



Original Research Article

An Ayurveda approach in the management of avascular necrosis of bilateral hip joint-A case report

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ARTICLE INFO

Article history:

Received 23 January 2023

Received in revised form

12 July 2023

Accepted 2 August 2023

Available online xxx

Keywords:

Avascular necrosis

Asthimajagata-vata

Rasayana

Vatavyadhi

ABSTRACT

Avascular necrosis (AVN) is the condition where an interruption of the sub-chondral blood supply leads to the death of cellular components of bones typically at the weight-bearing joints. Here we present a case of a 48 years old male patient suffering from AVN for the last two months. The patient had pain in bilateral hip joints which was gradually radiating to the bilateral thigh. The patient also felt difficulty in cross-legged, sitting, and squatting. The Ayurveda diagnosis of the case was established as *Asthimajagata-vata* (~disease due to vitiation of *Vatadosha* in bone and bone marrow tissues). Oral treatment was administered initially for eight months, followed by a course of *Panchatikta-kshira basti* (medicated enema enriched with milk) and *Shalishastika panda swedana* (a specific type of sudation with a poultice of rice bolus) for 24 days. Oral medications were continued during this duration and also for the subsequent 22 months. *Kaishora guggulu* in the dose of 750 mg twice a day with *Dashamula kwath* 40 ml twice a day, *Ashwagandha churna* (Powder of *Withania somnifera* Dunal) 3 g, *Guduchi churna* (Powder of *Tinospora cordifolia* L.) 1g, *Chopchini churna* (Powder of *Smilax china* L.) 2g and *Shilajatwadi loha* 500 mg with milk twice a day were advised to the patient. MRI scans of bilateral hip joints after 23 months of this treatment revealed changes in AVN grade, with the left hip joint transitioning from grade III-B to grade II, and the right hip joint progressing from grade IV-A to grade III. The range of motion at these joints was also improved significantly. Most of these medicines are *Rasayana* (~immune-modulatory) in nature. The present case study suggests that *Panchakarma* procedures and *Rasayana* may be used for the treatment of AVN.

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1. Introduction

Avascular necrosis (AVN) is the condition where an interruption of the sub-chondral blood supply leads to the death of cellular components of bones particularly of the epiphyseal region of weight-bearing joints [1]. The disease is also called osteonecrosis. The capital epiphysis of the femur is commonly affected by the disease and patients aged between 35 years and 65 years are mostly affected. One study indicated an 8% prevalence rate of avascular necrosis and the time of AVN diagnosis was ranging from 18 to 54 years of age [2]. Males are more affected by AVN of the femoral head. Vascularised bone grafts or biological agents and joint salvaging procedures such as core decompression have varying

results and hip arthroplasty is ultimately needed for many patients which itself has various complications. Here we present a case of AVN of bilateral hip joints which were treated on the line of Ayurveda management after a long follow-up, the patient had got relief in symptoms and there was also regression in the radiological grading of the disease. The case was considered to be suffering from *Asthimajagata-vata* (~disease due to vitiation of *Vata dosha* in bone and bone marrow tissues) [3] where *Asthi* and *Majja* were affected and he was treated on the line of management of *Vatavyadhi* (~various musculoskeletal diseases due to *Vata dosha*).

2. Patient information

A 48-years-old male patient visited the hospital of the National Institute of Ayurveda Jaipur on 21st July 2020 for a complaint of pain in bilateral hip joints and difficulty in walking for two to three months. The pain gradually radiated over the bilateral thighs for the last two months. The pain was dull and aching in nature and not

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Peer review under responsibility of Transdisciplinary University, Bangalore.

relieved by rest. The patient also felt difficulty in cross-legged, sitting, and squatting. He visited a private hospital in Jaipur on 22nd June 2020 for the same complaints where he was diagnosed with AVN of bilateral hip joints and advised for magnetic resonance imaging (MRI) of bilateral hip joints. He had a history of removal of a brain cyst in 2016 but the patient had no document to disclose the details. The patient had no history of COVID-19 infection. The patient also had a history of smoking 8 to 9 cigarettes/per day for the last 15 years and was an occasional drinker. He had been advised some oral medication at the outpatient door level for initial eight months and was admitted to the *Panchakarma* indoor patient ward on 12/02/21.

