti and Oral Medication)

Following the first hospitalization, *Matra Basti* with *Asthishrinkhala Ghrita* was administered for one month. *Asthishrinkhala* (*Cissus quadrangularis*) is well-documented for its osteogenic and fracture-healing properties, promoting osteoblastic activity and enhancing bone mineralization. [x] The lipid-based medium (*Ghrita*) facilitates better bioavailability and deeper tissue penetration. Concomitantly, oral Ayurvedic medications, including formulations such as *Lakshadi Guggulu*, were prescribed based on symptomatic variations. *Lakshadi Guggulu* has been reported to possess bone-healing, anti-inflammatory, and anabolic effects on bone tissue, thereby contributing to structural stability and prevention of further degeneration. [xi]

Second Phase of Treatment (December 2025)

A second course of *Panchatikta Ksheera Yoga Basti* was administered to reinforce the therapeutic effect. Repeated administration of *Basti* is known to provide sustained regulation of *Vata Dosha* and continuous nourishment of *Dhatus*. By this stage, the patient demonstrated significant clinical improvement, including minimal pain, near-normal gait, and excellent range of motion.

Radiological Improvement

The follow-up MRI findings demonstrated reduction in the extent of femoral head involvement and regression of Ficat stage from III to II on the left side, indicating partial reversal of disease progression. The absence of joint effusion and preservation of articular cartilage further support the hypothesis that Ayurvedic intervention may contribute to stabilization of the disease and prevention of joint collapse.

The probable mechanism underlying this improvement may include enhanced vascularity, reduction in intraosseous pressure, and stimulation of reparative processes within the bone tissue, mediated through *Basti Karma* and osteo-protective herbal formulations.

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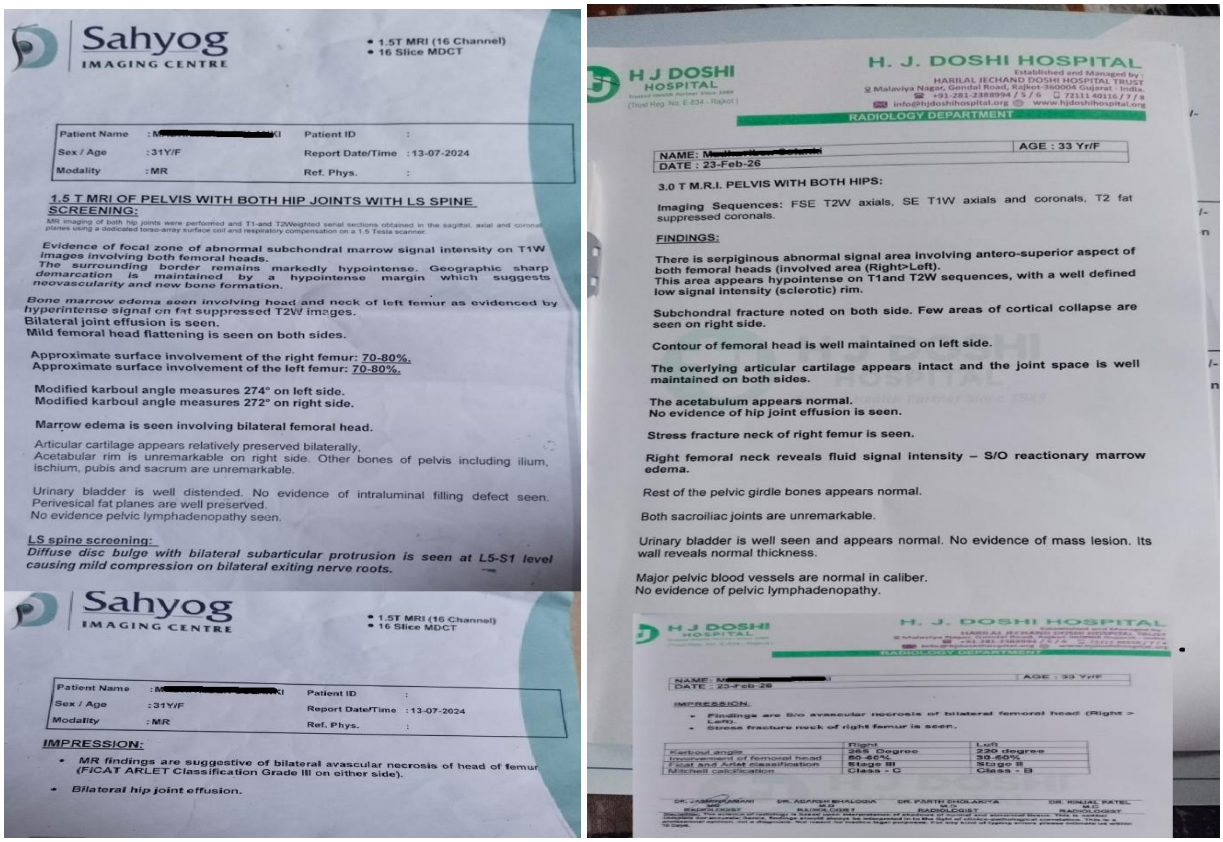

Sahyog IMAGING CENTRE
• 1.5T MRI (16 Channel)
• 16 Slice MDCT

Patient Name : [redacted] Patient ID :
Sex / Age : 31Y/F Report Date/Time : 13-07-2024
Modality : MR Ref. Phys. :

1.5 T MRI OF PELVIS WITH BOTH HIP JOINTS WITH LS SPINE SCREENING:

MR imaging of both hip joints were performed and T1-and T2Weighted serial sections obtained in the sagittal, axial and coronal planes using a dedicated torso-array surface coil and respiratory compensation on a 1.5 Tesla scanner

Evidence of focal zone of abnormal subchondral marrow signal intensity on T1W images involving both femoral heads.
The surrounding border remains markedly hypointense. Geographic sharp demarcation is maintained by a hypointense margin which suggests neovascularity and new bone formation.

