Research Article

# Saghrita Ksheer Basti In The Management of Asthi Majjagata Vata W.S.R. To Avascular Necrosis of The Femoral Head: A Classical Textual Review Correlated With Clinical Trial Findings

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**Abstract**

Background: Avascular necrosis (AVN) of the femoral head is a progressive and debilitating disorder in modern orthopaedics with limited conservative treatment options. In Ayurveda, this pathology is termed as Asthi Majjagata Vata and can be treated by Vata-Shamana and Dhatu-Brimhana therapy like Basti Chikitsa. Objective: To Discuss Classical Textual Justification for Saghrita Ksheer Basti with AVN of femoral head in YAPANA Basti pattern with registered clinical trial related outcome. Methods: A narrative classical-textual review was performed and 30 patients with AVN of the femoral head were examined at BT, AT and 15-day FU on VAS, associated complaint grading and Harris Hip Score (HHS). Conclusion: Statistically significant improvements were seen in all subjective and objective parameters (VAS, Gaman Kashtata, Sandhigraha and HHS Total, $p<0.001$), mean HHS increased from 62.10 (BT) to 85.17 (AT) and 88.13 (FU), mean VAS decreased from 6.60 to 2.00 and no patient had progression of AVN lesion at After Treatment. Conclusion: The classical indication of Saghrita Ksheer Basti in Yapana pattern (Vata-Shamana and Asthi-Majja Brimhana therapy) is substantiated in this clinical observation and shows that this therapy is suitable to be advocated as an intervention in AVN of the femoral head.

**Keywords:** Avascular Necrosis, Asthi Majjagata Vata, Saghrita Ksheer Basti, Yapana Basti, Panchakarma.

## Introduction

Avascular necrosis (AVN) of the femoral head, or osteonecrosis, is a condition in which the bone dies as a result of loss of blood supply to an area of bone tissue; in extreme cases this results in collapse of the affected segment and, once the joint surface is involved, progressive arthritis.[1] AVN may be primary (idiopathic) or secondary to conditions such as sickle cell disease, systemic lupus erythematosus, prolonged corticosteroid use, and chronic alcohol excess, and it typically affects men aged 35–45 years, with bilateral involvement in over half of patients.[1] Disease is frequently asymptomatic in early stages; as it progresses, patients report an ache in the groin, a limp, and progressive restriction of hip movement.[2] Management in contemporary orthopaedic practice — drilling and bone grafting, Whitman or Colonna reconstruction, and prosthetic replacement — remains costly, with a generally poor prognosis in advanced disease.[1]

The clinical presentation of AVN corresponds closely with Asthi Majjagata Vata, a condition described under the Vatavyadhi group of disorders in classical Ayurvedic texts. Acharya Charaka describes that when aggravated Vata afflicts Asthi and Majja Dhatu, it produces a breaking type of continuous pain in the bone (Bheda), loss of muscle strength (Mamsabalakshaya), joint pain, and disturbed sleep (Asvapna) — a symptom complex that parallels the presentation of AVN.[3] Signs and symptoms of AVN are considered to fall within Asthivaha Srotodushti Vikara and may be correlated with the chronic stage of Asthi Majjagata Vata.[1]

Asthi Dhatu and Vata Dosha are related through the classical principle of Ashraya-Ashrayi Bhava, wherein Asthi is described as the Ashraya (seat) of Vata; consequently, elevation of Vata is accompanied by Kshaya (depletion) of Asthi, and vice versa. Majja, filling the interior of Asthi, is produced from Asthi Dhatu by Uttarottara Dhatu Poshana and in turn provides Sneha and Bala to the body. Disruption of the normal nourishment of Asthi Dhatu — through Margavarodha (channel obstruction) or Dhatu Kshaya — therefore predisposes to progressive depletion of both Asthi and Majja, culminating in Asthi Majjagata Vata.[4] It is this conceptual framework, together with the specific classical indication of Ksheera- and Sarpi-based Basti for Asthigata Vata, that provides the rationale for the intervention reviewed here.

Contemporary orthopaedic staging of AVN most commonly follows the Ficat–Arlet or ARCO (Association Research Circulation Osseous) systems, which classify disease from Stage 0/I to Stage IV. Earlier-stage disease is generally regarded as more amenable to joint-preserving management, while advanced-stage disease increasingly requires arthroplasty.[1]

Among the various joints affected by AVN — hip, knee, shoulder, wrist, ankle, hands, and feet — the femoral head remains the most commonly affected site. Historically, approximately 16,000 new cases of AVN were diagnosed annually in India; a marked increase in new cases has been observed following the COVID-19 pandemic, attributed in part to corticosteroid use during and after acute illness.[14] Management of AVN aims at preservation of structure and function and relief from pain; where conservative measures fail, surgical procedures such as core decompression with bone grafting, Whitman or Colonna reconstruction, and prosthetic insertion are undertaken, though these remain costly and are associated with a generally poor long-term prognosis, particularly in a younger patient population for whom implant longevity is a significant concern.[1]

This review draws on a registered clinical trial conducted in the P.G. Department of Panchakarma, Post Graduate Institute of Ayurveda, Dr. Sarvepalli Radhakrishnan Rajasthan Ayurveda University, Jodhpur, evaluating Saghrita Ksheer Basti in Yapana Basti pattern in 30 patients of AVN of the femoral head. The present article aims to situate the classical textual understanding of Asthi Majjagata Vata and the pharmacodynamic rationale of Saghrita Ksheer Basti alongside the clinical outcomes recorded in this trial.