3. Clinical findings

On general examination at the time of the first visit, the vital signs of the patient were normal. The height of the patient was 167 cm and the weight was 90 kg. The patient was slightly anxious with disturbed sleep and had a moderate appetite. The patient felt pain in the bilateral iliac regions, and bilateral hip joints, and pain was radiating up to the knee joints. On neurological examination of both the lower limbs' reflexes and sensations, testing was normal (clinical examinations were done with the help of tendon hammer and pin). Motor examination was also normal. Tenderness (assessed clinically by palpation and graded on the basis of pain pressure pain threshold scale) of grade 2 was present over the bilateral iliac region and hip. The distal circulation on the lower limbs was intact. The gait pattern was altered. The examination for a range of motion revealed restricted movements in bilateral hip joints [Table-1]. Patient was having the *Kapha-paittika prakriti* (constitution of the body), *Krurakostha* (bowel hard to purge), *Madhyamasara* (medium purity of body tissue), *Madhyamasatva* (Medium mental strength), *Madhyamasatmya* (homologation), and *Sama pramana* (equal body proportions). The patient had the *Madhyamavyayamashakti* (medium physical endurance), *Madhyamaaharashakti* (medium food intake), and *Madhyamajaranashakti* (Medium digestive power). *Asthi-majja-vaha-srotodusti* (pathology in bone and bone marrow) were prominent in this patient.

The patient was admitted to the indoor patient department of *Panchakarma* on 12/02/21 for seeking further improvement in hip function and pain. At the time of admission indoors, the patient had got relief in pain at the bilateral iliac region and hip joints during rest but felt pain during walking. A baseline Investigation was done on 13/02/21. Erythrocyte sedimentation rate (ESR), complete blood count (CBC), Rheumatoid arthritis factor, Urea, serum creatinine, Liver function test (LFT), Random blood sugar, Urine routine, and microscopic were within normal limits while low-density lipid cholesterol was 140 mg/dl (Reference interval-Borderline high-130-159 mg/dl) and Non-high-density lipid cholesterol was 165 mg/dl (Reference interval-Borderline high-160-189 mg/dl) which were slightly higher.

Table-1
Ranges of joint motion in bilateral hip joint for the case of Avascular necrosis-

Left hip joint					Right hip joint		
No.	Range of motion	Before treatment	After Panchakarma treatment	After 23 months of treatment	Before treatment	After Panchakarma treatment	After 23 months of treatment
1	Flexion	100°	110°	120°	90°	100°	110°
2	Extension	20°	25°	30°	20°	25°	25°
3	Adduction	20°	30°	30°	20°	25°	25°
4	Abduction	30°	35°	40°	20°	30°	40°
5	Internal rotation	40°	40°	40°	30°	35°	35°
6	External rotation	30°	35°	40°	5°	25°	35°

4. Timeline

The timeline of this case report is presented in tabular form [Table-2].

5. Diagnostic assessment and differential diagnosis

The patient was a known case of AVN. The diagnosis was made on the basis of an MRI report dated 18th July 2020 which showed AVN grade III-B in the left hip and IV-A in the right hip joint (according to Steinberg staging classification) [4]. History of excessive smoking and occasional consumption of alcohol was the risk factors [5,6].

The case was diagnosed as *Asthi-majjagatavata* according to Ayurveda. In this case, *Asthi* and *Majja* were mainly affected and the symptoms of *Asthi-majjagatavata* were also prominent in this case. The clinical features of *Asthi-majjagatavata* are *Bhedoasthiparvaṇam* (breaking type of pain/intense pain in bones), *Sandhishoola* (joint pain), *Satataruk* (continuous in nature), *Mamsabalaksaya* (muscles weakness and loss of strength) and *Asvapna* (disturbed sleep).] *Vatarakta* and *Sandhigatavata* were the differential diagnoses of the case. But absence of the vitiation of *Rakta* (blood tissue) and the absence of *Vata-purna-driti-sparshaha* (air-filled bag-like feeling) symptoms in this case rule out these diagnoses.