Bone marrow edema seen involving head and neck of left femur as evidenced by hyperintense signal on fat suppressed T2W images.
Bilateral joint effusion is seen.
Mild femoral head flattening is seen on both sides.

Approximate surface involvement of the right femur: 70-80%.
Approximate surface involvement of the left femur: 70-80%.

Modified karboul angle measures 274° on left side.
Modified karboul angle measures 272° on right side.

Marrow edema is seen involving bilateral femoral head.

Articular cartilage appears relatively preserved bilaterally.
Acetabular rim is unremarkable on right side. Other bones of pelvis including ilium, ischium, pubis and sacrum are unremarkable.

Urinary bladder is well distended. No evidence of intraluminal filling defect seen.
Perivesical fat planes are well preserved.
No evidence pelvic lymphadenopathy seen.

LS spine screening:
Diffuse disc bulge with bilateral subarticular protrusion is seen at L5-S1 level causing mild compression on bilateral exiting nerve roots.

Sahyog IMAGING CENTRE
• 1.5T MRI (16 Channel)
• 16 Slice MDCT

Patient Name : [redacted] Patient ID :
Sex / Age : 31Y/F Report Date/Time : 13-07-2024
Modality : MR Ref. Phys. :

IMPRESSION:
- MR findings are suggestive of bilateral avascular necrosis of head of femur (FICAT ARLET Classification Grade III on either side).
- Bilateral hip joint effusion.

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RADIOLOGY DEPARTMENT

NAME: [redacted] AGE : 33 Yr/F
DATE : 23-Feb-26

3.0 T M.R.I. PELVIS WITH BOTH HIPS:

Imaging Sequences: FSE T2W axials, SE T1W axials and coronals, T2 fat suppressed coronals.

FINDINGS:

There is serpiginous abnormal signal area involving antero-superior aspect of both femoral heads (involved area (Right>Left).
This area appears hypointense on T1and T2W sequences, with a well defined low signal intensity (sclerotic) rim.

Subchondral fracture noted on both side. Few areas of cortical collapse are seen on right side.

Contour of femoral head is well maintained on left side.

The overlying articular cartilage appears intact and the joint space is well maintained on both sides.

The acetabulum appears normal.
No evidence of hip joint effusion is seen.

Stress fracture neck of right femur is seen.

Right femoral neck reveals fluid signal intensity – S/O reactionary marrow edema.

Rest of the pelvic girdle bones appears normal.

Both sacroiliac joints are unremarkable.

Urinary bladder is well seen and appears normal. No evidence of mass lesion. Its wall reveals normal thickness.

Major pelvic blood vessels are normal in caliber.
No evidence of pelvic lymphadenopathy.

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RADIOLOGY DEPARTMENT

NAME: [redacted] AGE : 33 Yr/F
DATE : 23-Feb-26

IMPRESSION:
- Findings are S/o avascular necrosis of bilateral femoral head (Right > Left).
- Stress fracture neck of right femur is seen.

	Right	Left
Karboul angle	245 Degree	230 degree
Involvement of femoral head	80-85%	30-50%
Fiat and Arlet classification	Stage III	Stage II
Mitchell calculation	Class - C	Class - B

DR. [redacted] DR. ASHISH BHALODIA DR. PARTH SHOLARIYA DR. HIMJAL PATEL
RADIOLOGIST RADIOLOGIST RADIOLOGIST RADIOLOGIST

Image 1 : BT- Radiological report (MRI – 13/07/2024)
Image 2 : AT- Radiological report (MRI – 23/02/2026)

Intercurrent Event: Stress Fracture

The occurrence of stress fracture in the right femoral neck following a slip and fall represents a secondary traumatic event rather than progression of the primary pathology. In AVN, the structural integrity of bone remains compromised due to necrosis, predisposing it to fractures even with minor trauma. The conservative management with rest and subsequent reduction in pain further supports this interpretation.

Overall Interpretation

The chronological improvement observed in this case—from significant pain and restricted mobility to functional restoration and radiological stabilization—suggests a beneficial role of Ayurvedic management in AVN. The integrative approach involving *Basti Karma*, *Brimhana* therapy, and osteogenic herbal formulations appears to address both the symptomatic and structural aspects of the disease.

Thus, the present case highlights the potential of Ayurveda in altering the natural course of AVN by targeting the underlying *Dosha-Dhatu* imbalance and promoting joint preservation.

CONCLUSION:

This case demonstrates that structured Ayurvedic management, including *Panchatikta Ksheera Yoga Basti* and supportive therapies, may result in significant clinical improvement and radiological stabilization in bilateral avascular necrosis of the femoral head. Over a two-year follow-up, reduction in pain, improvement in function, and partial regression in disease severity were observed, along with preservation of joint integrity. These findings suggest a potential role of Ayurveda in joint preservation and highlight the need for further systematic studies to validate these outcomes.

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Conflict of Interest
The authors declare that there are no conflicts of interest regarding the publication of this case report.

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