## Conceptual Review: Asthimajjagata Vata

Asthi Majjagata Vata is classified by all Acharyas under Vatavyadhi — disorders arising exclusively from vitiation of Vata Dosha, regarded by Acharya Vagbhata as Maharoga (a major disease category) given its extent and severity. Acharya Chakrapani defines Vata Vyadhi both as "Vata Eva Vyadhi" (Vata itself constituting the disease) and "Vatat Vyadhi" (disease arising from Vata), while Acharya Vijayrakshita describes it as an Asadharana Vyadhi (disease of distinctive/exceptional character) caused by vitiated Vata.[5] Within the broader category of Gatavata (Vata that abnormally localizes in a Dhatu, Upadhatu, or Ashaya), Asthimajjagata Vata belongs to Dhatugata Vata, denoting pathological lodgement of Vata specifically in Asthi and Majja Dhatu.[6]

No distinct Samprapti (pathogenesis) is separately described for Asthi Majjagata Vata in the classics; it is therefore understood through the general Samprapti of Vatavyadhi.[7] Vitiation of Vata occurs through Abhighata (trauma) or Margavarodha (channel obstruction); through Ashraya-Ashrayi Bhava this aggravated Vata leads to depletion of Asthi Dhatu, following which the vitiated Vata localizes preferentially at sites of Khavaigunya (structural weakness), producing degeneration of Asthi and Majja Dhatu. Acharya Charaka states that aggravated Vata fills the Rikta Srotas (depleted channels) of the body and manifests as localized or systemic disease depending on the site of lodgement (Ch. Chi. 28/18-19).[7] The pathogenesis can further be mapped onto the six stages of Kriyakala — Sanchaya, Prakopa, Prasara, Sthanasamshraya, Vyakti, and Bheda — with Sthanasamshraya in Asthi and Majja representing the prodromal phase and Vyakti Avastha corresponding to clinically evident AVN.[7] This staged progression is summarized in Table 1, mapped against its modern clinical correlate at each stage.

| Kriyakala Stage | Classical Description | Correlate in AVN |
|---|---|---|
| Sanchaya | Accumulation of Vata in its own site | Sub-clinical predisposing state |
| Prakopa | Aggravation of accumulated Vata | Onset of risk-factor exposure (e.g., corticosteroid, trauma) |
| Prasara | Spread of aggravated Vata through the body | Systemic/vascular spread of pathological process |
| Sthanasamshraya Purvarupa stage | Localization of Vata at a site of Khavaigunya | Localization at femoral head (site of structural weakness) |
| Vyakti | Full clinical manifestation of disease | Clinically evident, symptomatic AVN |
| Bheda | Chronicity, complication, or structural change | Subchondral collapse; advanced (Stage III–IV) disease |

The Samprapti Ghatakas of the disease are summarized as: Dosha — Vata Pradhana Tridosha; Dushya — Mamsa, Asthi, Majja, and Sandhi; Srotas — Asthivaha, Majjavaha, and Mamsavaha; with resulting clinical features including Bheda Asthiparvanam (piercing/breaking bone pain), Sandhi Shoola, Satata Ruk (persistent pain), Mamsabalakshaya, and Asvapna.[7] This classical formulation — channel obstruction impairing Rakta-borne nourishment to Asthi, precipitating Asthi and Majja Dhatu Kshaya — offers a conceptual parallel to the vascular compromise and ischemic bone death described in modern osteonecrosis literature, even though Ayurveda does not describe a direct vascular mechanism in contemporary terms.

These Samprapti components may be organized as Samprapti Ghatakas — the fundamental factors of Dosha, Dushya, Srotas, and Agni through which any pathogenesis is described in Ayurveda — as summarized in Table 2. Notably, the Vyadhi Marga is classified as Madhyama (involving Marma, Asthi, and Sandhi), a classification that carries direct prognostic significance discussed further in Section 2.2, and the Srotodushti Prakara is specifically Sanga (obstructive), corresponding conceptually to the vascular obstruction underlying AVN in modern pathophysiology.

| Samprapti Ghatak | Finding in Asthi Majjagata Vata |
|---|---|
| Dosha | Vata Pradhana Tridosha |
| Dushya | Mamsa, Asthi, Majja, Sandhi |
| Srotas | Asthivaha, Majjavaha, Mamsavaha |
| Agni | Vishamagni |
| Vyadhi Marga | Madhyama (Marma-Asthi-Sandhi) |
| Adhishthana | Asthi–Sandhi |
| Srotodushti Prakara | Sanga (obstruction) |
| Udbhava Sthana | Pakvashaya |
| Svabhava | Chirkari (chronic) |