6. Treatment protocol

The line of management of *Vatavyadhi* was adopted. *Snehana* (internal and external oleation), *Swedana* (sudation), *Basti* (medicated enema therapy), *Nasya* (nasal therapy), *Abhyanga* (massage), *Utsadana* (specific massage with medicated paste), *Parisheka* (sprinkling of medicated liquid), etc. are the line of management for any *Vatavyadhi* [7]. Thus according to this line of management, *Shalishastika pinda swedana* which is the *Mridu* form of *Snehana* and *Swedana* and *Panchatikta-kshera basti* in the form of *Yapana basti* were administered. For the management of chronic *Vatavyadhi*, *Rasayana*, and *Yapanabasti* are indicated for the treatment. [3 verse 241] Hence the oral medications which are having *Rasayan* (-immune-modulation) effect and an effect on the vitiated *Vatadosha*, *Asthi* (bone), and *Majja* (bone marrow) were also used.

7. Treatment

Initially oral treatment was given for the first 8 months as *Panchakarma* facilities were not operational in the hospital due to the COVID-19 outbreak. Then one course of *Panchatikta-kshira-basti* (medicated enema enriched with milk) for 16 days and *Shalishastika pinda swedana* (a specific type of sudation with a poultice of rice bolus) for 24 days (till that patient felt exhausted) were given. Oral medications were continued during these procedures and also

Table-2
Timeline.

Date	Incidence/intervention
2016	Patient had a history of removal of brain cyst in 2016
22/06/20	Patient felt pain in bilateral hip joints with difficulty in walking for the last month. He visited the private hospital in Jaipur and was diagnosed as a case of avascular necrosis of the bilateral hip joints.
18/07/2020 21/07/22	MRI report showed AVN grade III-B in the left hip and IV-A in the right hip joint. Patient visited the hospital of the National Institute of Ayurveda Jaipur with the complaints of pain in bilateral hip joints and difficulty in walking for two to three months. The pain gradually started radiating to both the thighs for the last two months. The pain was dull and aching in nature and not relieved by rest. The patient also felt difficulty in cross-legged, sitting, and squatting. <i>Asthimajagata vata</i> was an Ayurveda diagnosis and he was advised for oral medication, for next eight months.
12/02/21	Patient was admitted in the inpatient door of <i>Panchakarma</i> department, National Institute of Ayurveda Jaipur. The patient was assessed for outcome measures. One course of <i>Panchatikta-kshira basti</i> (medicated enema enriched with milk) and <i>Shalishastika pinda swedana</i> (a specific type of sudation with a poultice of rice bolus) were given for 24 days along with oral medication. These oral medications were also continued till 10 January 2023. The patient was also advised to apply <i>Ashwagandha</i> oil on the affected part during this period.
08/03/21	Patient was assessed for outcome measures after 24 days of <i>Panchakarma</i> treatment which showed that range of motion was increased, weight was reduced from 90 Kg to 86 Kg and patient felt pain only during moderate walking.
18/06/22	MRI report dated 18/06/2022 showed changes in AVN grade which were changed to grade II from grade III in the left hip and grade III from grade IVA in the right hip joint. Range of motions was also increased.
10/01/23	Liver function test, renal function test, and lipid profile were within normal limits.

for the next 22 months when the patient was last assessed. He was also asked to further follow-up with these medications for longer duration. *Kaishora guggulu* in the dose of 750 mg twice a day with *Dashamula kwath* 40 ml twice a day, *Ashwagandha churna* (Powder of *Withania somnifera* Dunal) 3 g, *Guduchi churna* (Powder of *Tinospora cordifolia* L.) 1g, *Chopchini churna* (Powder of *Smilax china* L.) 2g and *Shilajitwadi loha* 500 mg with milk twice a day was given to the patient [Table3]. He was also advised to apply *Ashwagandha oil* on the affected part both external and internal oleation is indicated for *Vatavyadhi* and it also imparts strength to the tissues.

8. Outcome measures and follow-up

After 8 months of oral treatment the patient had got relief in pain at the bilateral iliac region and hip joints during rest but felt pain while walking.

Table 3
Panchakarma procedures and medicines given to a case of Avascular necrosis.

