

Ayurvedic Management of Avascular Necrosis of Head of Femur: A Case Report

TANIKA YADAV¹, VAISHALI KUCHEWAR², PANKAJ YADAV³

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ABSTRACT

Avascular Necrosis (AVN) is a pathological condition characterised by a reduction in the blood supply to the subchondral bone, leading to the degenerative condition of the bone, marked by the death of cellular components of the bone. It is also known as osteonecrosis. The epiphysis of long bones at weight-bearing joints is typically affected. All of these conditions have a poor prognosis. In Ayurveda, it corresponds to *Asthivahastrotodushtivikara* (musculoskeletal disorder) as there is *kshaya* (necrosis) of *asthi* (bone) and *Majja* (bone marrow) *dhatu* (major structural components of the body). In modern medicine, AVN is managed by the use of corticosteroids and many surgical procedures such as drilling, insertion of prosthetics, or bone grafts. Therefore, *Ayurveda* provides a conservative line of treatment based on the principle of *Asthi-majjagatkashaya* (decalcification of bone) caused by *abhighatajanyaavataprakopa* (trauma). A case of AVN with the right femoral head was treated with *shaman* (oral medications), *Sodhana* (bio-purification), and *bruhmana* (rejuvenation) procedures. The therapy provided significant improvements in pain and range of movement of the hip joint, based on the patient's signs and symptoms before and after treatment. Conservative treatment can give outstanding results, improve the quality of life, halt disease progression, and help manage AVN by tissue regeneration without harmful effects.

Keywords: *Asthi dhatu, Bruhmana, Kshaya, Musculoskeletal disorder, Sodhana*

CASE REPORT

A 36-year-old female reported to the outpatient department of Kayachikitsa with complaints of pain in the right hip joint, difficulty in walking, standing for long periods, sitting, and climbing stairs for one month. She had a history of a fall one month prior, after which she began experiencing mild pain in her right hip joint. After a few days, her pain gradually aggravated for which she consulted an orthopaedic surgeon who diagnosed her with AVN of the right femoral head with joint effusion based on Magnetic Resonance Imaging (MRI). She was advised for surgery but as she was not willing, she sought *Ayurvedic* management from this department. Clinical examination was done based on *Ayurvedic* parameters [Table/Fig-1,2].

S. No.	Examination	Observation
1	Nadi (pulse rate)	72/min
2	Mala (bowel)	Once in a day, regular, Nirama (no mucous present)
3	Mutra (frequency of urine)	5-6 times per day
4	Jivha (tongue)	Nirama (not coated)
5	Shabda (speech)	Spasta (clear)
6	Sparsha (touch)	Anushnasheeta (normal)
7	Drika (vision)	Prakrita (No pallor/Icterus present)
8	Akriti (body built)	Madhyam (medium)

[Table/Fig-1]: Ashtavidha Pariksha (eight fold of examination).

She was a vegetarian with a normal appetite, and her bowel habits were normal, but her sleep was disturbed due to pain. On clinical examination, mild tenderness was noted in the right hip region, along with a decreased range of movement in the hip. Internal rotation of the hip joint was painful on the right-side. Investigations like Complete Blood Count (CBC) and blood sugar levels were within normal limits.

Assessment Criteria

- 1) The pain was assessed using the Visual Analogue Scale (VAS) [1], which scored an eight. The Straight Leg Raising (SLR) test

S. No.	Examination	Observation
1	Prakruti (constitution of the patient)	Vata-Pitta
2	Vikruti (pathological variations)	Vatadosha, Asthi-Majja dhatu, Raktavaha strotodushti
3	Sara (quality of tissues)	Madhyam (average)
4	Samhain (built of the body)	Madhyam (average)
5	Praman (anthropometric measurements)	Weight-45 kg, Height-5 feet 2 inches, BMI-18.1 kg/m ²
6	Satmya (adaptability)	Madhyam (average)
7	Satva (mental strength)	Pravar (high)
8	Aahar Shakti (food and digestion capacity)	Madhyam (average)
9	Vyayam Shakti (exercise capacity)	Avar (Poor)
10	Vaya (age)	Yuva Avastha (young age)

[Table/Fig-2]: Dashvidhapariksha (Ten folds of Examination).

was positive. After abduction of the hip joint up to her total capacity, the distance from the right toe to the left toe [Table/Fig-3] was 53 cm with pain.