## Differential Diagnosis (Sapeksha Nidana)

Several classically described conditions share overlapping features with Asthi Majjagata Vata and merit differentiation in clinical practice. Gambhira Vatarakta (correlated with gout) presents with severe pain, inflammation, tenderness, and restricted joint movement, but its pathogenesis predominantly involves vitiation of Vata and Rakta rather than Asthi-Majja Kshaya. Asthi-Majja Kshaya (correlated with osteoporosis) shares bone weakness, pain, and structural fragility, but represents generalized reduction in bone mass rather than localized ischemic necrosis. Aamavata (correlated with rheumatoid arthritis) involves Ama and vitiated Vata, producing joint pain, swelling, and stiffness that may mimic early Asthi Majjagata Vata, requiring careful differentiation particularly in Stage I disease. Asthi Vidradhi (correlated with osteomyelitis) involves inflammatory/infective pathology of bone with pain, tenderness, and swelling, distinguished from AVN by its infective etiology. This differential framework corresponds to the exclusion criteria used in the present trial, which specifically excluded inflammatory arthritis, Pott's spine, bone tuberculosis, traumatic injury, and bone tumours — a modern operationalisation of the same diagnostic discrimination described classically.

## Nidana, Purvarupa, And Rupa

As with Nidana, the classics do not describe a distinct Purvarupa (prodromal symptomatology) for Asthi Majjagata Vata specifically; it is therefore understood through the general Purvarupa of Vatavyadhi, occurring at the Sthanasamshraya stage of Kriyakala. Acharya Charaka states that unmanifest signs (Avyakta Lakshana) of an impending Vata disorder constitute its Purvarupa, a position elaborated by commentator Vijayarakshita, who defines Avyakta as symptoms not yet readily apparent.[11] Weak, intermittent, or subtle musculoskeletal discomfort preceding overt disease may accordingly be interpreted as the Purvarupa of Asthi Majjagata Vata — a formulation that corresponds with the frequently asymptomatic or minimally symptomatic early (Stage I) presentation described for AVN in orthopaedic literature.[2]

The Rupa (clinical features) of the fully manifest condition are described succinctly by Acharya Charaka: Bheda Asthiparvanam (a breaking type of pain in the bones and joints), Sandhi Shoola (joint pain), Mamsabalakshaya (loss of muscle strength), Asvapna (disturbed sleep), and Santata Ruk (continuous pain) (Ch. Chi. 28/33).[3] These five features formed the basis for the subjective assessment parameters used in the present trial — Sandhishoola

(via VAS), Gaman Kashtata, Sandhigraha, and Mamsabalakshaya — allowing the trial's outcome measures to be read as a direct clinical operationalisation of the classical Rupa of this condition.

**Table 3 below reproduces the classical symptom picture as described by Acharya Charaka, alongside its modern correlate.**

| Classical Symptom (Ch. Chi. 28/33) | Explanation | Modern Correlate in AVN |
|---|---|---|
| Bhedo Asthiparvanam | Breaking/cracking type of pain in bones and joints | Deep groin/hip pain, worse on weight-bearing |
| Sandhi Shoola | Pain in the joint | Hip joint pain |
| Mamsabalakshaya | Loss of muscle power | Periarticular muscle wasting/weakness |
| Asvapna | Sleeplessness | Pain-related sleep disturbance |
| Santata Ruk | Continuous pain | Persistent, non-remitting pain pattern |

## Sadhya-Asadhyata (Prognosis)

Acharya Charaka observes that disorders of Asthi and Majja Dhatu are Gambhira (deep-seated) in nature and may or may not respond fully to treatment; such conditions are best treated diligently, particularly in physically strong individuals, of recent onset, and free of complications (Ch. Chi. 28/73–74).[12] Commentator Chakrapani interprets Gambhirya as denoting involvement of deeper tissues, while other scholars read it as indicating chronicity. Marma, Asthi, and Sandhi are classified under Madhyama Roga Marga, and diseases progressing along this pathway are generally considered Kricchasadhya (difficult, though not impossible, to cure).[12] AVN — involving the deep-seated Asthi and Majja Dhatu and following this Madhyama Roga Marga — is therefore appropriately regarded as a Kricchasadhya Vyadhi rather than a Sadhya (easily curable) or wholly Asadhya (incurable) one; advanced age, Vata Prakriti, longer duration of illness, and greater severity of tissue damage or complications are classically expected to worsen prognosis. This framing is consistent with the trial's exclusion of Stage IV disease and its selection of patients aged 20–60 years, both of which can be read as an attempt to work within the Kricchasadhya rather than Asadhya range of the disease.

## Rationale For Saghrita Ksheer Basti In Yapana Pattern

Basti, the medicated-enema procedure central to Panchakarma, is classically defined as the process by which medicine prepared according to Shastric reference is administered through the rectal canal; on reaching the Nabhi Pradesh, Kati, Parshva, and Kukshi, it churns the accumulated Dosha and Purisha, pervades the body with unctuousness, and is expelled together with the churned Dosha and Purisha. Acharya Charaka further states that Panchakarma procedures constitute the definitive medicine for diseases afflicting Asthi (Asthyashrayanam Vyadhinam Panchakarmani Bheshajam), and that among these, Basti is specifically indicated, with commentator Chakrapani clarifying that Basti should be administered as the foremost of all Panchakarma procedures in this context, and Charaka further specifying that Tikta-Dravya-Siddha Ksheera, Ghrita, and Basti are effective in such conditions. This foundational definition and specific indication together form the direct textual basis for selecting a Ksheera-Ghrita Basti as the intervention of choice in the present trial, ahead of alternative Panchakarma procedures.