Panchakarma procedures	Method of preparation	Method of applications	Days of treatment
<i>Shalishaastika Pinda Svedana</i>	400 g of <i>Shashtikashali</i> (a specific variety of rice, which is yielded after 60 days) is cooked with 1.5 L of milk and decoction of <i>Bala Moola</i> (the root of <i>Sida Cordifolia</i> L.). This mixture is to be kept in four pieces of cloth to make 4 boluses. Another portion of milk and decoction of the same quantity should be mixed and heated at a low temperature to dip the above boluses for warming	Massage with <i>Ashvagandha Taila</i> was done whole body for 15 min followed by a whole-body massage for 45 min with the help of a cotton bag filled with a bolus of processed rice.	24 days
<i>Panchatikta Ksheera basti</i>	400 ml of Decoction of <i>Panchatikta kwath</i> was mixed with the same quantity of milk and heated again to reduce it to 400 ml quantity. 10g of Powdered rock salt was added to 50 g of honey and stirred. Then 75 ml <i>Ashvagandha Taila</i> and 50 ml <i>Mahatikta Ghrita</i> were added to this mixture and again stirred. Then paste of <i>Shatahwa</i> (<i>Anthum sowa Kurz</i>) followed by 400 ml of <i>Panchatikta</i> decoction processed with milk was added and mixed properly to make a homogenous emulsion, and heated gently in a water bath	Given before meal with <i>Basti Yantra</i> .	Total 16 <i>Basti</i> everyday

Name of the drug used orally	Composition Dose (twice a day)	Days of treatment
<i>Kaishora guggulu</i>	750 mg	30 months
<i>Dashamula kwath</i>	40	30 months
<i>Ashwagandha churna</i> (Powder of <i>Withania somnifera</i>)	3g	30 months
<i>Guduchi churna</i> (Powder of <i>Tinospora cardifolia</i> L.)	1g	30 months
<i>Chopchini churna</i> (Powder of <i>Smilax china</i> L.)	2g	30 months
<i>Shilajitwadi loha</i>	500 mg	30 months

9. Discussion

Disruption of blood supply or decreased blood flow to the femoral head is the main pathology in AVN. Ischemia can be resulted from internal (intravascular occlusion due to thrombi or embolic fat., direct cellular toxicity, or altered mesenchymal stem cell differentiation) or external vascular insult typically caused by direct trauma or intraosseous extravascular compression due to lipocyte hypertrophy or Gaucher cells [9]. However, the exact reason in this case was not clear. The vitiation of *Vata dosha* is due to *Dhatu kshaya* (depletion of these tissues) and *Margavarana* (obstruction in channels). Embolism indicates the vitiation of *Rakta dhatu* (blood tissue) similar to *Grathita raktapitta* (blood disorders related to coagulopathy). *Abhigata* (trauma) is also the root cause of *Vata* and *Rakta* (blood tissue) vitiation and it also leads to the pathology of AVN. In this case, the patient was *Sthula* (obese) with a BMI of 32.3 kg/m² and an occasional user of alcohol. The *Sthulyata* (~ metabolic syndrome manifestation) might be the causative factor behind *Dhatukshaya* (depletion of tissues) and *Margavarana janya vyadhi* (disease due to obstruction in normal physiology/deranged metabolism) with pathogenesis in the hip region. In this case, the non traumatic AVN might have developed with the associated use of alcohol in the presence of deranged metabolism. *Tiktadi ksheera basti* is indicated in *Asthipradoshaja vikaras* (diseases arising in bones). [7, chapter 28 verse 27] Hence *Panchatikta-ksheera-basti* was used. As *Ksheera-basti* is a *Yapana basti* (~enema for maintaining health), it can be used continuously without the use of *Anuvasana basti* and it can impart effects of both *Anuvasana* (oily enema) and *Niruha* (~evacuating enema) at the same time. This can be used for a longer duration until any complications like edema, fever, etc. are observed. Milk which was part of this *Basti* is considered as *Jeevaniya* (~life imparting) and can provide nutrition to the tissues. [7, chapter 25 verse 40] *Tikta rasa* has the *Upshoshana* (~absorbing/suction) property on *Meda* (adipose tissues/lipids), *Deepana* (stimulation of digestion), and *Pachana* (digestion) properties hence it is useful in overweight-related pathogenesis. [7, chapter 26 verse 43].