- 2) Internal rotation of the right hip joint was painful up to 60°, and external rotation of the right hip joint was also painful up to 60°.



[Table/Fig-3]: Measurement of distance from right to left greater toe.

Timeline of Treatment

She was diagnosed as a case of *Asthi-Majja-gata Vata* and was treated according to *Ayurveda* treatment principles for five months. Medicines and *Basti* (medicated enema) treatment were administered for *Strotoshodhan* (detoxification of body channels) to improve local blood circulation and nourish the *Asthi Dhātu* (bone) [2]. According to Acharya Vagbhata, in *Asthi Kshaya*, *Basti* containing *Ksheer* (milk), *Ghrita* (clarified butter), and *Tikta Rasa* (bitter taste) should be administered [3].

As per above principle, *Shaman chikitsa* (oral medication) was given for one month while the patient was admitted to the ward. She got mild relief in symptoms. Upon discharge, she was advised oral medication for three months along with *Pathya Sevana* (healthy regime) [Table/Fig-4].

S. No.	Name of medicines	Duration
1	Cap <i>Ksheerbala</i> once a day before meal in morning	One month
2	<i>Shiv Gutika</i> 500 mg thrice a day after meals, once a day	Two months Three months
3	<i>Panchtikta Ghrita Guggulu</i> 250 mg twice a day after meals	Two months
4	<i>Mahamanjisthadi Kwath</i> 20 mL twice a day after meals	Two months
5	Tab <i>Me-cal</i> 500 mg twice a day after meals	Two months
6	Tab <i>Hadjod</i> 500 mg once at night after meal	Two months
7	<i>Amalaki Rasayana</i> 3 gm once in morning	Three months
8	<i>Lakshadi Guggulu</i> 250 mg twice a day	Three months
9	<i>Guduchi Ghan Vati</i> 250 mg once a day	Three months

[Table/Fig-4]: Shaman treatment plan.

Shodhana Basti (medicated enema) was given in the form of *Manjisthadikwathbasti* (therapeutic enema) in a *Yoga Basti* schedule for 10 days. *Shastishalipindsweda* (red rice sudation) was given as *Brumhanachikitsa* (Rejuvenation) for 10 days [Table/Fig-5].

S. No.	Shodhana chikitsa	Drugs	Duration
1	<i>Snehan</i> (body massage)	With <i>ksheerbala</i> oil	15 days
2	<i>Pinda swedan</i>	<i>Shastishali</i> (red rice)+ <i>ashwagandha</i> Powder+ <i>panchikttaghrita</i> + milk	10 days
3	<i>Matra Basti</i> (medicated enema)	<i>Ksheerbala</i> oil (20 mL)+ <i>Panchtikta ghrita</i> (30 mL)	10 days
4	<i>Niruhabasti</i>	Decoction of <i>Dashmool Bharad</i> 20 gm+ <i>Guduchi</i> powder (10 gm)+ <i>Kalka</i> of <i>manjistha</i> powder (30 gm) and <i>Arjun</i> powder (20 gm)+ <i>Saindhava</i> (10 gm)+ <i>Honey</i> (30 mL)+ <i>Sahachar</i> oil (50 mL)	10 days
5	<i>Nirgundi Patra pottli swedan</i>	Over lumbar, hip, and thigh region at night	1 month

[Table/Fig-5]: Panchkarma procedure.

Observation

Clinically, there was a significant improvement in symptoms such as pain and tenderness. The range of motion of the right hip joint showed significant improvement [Table/Fig-6]. But there were no significant changes observed in the MRI report.

Follow-up and Outcome

After 10 days of the *Yoga Basti* plan, the patient got mild relief in symptoms. She was able to sit in a squat position, and the SLR test increased from 60 to 80°. After follow-up of three months, she got complete relief. Her pain score became zero, she achieved complete flexion and abduction of the leg without pain, and internal and external rotation became painless [Table/Fig-7]. Currently, the patient is off treatment and is keeping well.

Assessments	Before treatment	After treatment
Pain	8	0
Straight Leg Raising (SLR) test	60°	80°
Flexion	With pain	Without pain
Abduction	53 cm	85 cm
Internal rotation	60 (pain)	80 (no pain)
External rotation	60 (pain)	70 (no pain)

[Table/Fig-6]: Observations of assessment parameters.