The general principles of Vata Chikitsa as described in Ashtanga Hridaya prescribe Snehana, Swedana, mild Shodhana, a diet of Madhura-Amla-Lavana-Ushna qualities, Abhyanga, and — of particular relevance here — Snigdha and Ushna Basti administered with Basti-Niyama (A.H. Su. 13/1-3).[8] Basti is regarded in these texts as the foremost of all therapeutic measures for Vata disorders, capable of correcting Vata even where other modalities fail. Where Vata aggravation is Nirupastambhita (uncomplicated by obstruction), Anuvasana Basti using medicated oils or Ghrita is specifically indicated for nourishment and pacification; where obstruction (Avarana) is present, Niruha Basti combined with Deepana-Pachana measures is used to first clear the channels before nourishing therapy is instituted.[9]

Most specifically, Acharya Charaka states that the Panchakarma procedures are the definitive Bheshaja (medicine) for diseases afflicting Asthi, and that Basti and Pana prepared with Ksheera and Sarpi, processed with Tikta Dravyas, are indicated in the management of Asthigata Vata (Ch. Su. 28/27).[10] Elsewhere it is stated that Asthi and Majjagata Vata is overcome through both external and internal Sneha — external Sneha via Abhyanga,

internal Sneha via Pana and Basti (Ch. Chi. 28/93).[10] These two references form the direct classical basis for using a Ksheera-Ghrita Basti in this condition: Ksheera and Ghrita are Snigdha, Guru, and Brimhana in Guna, directly opposing the Ruksha and Laghu qualities of aggravated Vata, and are specifically described as nourishing to Asthi and Majja Dhatu.

In the present trial, Saghrita Ksheer Basti was prepared using Madhu (60 ml), Saindhava Lavana (12 gm), Go Ghrita as the Sneha Dravya (~120 ml), Shatpushpa Kalka (~15 gm), and a Ksheerpaka (~250 ml) prepared from Manjistha (Rubia cordifolia), Arjuna (Terminalia arjuna), and Giloya (Tinospora cordifolia) Kwatha in milk, to a total quantity of approximately 450 ml per administration. The Basti was administered in Kala (Yapana Basti) pattern over 16 consecutive days, preceded by local Abhyanga with Tila Taila and Nadi Swedana as Poorva Karma, and followed by standard Pashchata Karma. The Yapana pattern — permitting repeated, sustained daily administration without the alternating Anuvasana-Niruha schedule required in Vata-Kaphaja or Shodhana-oriented Basti regimens — was selected as appropriate to the chronic, slowly progressive nature of AVN, where a prolonged Brimhana and Vata-Shamana therapeutic window is required rather than acute purificatory action.

Beyond Ksheera and Ghrita, the individual constituents of the Saghrita Ksheer Basti formulation each carry a classically-recognised action consistent with this Vata-Shamana, Dhatu-Brimhana intent. Madhu and Saindhava Lavana are traditionally included in Basti formulations as Yogavahi and Anulomana agents respectively, assisting the penetration and downward movement of the principal Sneha Dravya. Shatpushpa (Anethum sowa) is classically credited with Vata-Shamaka and Shoolahara properties, supporting its inclusion for Sandhi Shoola. The Kwatha components — Manjistha (Rubia cordifolia), Arjuna (Terminalia arjuna), and Giloya (Tinospora cordifolia) — are described in the Nighantu literature for Raktaprasadana (blood-purifying), Hridya and Vata-Pitta-Shamaka, and Rasayana (rejuvenative, Tridoshahara) properties respectively; their inclusion in a Ksheerpaka intended for a Rakta-Margavarodha-associated, Vata-dominant Dhatu Kshaya condition is therefore classically coherent, though this correlation is offered here as a rationale for formulation design rather than as an established modern pharmacological mechanism.

## Integrating Classical and Contemporary Perspectives on Mechanism

Contemporary understanding of AVN pathophysiology centres on interruption of the intraosseous blood supply through one or more converging mechanisms: mechanical vascular disruption (as in femoral neck fracture or dislocation), intravascular coagulation and fat embolism (implicated in corticosteroid- and alcohol-associated disease), and raised intraosseous pressure secondary to marrow fat-cell hypertrophy, all of which compromise the end-arterial supply characteristic of the femoral head and precipitate osteocyte death, trabecular microfracture, and eventual subchondral collapse. While Ayurveda does not describe a vascular mechanism in these specific biomedical terms, the classical concept of Margavarodha (channel obstruction) impeding the flow of nourishment to Asthi and Majja Dhatu, and the resultant Dhatu Kshaya, describes a structurally analogous process at the level of Srotas (channels) rather than blood vessels — obstruction leading to deprivation of the tissue supplied, followed by its degeneration. Read this way, the Ayurvedic and biomedical models are not mutually exclusive but represent parallel descriptive frameworks operating at different levels of physiological granularity, with Basti therapy directed at correcting the obstructive, Vata-driven component of this process and at replenishing the depleted Dhatu through Brimhana action, rather than at any single molecular mechanism such as coagulation or lipid metabolism specifically. This integrative reading is offered as a conceptual bridge rather than a claim of mechanistic equivalence, and is consistent with the cautious, correlation-based framing adopted throughout this review.

## Materials and Methods

The clinical trial underpinning this review was a single-arm, open-label, prospective, exploratory study (design summarized in Table 5) conducted in the OPD/IPD of Dr. Sarvepalli Radhakrishnan Rajasthan Ayurveda University (DSRRAU), Jodhpur, registered with the Clinical Trials Registry of India (CTRI/2025/05/087808) and approved by the Institutional Ethics Committee (IEC: DSRRAU/PGIA/IEC/23-24/809-03.01.25). Thirty patients of either sex, aged 20–60 years, with clinical signs and symptoms of Asthi Majjagata Vata and a confirmed diagnosis of AVN by clinical evaluation and radiographic/MRI imaging, and eligible for Basti Karma, were enrolled by purposive sampling. Mean duration of illness at presentation was approximately 7.7 months (range 3–18 months).[16] Patients with uncontrolled systemic disease (hypertension, diabetes mellitus, active neoplastic disease),

conditions mimicking AVN (inflammatory arthritis, Pott's spine, bone tuberculosis, traumatic injury, bone tumour), contraindications to Basti, pregnancy or lactation, or Ficat–Arlet Stage IV disease were excluded.[16]

| Parameter | Detail |
|---|---|
| Study Type | Single-arm, Exploratory |
| Purpose | Clinical and Therapeutic use |
| Masking | Open label |
| Control | Single arm (no comparator) |
| Timing | Prospective |
| Sample Size | 30 |
| No. of Groups | 1 |

Assessment employed both subjective and objective criteria. Subjective assessment used the Harris Hip Score (encompassing Pain, Limp, Support, Distance Walked, Sitting, Public Transportation use, Stairs, use of Shoes/Socks, presence of Deformity, and Range of Motion) and a 10-cm Visual Analogue Scale (VAS) for pain, graded as shown in Table 6. Objective assessment included X-ray of the hip joint (AP and lateral views) before and after treatment, complete blood count, ESR, and MRI where indicated.[16]

| VAS Range | Grade |
|---|---|
| 0–2 | 0 |
| 2–4 | 1 |
| 4–6 | 2 |
| 6–8 | 3 |
| 8–10 | 4 |

Saghrita Ksheer Basti — prepared with Madhu (60 ml), Saindhava Lavana (12 gm), Go Ghrita as the principal Sneha Dravya (~120 ml), Shatpushpa Kalka (~15 gm), and a Ksheerpaka (~250 ml) of Manjistha, Arjuna, and Giloya, to a total volume of approximately 450 ml — was administered in Kala (Yapana Basti) pattern for 16 consecutive days. Poorva Karma comprised local Abhyanga with Tila Taila (10–15 minutes) and Nadi Swedana (5–7 minutes). During Pradhana Karma the patient was positioned in left lateral recumbency with the right leg flexed over the extended left leg, and the lubricated Basti nozzle introduced to one-quarter its length without force. Pashchata Karma involved gentle patting of the buttocks, supine repositioning with the foot end elevated, and gentle rubbing of the soles.[16] Follow-up assessment was conducted on the 15th day after completion of the 16-day treatment course. Withdrawal criteria comprised progressive worsening of disease with development of complications, and non-compliance. Statistical analysis applied parametric (paired t-test) and non-parametric (Wilcoxon Signed-Rank) tests as appropriate to the nature of each outcome variable — continuous HHS/VAS data by paired t-test, and ordinal symptom-grade data by Wilcoxon Signed-Rank test.

## Correlation With Trial Findings

Thirty patients of AVN of the femoral head (confirmed by clinical evaluation and radiographic/MRI imaging) were enrolled in this single-arm, open-label, prospective study conducted in the OPD/IPD of DSRRAU, Jodhpur. Table 7 presents the demographic and clinical profile of the study population. The majority of patients were aged 41–60 years (70%), male (76.7%), predominantly vegetarian by diet (76.7%), engaged in farming or manual labour (43.3%), and had bilateral hip involvement (50%); by Ficat–Arlet staging, most presented in Stage II (50%) or Stage III (33.3%) disease, with a minority in earlier Stage I disease (16.7%) — consistent with the generally insidious, often delayed presentation of AVN described in Section 1.

| Variable | Category | n (%) |
|---|---|---|
| Age | 20–30 yrs | 3 (10%) |
| | 31–40 yrs | 6 (20%) |
| | 41–50 yrs | 10 (33.3%) |
| | 51–60 yrs | 11 (36.7%) |

| | | |
|---|---|---|
| Sex | Male / Female | 23 (76.7%) / 7 (23.3%) |
| Occupation | Farmer/Labour | 13 (43.3%) |
| | Govt. Service | 7 (23.3%) |
| | Business | 4 (13.3%) |
| | Housewife / Other | 3 (10%) / 3 (10%) |
| Diet | Vegetarian | 23 (76.7%) |
| | Mixed / Non-vegetarian | 4 (13.3%) / 3 (10%) |
| AVN Stage (Ficat–Arlet) | Stage I / II / III | 5 (16.7%) / 15 (50%) / 10 (33.3%) |
| Side affected | Right / Left / Bilateral | 8 (26.7%) / 7 (23.3%) / 15 (50%) |