[Table/Fig-7]: Abduction of right leg before and after treatment.

DISCUSSION

The AVN is a pathological condition caused by an interruption of subchondral blood supply, which results in degenerative bone condition characterised by the death of cellular components of the bone [4]. It is also known as osteonecrosis, aseptic necrosis, or ischaemic bone necrosis [5]. Typically, the epiphysis of long bones at weight-bearing joints is affected. Common sites of AVN include the femoral heads, humeral head, and knee joints it can affect both the bone and surrounding structures. The aetiology can be traumatic or non traumatic. Non traumatic AVN is caused by the blockage of blood vessels due to intravascular or outer compression of blood vessels, limiting blood flow to the femoral head [6]. Traumatic AVN is caused by an injury that disrupts blood supply. The most typical type of bone necrosis is AVN of the femur head, manifesting as a radiolucent band with demineralisation of unaffected bone in the fibrous zone and mottled area. The main issue is reduced blood flow to the bone or malnutrition of the bone. The femoral head portion has very little arteries that nourish it, making it more vulnerable to injury and eventual femur disintegration [6]. AVN can be caused by the use of systemic steroids, certain inflammatory diseases like vasculitis, systemic lupus erythematosus, smoking, sickle cell disease, coagulopathy, infections like Human Immunodeficiency Virus (HIV), tuberculosis, and meningococcal infection [7]. It mainly affects people in the age group of 30 to 50 years. Epidemiological data from the United States estimate the prevalence of AVN of the hip joint in the general population to be around 300,000 to 600,000 cases in the early 2000s, with about 10,000 to 20,000 new cases occurring every year [8].

In *Ayurveda*, there is no direct reference to AVN as a specific ailment. It may correspond to *Asthi-majja-gata-vata* (musculoskeletal disorder), elucidated under *Vatavyadhi*. Its symptoms include *Bhedoasthiparvanam* (bone-breaking pain), *Sandhi Shula* (joint pain), *Mamsakshaya* (muscle wasting), *Balakshaya* (weakness), *Aswapna Santataruka* (disturbed sleep due to continuous pain), *Sandhi Shaithilyam* (loosening of joints), and *Shiryantiva Cha Asthi nidurbalani* (generalised weakness due to destruction of bony tissue) [9]. *Asthi-majja-vahastrodushti* (musculoskeletal disorder) may occur due to *abhighata* (trauma) or *margavrodha* (obstruction), resulting in bone necrosis. In modern medicine, AVN is managed by the use of corticosteroids many surgical procedures such as drilling, insertion of prosthetics, or bone grafts. These procedures are costly and often have a poor prognosis. Therefore, a conservative treatment approach was chosen based on the principle

of *Asthi-majja-gata-kashaya* (decalcification of bone) caused due to *abhighatajanya-vata-prakopa* (trauma). It was considered that there is an involvement of *Vata dosha*, *asthi-majja dhatu vikriti*, and *raktavaha-strotodushti*. This case of AVN in the right femoral head was treated with *shaman* (oral medications), *Sodhana* (bio-purification), and *bruhmana* (rejuvenation) procedures [10].

Chaturvedi A et al., conducted a study on AVN in which *Shodhan* and *Shaman Chikitsa* was given [10] but no *Brumhaniya Chikitsa* was used to give strength to the bones, which is a unique aspect of this study. In present case, there was a history of a fall considered as traumatic aetiology, due to trauma, the patient started experiencing pain in the hip joint. Therefore, this case was treated based on the classical principles of *Ayurveda*, considering the *Kashya* of *Asthi Dhatu*, *Brumhaniya Therapy*, and *Rasayana Therapy*. *Strotoavarodha* (microchannel blockages), *Ayurveda*, can be used to explain pathogenesis due to the lack of blood flow to the hip joint or the head of the femur. *Ayurveda* claims that this condition is similar to *Asthi-majja-gata-vata* (AVN). Joint pain may gradually worsen, limiting one's range of motion. The first line of treatment for *Vata Dosha*, (the regulating functional element responsible for movement and cognition) the *dosha* responsible for movement and digestion, is "*Basti*" (medicated enema). Additionally, it is explained for *Rakta*, (the body's blood-regulatory functional factor) *Kapha Dosha*, and *Pitta* (the factor in charge of regulating body temperature and metabolic activity) [11]. Along with *Srotoshodhana* (detoxification), *Dosha Vilyana* (releasing of toxins) takes place, which aids in reducing *Margavarana* of *Vata*. It enters the minute pathways of *Srotasas* (channels), hence pacifying *Vata Dosha*. The qualities of *Ushna* (hot), *Ruksha* (dry), and *Tikshna* (strong) serve to appease *Sheeta* (cold) and *Snigdha* (soothing) of *Kapha* [12]. Keeping the above *Ayurvedic* principles in mind, the following treatment was planned and significant results were shown in this case. The patient's quality of life improved, and she was able to perform her daily chores without any discomfort. Pain and tenderness disappeared, and the range of motion of the right hip joint also improved after treatment. However, there was no significant improvement shown in the X-ray and MRI reports.