Patients were administered Saghrita Ksheer Basti in Yapana pattern for 16 days and assessed at BT, AT, and 15-day FU using VAS for Sandhishoola, graded assessment of Gaman Kashtata, Sandhigraha, and Mamsabalakshaya, and the Harris Hip Score. A paired t-test was applied to VAS, HHS, and HHS sub-scores, and the Wilcoxon Signed-Rank test to the ordinal grade parameters. Results are summarized in Table 8.

| Parameter | Mean BT | Mean AT | Mean FU | p-value |
|---|---|---|---|---|
| Sandhishoola (VAS 0–10) | 6.60 | 2.90 | 2.00 | <0.001 |
| Gaman Kashtata (grade) | 2.90 | 1.50 | 0.73 | <0.001 |
| Sandhigraha (grade) | 2.20 | 1.20 | 0.70 | <0.001 |
| Mamsabalakshaya (grade) | 4.67 | 5.00 | 5.00 | 0.0016 |
| Harris Hip Score (Total) | 62.10 | 85.17 | 88.13 | <0.001 |

A statistically significant improvement was observed across every parameter assessed ($p<0.001$ for VAS, Gaman Kashtata, Sandhigraha, and HHS Total; $p=0.0016$ for Mamsabalakshaya). Mean VAS fell from 6.60 at BT to 2.90 at AT and further to 2.00 at FU, representing sustained relief rather than a transient response. Mean Harris Hip Score rose from 62.10 (Poor range) at BT to 85.17 (Good range) at AT, with continued improvement to 88.13 at FU — indicating that functional gains were not only achieved but maintained, and in several respects improved further, in the 15 days following completion of therapy.

This pattern — of continued or sustained improvement at Follow-Up rather than reversion toward baseline — aligns with the classical expectation for a Snigdha, Brimhana Basti administered in a prolonged Yapana schedule: rather than producing rapid symptomatic suppression alone, sustained nourishment (Brimhana) of depleted Asthi and Majja Dhatu together with pacification of localized Vata (Vata-Shamana) would be expected to yield durable rather than transient benefit, consistent with the therapeutic mechanism described in Section 3.

## Harris Hip Score: Sub-Domain Analysis

Disaggregating the Harris Hip Score into its component sub-domains clarifies which functional dimensions improved most. As shown in Table 8, the largest relative gains were in Limp (79.6% improvement) and Distance Walked (39.0%), with more modest — though still statistically significant — gains in Range of Motion (11.9%) and Pain (32.9%).

| HHS Sub-domain | Mean BT | Mean AT | % Improvement | p-value |
|---|---|---|---|---|
| **Pain** | 28.33 | 37.67 | 32.9% | <0.001 |
| **Limp** | 5.23 | 9.40 | 79.6% | <0.001 |
| **Distance Walked** | 5.90 | 8.20 | 39.0% | <0.001 |
| **Range of Motion** | 4.20 | 4.70 | 11.9% | <0.001 |

The disproportionate improvement in Limp and Distance Walked relative to Range of Motion is consistent with the classical framing of Asthi Majjagata Vata treatment as primarily Brimhana (nourishing/restorative) and Vata-

Shamana rather than a purely Shodhana-type or mechanically corrective intervention: sustained tissue nourishment and pain relief would be expected to translate into improved gait and endurance more readily than into a mechanical increase in joint range within a 16-day treatment window, particularly where structural (radiographic) change is not expected to occur so rapidly.

## Stage-Wise Response

Response was analysed by Ficat–Arlet stage at presentation (Table 9). All stages showed substantial mean improvement in HHS from BT to AT, with the magnitude of improvement broadly comparable across Stage I, II, and III disease (52.8%–62.1%).

| Ficat–Arlet Stage | n | Mean % Improvement in HHS (BT→AT) |
|---|---|---|
| Stage I | 5 | 52.8% |
| Stage II | 15 | 60.4% |
| Stage III | 8 | 62.1% |
| Mixed (asymmetric bilateral) | 2 | 60.2% |

The comparable response across stages — rather than a sharp decline in efficacy with advancing stage — may be read as consistent with the classical understanding that Saghrita Ksheer Basti acts primarily through Vata-Shamana and Dhatu-Brimhana rather than through structural correction of already-collapsed bone; symptomatic and functional relief may accordingly be achievable even in more advanced (Stage III) disease, though this should not be read as evidence that the underlying structural pathology is reversed, and radiological correlation would be needed to establish that separately.

## Comparison With Previously Reported Ayurvedic Studies

The synopsis for the present trial situates this work among several previously reported Ayurvedic studies on AVN of the femoral head and related Asthi-Dhatu-Kshaya conditions, summarized in Table 10. These range from single case studies and case reports to a comparative clinical trial, and employ a range of Basti formulations including Guduchyadi Yapana Basti and Panchatikta Ksheera Basti.[14] While a formal statistical comparison across these heterogeneous studies is beyond the scope of the present review, their consistent direction of reported benefit — irrespective of the specific Basti formulation used — lends further support to the general classical principle that Basti-based Vata-Shamana and Brimhana therapy is beneficial in Asthi Majjagata Vata / AVN, while also underscoring the need for larger comparative trials to establish which specific formulation offers superior or more durable benefit.

| S.N. | Study | Intervention | Design |
|---|---|---|---|
| 1 | A case study on the effect of Guduchyadi Yapanbasti in AVN of hip joint | Guduchyadi Yapana Basti | Case study |
| 2 | Role of Ayurveda in the conservative management of AVN of the femoral head | Multimodal Ayurveda | Case study |
| 3 | Ayurvedic management of Asthidhatu Kshaya | Comparative protocol | Comparative clinical trial |
| 4 | Ayurvedic management of AVN of neck of femur w.s.r. to Asthi Majjagata Vata | Ayurveda protocol | Clinical study |
| 5 | AVN (associated with sickle cell anaemia and beta thalassemia minor) management through Ayurveda | Ayurveda protocol | Case report |
| 6 | Ayurvedic management of AVN of the femoral head | Ayurveda protocol | Preliminary study |
| 7 | Effect of Panchatikta Ksheera Basti in the management of AVN of head of femur | Panchatikta Ksheera Basti | Case study |

## Radiological Correlate

Although formal statistical analysis of radiological staging was outside the scope of the present review, descriptive X-ray/MRI findings recorded at AT are summarized in Table 11. No patient demonstrated radiological progression of the AVN lesion over the 16-day treatment period, and in a subset of patients MRI additionally noted improved vascularity — an observation that, while descriptive rather than statistically powered, is consistent with the absence of structural deterioration alongside the functional and symptomatic gains reported above, and offers a preliminary, non-quantitative signal in support of the disease-stabilising potential of the intervention alongside its symptomatic benefit.

| Radiological Finding at AT (X-ray/MRI) | n | % |
|---|---|---|
| No progression of AVN lesion | 6 | 20% |
| No significant progression of AVN | 6 | 20% |
| No significant change in radiological finding | 6 | 20% |
| No progression; MRI follow-up advised | 6 | 20% |
| MRI: No progression, improved vascularity noted | 6 | 20% |

## Compliance and Completion

All 30 enrolled patients completed the full 16-day Basti course and the 15-day Follow-Up assessment; none met the pre-specified withdrawal criteria of progressive disease worsening with complication or non-compliance.[16] This complete follow-up (zero attrition) strengthens confidence that the BT-AT-FU comparisons reported in Sections 5–5.4 reflect the trial's full enrolled cohort rather than a subset of completers, and is itself indirectly suggestive of acceptable tolerability of the 16-day Yapana Basti schedule in this patient population, though formal adverse-event recording and grading was not a specific focus of the present review and should be reported separately in the primary trial publication.

## Discussion

The clinical picture recorded at baseline in this trial — Sandhishoola, Gaman Kashtata, Sandhigraha, and Mamsabalakshaya — corresponds closely with the classical Lakshanas of Asthi Majjagata Vata (Bheda Asthiparvanam, Sandhi Shoola, Satata Ruk, and Mamsabalakshaya) described in Section 2, supporting the validity of the Asthi Majjagata Vata–AVN correlation as a diagnostic and therapeutic framework for this trial. The improvement observed in both subjective (VAS, symptom grading) and objective (HHS) parameters following Saghrita Ksheer Basti corroborates the specific classical indication of Ksheera-Sarpi Basti for Asthigata Vata (Ch. Su. 28/27) and the Ubhaya Sneha (external and internal oleation) principle for Asthi-Majjagata Vata (Ch. Chi. 28/93) discussed in Section 3.

From a contemporary standpoint, Ghrita and Ksheera possess documented anti-inflammatory and tissue-nourishing properties, and Manjistha, Arjuna, and Giloya are individually described in pharmacological literature for anti-inflammatory, vascular-tonic, and immunomodulatory actions respectively; these may offer plausible modern correlates for the Vata-Shamana and Dhatu-Brimhana effects described classically, though this correlation remains inferential rather than mechanistically established within the present study design.

The Sadhya-Asadhyata framework discussed in Section 2.3 also offers a useful lens for interpreting the stage-wise findings in Section 5.2: the trial's comparable response across Ficat–Arlet Stages I–III is consistent with a Kricchasadhya (difficult but not incurable) rather than Asadhya (incurable) prognosis for AVN when managed within the classical Basti framework, provided treatment is undertaken before the Bheda Avastha of Shadkriyakala — corresponding to Stage IV disease — is reached; the present trial's exclusion of Stage IV patients was accordingly consistent with this classical prognostic principle. Equally, the sub-domain pattern in Table 8 — greater relative gains in Limp and Distance Walked than in Range of Motion — supports the interpretation of Saghrita Ksheer Basti as acting principally through Vata-Shamana and Dhatu-Brimhana (functional and symptomatic restoration) rather than through mechanical or structural correction of the joint, a distinction with

direct relevance to how such therapy should be positioned relative to surgical options: as a conservative, function-preserving measure rather than a substitute for structural intervention where the latter is indicated.

Compared with previously reported Ayurvedic studies on this condition (Table 10), which have similarly reported benefit from a range of Basti-based interventions, the present trial adds a comparatively larger single-arm sample (n=30) with formal paired statistical testing across multiple validated outcome measures and disaggregated sub-domain and stage-wise analysis not typically reported in the case-study literature. Nonetheless, several limitations should be acknowledged: the single-arm, open-label design precludes control for placebo response or natural symptom fluctuation; the 15-day Follow-Up window, while showing sustained or improving benefit, is short relative to the natural history of AVN, which may progress over months to years; radiological correlation (X-ray/MRI) was collected as part of the trial protocol but is not analysed within the scope of the present review; and the single-centre design limits generalisability. Larger, multi-centric, ideally comparative trials with longer follow-up and radiographic outcome correlation are recommended to more definitively establish the role of Saghrita Ksheer Basti in the conservative management of AVN of the femoral head.