Cap Ksheerbala is an excellent medicine for rejuvenation that fortifies the bones and joints, specifically calming the *Vata* and *Pitta doshas* [13]. *Shiv Gutika* contains *Shilajatu* (*Asphaltum Punjabiannum*) as its main content, helping to strengthen the bones by increasing the uptake of minerals like calcium, magnesium, and phosphate into the tissues of the bones and muscles. It reduces the risk of bone fragility and fractures. Humic acid, a key component, greatly reduces blood lipids, preventing fat deposits in the blood arteries and heart vessel obstruction. The reference for *Shiv Gutika* comes in the *Shilajatu Prakarana* of the *Chakradutt* book, where Lord Shiva revealed this *Rasayana* to Lord Ganesha, hence the name *Shiv Gutika* [14]. *Panchtikta Ghrita Guggulu* has a *Katu* (pungent) and *Tikta* (bitter) taste, is *Laghu* (easy to digest), *Rooksha* (dry), *Vishada* (brings clarity), *Sukshma* (microscopic), *Sara* (brings movement), *Katu* (pungent), *Vipaka* (post-digestive effect), and hot in potency. *Guggulu*, on the other hand, has *Lekhana* (scraping and clearing the channels) properties, balances *Tridoshas*, and increases digestive power. It is extremely helpful in treating diseases like *Asthikashaya* and *Asthi-Majjagat Vata* (musculoskeletal disorders) as it serves as a "*Srotoshodhak*" (purifying agent) [15]. *Mahamanjisthadi Kwath* is an *Ayurvedic* supplement that helps purify the blood, effectively maintaining *Pitta* vitiation and balancing *Vata* and *Kapha doshas* [16]. *Tab Me-cal* is a unique blend of calcium, magnesium, strontium, and protein with *Kukkutandtwak* (eggshell) as its main content, stimulating chondrocyte differentiation and cartilage growth. It reduces pain, osteoresorption, and increases bone density in cases of osteoporosis and senile osteoporosis [17]. *Tab Hadjod* (*Cissus quadrangularis*) speeds up the healing of fractures by lowering pain, oedema, and fracture mobility [18]. *Amalaki Rasayana*, made from *Embilica officinalis*, includes all *Rasas* (tastes) except *Lavana Rasa* (salty taste),

Laghu (light), *Ruksha* (dry) *gunas* qualities, *Madhura* (sweet) *Vipaka* (post-digestion effect), and *Sheeta* (cooling) *Virya* (effect). *Rasayana* is a form of *Swathsyauryaskara Bhesaja* (rejuvenating medicine) that works to improve health by boosting immunity and treating ailments. *Rasayana* aims for achieving great *Rasa* and other *Dhatus*, long life, youthfulness, memory, immunity, intelligence, strength of body organs, and intelligence [19].

Lakshadi Guggulu: Due to its anti-inflammatory characteristics, *Guggulu* (*Commiphora wightii*) has properties such as *Shothahara* (anti-inflammatory) and *Bhagna Sandhanakara* (fracture mending), while *Laksha* (*Lacifer Lacca*) has properties such as *Bhagnasandhana* (bone healing) and *Vranaropaka* (wound healing). Additionally, *Guggulu* preparation eases discomfort by pacifying vitiated *Vata dosha*.

Guduchi Ghan Vati: *Guduchi* (*Tinospora cordifolia*) has a bitter flavour, light (*Laghu*), and unctuousness (*Snigdha*) qualities, which aid in boosting digestive capacity and acting as an anti-inflammatory, giving muscles power and relieving joint and muscle discomfort.

Snehan (body massage): Massage is said to help both *Vata* and *Kapha dosha*, as described by Acharya Sushrut in *Chikitsa Sthana*. Oil massage aids in pacifying the *Doshas* because *Asthikashaya* is mostly due to the predominance of *Vata* and *Kapha Doshas*.

Swedan (sudation therapy): *Shastishali* (red rice)+*Ashwagandha* (*Withania somnifera*) powder+*Panchatikta Ghrita*+milk *Pinda Sweda*. It is a type of *Brimhana* (bulk-promoting), *Vatahara*, and *Balya* (strengthening) *Sweda*. By virtue of its contents, including *Godugdha* (cow's milk) and *Shashtikashali*, it provides nourishment to nervous tissues and gives muscles power. Following the administration of therapeutic heat, vasodilation occurs, which improves blood circulation and aids in the removal of waste materials. Anabolism increases as tissue gets the nourishment and oxygen. Sudation can alleviate tension and increase the range of motion by reducing stiffness and increasing tissue elasticity. The *Shashtikashali Pinda Sweda* technique increases tissue strength, resulting in more fluid motions [20].

Matra Basti (unctuous enema) is considered the best treatment mentioned in *Chikitsa* for *Vata Rogais Basti*. The major component of *Kshir Bala Tail* is *Bala* (*Sida cordifolia*) which is a strong neuroprotective herb that soothes pain and muscle stiffness, making it highly beneficial in *Asthikashaya*. Acharya Charak mentioned that 'in diseases of *Asthi*, *Basti* should be given using *Tikta Rasatmaka Aushadhi Dravya* (bitter-tasting medicine) along with *Ghrut* (clarified butter) and *Ksheer* (milk) that is *Saghrat Tikta Ksheer Basti*.' *Tikta Rasa* (bitter taste) is predominantly composed of the physical elements *Vayu* (air) and *Akash* (ether/space). It contains *Tikta Rasa Pradhan Dravyas*, a substance with *Prithvimahabhuta* (earth physical element), which aids in the growth and nourishing of bones. It has been shown to be helpful in *Asthikashaya* (bone decalcification) since it is *snigdha* (soothing), *balya* (strengthening), and *brumhan* (increasing bulk) [21].

Niruhabasti (decoction enema) consists of a Decoction of *Dashmool* *Bharad* (20 gm), *Guduchi* (*Tinospora cordifolia*) powder (10 gm), *Kalka* (paste) of *Manjistha* (*Rubia cordifolia*) powder (30 gm), *Arjun* (*Terminalia arjuna*) powder (20 gm), *Saindhava* (rock salt) (10 gm), honey (30 mL), and *Sahachar* oil (50 mL) for effective illness control, bone strengthening, healing, and to prevent relapse. The therapy provided significant improvements in pain and the range of movement of the hip joint.

Based on the patient's signs and symptoms before and after treatment, symptomatic improvement was seen. Conservative treatment gave outstanding results and improved the quality of life.

CONCLUSION(S)

Panchkarma therapy may be an alternative for AVN management without surgical intervention. Through *Ayurveda*, early diagnosis can be made, increasing the likelihood of a better prognosis.

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PARTICULARS OF CONTRIBUTORS:

1. Postgraduate Scholar, Department of Kayachikitsa, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Salod (H), Datta Meghe Institute of Higher Education and Research (Deemed to be University), Wardha, Maharashtra, India.
2. Professor, Department of Kayachikitsa, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Salod (H), Datta Meghe Institute of Higher Education and Research (Deemed to be University), Wardha, Maharashtra, India.
3. Postgraduate Scholar, Department of Kayachikitsa, Mahatma Gandhi Ayurveda College, Hospital and Research Centre, Salod (H), Datta Meghe Institute of Higher Education and Research (Deemed to be University), Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Ms. Tanika Yadav,
Postgraduate Scholar, Department of Kayachikitsa, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Salod (H), Datta Meghe Institute of Higher Education and Research (Deemed to be University), Wardha-442001, Maharashtra, India.
E-mail: tanikaydv12@gmail.com

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