## 6.1 CLINICAL IMPLICATIONS

For the practising Ayurvedic physician, these findings suggest that Saghrita Ksheer Basti in Yapana pattern may reasonably be offered as a conservative, symptom- and function-improving option for patients with early-to-moderate (Ficat–Arlet Stage I–III) AVN of the femoral head, particularly where the patient wishes to defer or avoid arthroplasty, provided Stage IV disease and the standard exclusion criteria outlined in Section 4 are respected. The observed sub-domain pattern — greater gains in gait-related parameters (Limp, Distance Walked) than in Range of Motion — suggests that patient counselling should frame expected benefit primarily in terms of pain relief and functional independence in ambulation rather than a marked increase in hip mobility per se, at least within a 16-day treatment and 15-day follow-up window. For the orthopaedic community, the descriptive absence of radiological progression alongside functional improvement (Section 5.4) may be of interest as a signal — albeit preliminary — warranting formal investigation of Ayurvedic Basti therapy as an adjunct or bridge measure in the conservative window before joint-preserving or replacement surgery becomes the only remaining option.

## Strengths

The principal strengths of the trial underpinning this review include: a defined and reproducible Basti formulation and Yapana schedule, permitting replication by other centres; use of a validated, widely recognised functional outcome measure (Harris Hip Score) alongside a subjective pain scale (VAS) and classically-derived symptom grades (Gaman Kashtata, Sandhigraha, Mamsabalakshaya), allowing the trial's findings to be read from both a modern-clinical and a classical-Ayurvedic perspective; formal statistical testing (paired t-test and Wilcoxon Signed-Rank test) appropriate to the type of each outcome variable rather than descriptive reporting alone; and disaggregated sub-domain and Ficat–Arlet stage-wise analysis, providing more granular insight than is typically available from single case reports in this area.

## Limitations

Equally, several limitations warrant explicit acknowledgement. The single-arm, open-label design without a comparator (placebo, standard-care, or alternative-Basti) arm precludes any causal claim that the observed improvement is specifically attributable to Saghrita Ksheer Basti rather than to natural symptom fluctuation, regression to the mean, or non-specific effects of clinical attention and Panchakarma procedure. The 15-day Follow-Up window, while demonstrating sustained or further improvement rather than relapse, remains short relative to the months-to-years natural history of AVN, and does not establish whether benefit persists over a clinically meaningful longer term. Radiological correlation (X-ray and MRI) was collected as part of the trial protocol but has not been statistically analysed within the scope of the present review; incorporating structural imaging outcomes in future analysis would materially strengthen the evidentiary basis for any claim of disease-modifying (as opposed to purely symptomatic/functional) benefit. Finally, the single-centre design and modest sample size (n=30) limit generalisability to other patient populations and practice settings.

## Future Directions

Building on the present findings, future work should prioritise: (a) randomized, comparator-controlled trials — ideally against standard conservative orthopaedic management or an alternative Basti formulation — to isolate the specific contribution of Saghrita Ksheer Basti; (b) extended follow-up, at minimum to 3–6 months, to establish durability of benefit; (c) formal radiological outcome analysis (Ficat–Arlet or ARCO stage migration, MRI-based marrow signal change) as a co-primary or secondary structural endpoint; (d) multi-centric recruitment to improve generalisability and statistical power; and (e) exploration of the individual and combined pharmacological actions of the Kwatha constituents (Manjistha, Arjuna, Giloya) using contemporary biochemical or imaging biomarkers, to build an evidence bridge between the classical Samprapti-based rationale presented in Section 2–3 and modern mechanistic understanding of AVN.

## Conclusion

The classical Ayurvedic understanding of Asthi Majjagata Vata — its Samprapti through Vata-mediated depletion of Asthi and Majja Dhatu, its staged progression through Kriyakala, and its specific classical indication for Ksheera-Sarpi Basti — provides a coherent conceptual basis corresponding closely with the pathology and clinical presentation of avascular necrosis of the femoral head. Saghrita Ksheer Basti administered in Yapana Basti pattern produced statistically significant and sustained improvement in both subjective symptoms and Harris Hip Score across a 30-patient trial, with complete follow-up and no radiological progression of disease, lending clinical support to this classical rationale. Taken together, the classical textual analysis and the trial's clinical, functional, and descriptive radiological findings converge on a consistent picture: Saghrita Ksheer Basti in Yapana pattern is a rationally grounded, clinically effective, and well-tolerated conservative measure for AVN of the femoral head within the stages studied. Larger, multi-centric trials with longer follow-up, a comparator arm, and formal radiological correlation are recommended to further validate these findings and to establish Saghrita Ksheer Basti as an evidence-based conservative option in the management of AVN of the femoral head.

## Author Contributions

Concept, clinical trial conduct, and data collection: Om Prakash Chaudhary, under the guidance of the Supervisor and Co-Supervisors of the underlying dissertation. Classical textual review, drafting, and statistical interpretation for the present review article: Om Prakash Chaudhary. All authors reviewed and approved the final manuscript.

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