Parisheka (sprinkling) with *Dashmoola shruta ksheera* (milk processed with *Dashmoola*-ten roots having medicinal properties) is indicated for the treatment of pain due to *Vata* [3 chapter 29 verse 124] and a poultice of *Saksheera-mudaga-payasa* (petite yellow lentils pudding processed in milk and other *Vata dosha* pacifying medicines) is also useful for pain [3 chapter 29 verse 136]. Here petite yellow lentils are replaced with rice in *Shalishastika pinda swedana* and this poultice is dipped in *Dashmool shruta ksheera* before application on the body. The purpose of these procedures is to provide *Snehana* (oleation) and *Mridu swedana* (mild sudation) to control the vitiated *Vata dosha*.

Mahatikta ghrita is indicated in the treatment of *Maharoga* (grievous disorders) and is thus helpful in mitigating the pathology of any *Vatavyadhi* like this disease [10]. *Kaishora guggulu* is indicated in the *Vataja* disorders and can treat all diseases after continuous uses for long time. *Kaishora guggulu* can reverse the process of *Jara* (degeneration of tissues in old age) hence it may have an impact on AVN. [10 chapter 27 verse 104–113] *Dashmoola kwatha* is helpful to treat severe pain. [3 verse 124].

Ashwagandha (*Withania somnifera* Dunal) possesses *Rasayana* and *Brahmana* (anabolic) properties, so it is useful in all types of *Dhatukshya* [11]. It is also reported to have an anabolic effect on bone tissue [12]. *Guduchi* (*Tinospora cordifolia* (willd.) Hook.F. & thoms.) *churna* (powder) is indicated for *Vatarakta* and *Vataja* disorders (10, chapter 27 verse 10). It is also reported for the mineralization of bones [13]. *Ashwagandha* oil is indicated in *Vata vikara* (diseases due to *Vata dosha*), *Raktagata vata* (a disorder of *Vatadosha* in blood), *Mansavardhana* (increasing the muscles mass/

strength), and *Raktapitta* (blood disorders related with coagulopathy (10, chapter 26 verse 280). Embolism which may obstruct the vessels has a resemblance with *Grathita* (coagulated) *Raktapitta* hence *Ashwagandha* oil may have the action on AVN.

Chopchini (*Smilax china* L.) has the *Vedanahara* (pain relieving) property and is indicated for *Vatavyadhi* (a disorder of *Vatadosha*). Hence, it helps in decreasing the pain [11, *Haritkyadi varga* verse 108].

In obesity, *Medadhathu* (adipose tissues/fatty tissues) can obstruct the normal pathways of *Srotasas* (micro-channels) thereby hindering the proper distribution of nutrition to other tissues. This obstruction can ultimately result in the degeneration of these tissues. *Rasayana* may remove this obstruction, hence providing the proper nutrition to the tissues and promoting the regeneration of the tissues. The use of *Rasayana* is suggested for the treatment of any chronic *Vatavyadhi* [3, Chapter 28 verse 241] like AVN. *Shilajeet* (black bitumen) which is the main content of *Shilajatwadi loha* is indicated as *Rasayana*. *Shilajatwadi loha* is also administered in the case of *Kshaya* (~depletion of the tissues). [10, chapter 14 verse 86]. The uses of *Shilajatwadi loha* are also reported for *Siragatavata* (~vitiated *Vata dosha* affecting the blood vessels) which is among one of the *Vatavyadhi* [14]. *Shilajeet* is also reported to be effective in obesity. Hence *Rasayana* is useful in AVN by a reduction in weight which is ultimately helpful in the prevention of collapse in the AVN [15]. Oral *Shilajeet* supplementation in adult overweight human subjects can regulate the extracellular matrix-related genes that control muscle properties, elasticity, repair, and regeneration and thus promote skeletal muscle adaptation and regeneration of the tissues [16]. *Rasayana* drugs are indicated to be used for a longer duration in AVN-like conditions hence these were used for 30 months long treatment. A published study shows that there is a progression in radiological grading in AVN which ultimately leads to the collapse of the femoral head and thus requires surgical intervention [17]. Generally conservative treatments after 24–48 months of follow-up are best implemented and effective before the onset of subchondral fracture [18–20]. In this case, Ayurvedic management demonstrated effectiveness, even in the presence of subchondral collapse. Radiological evidence showed regression within 23 months of follow-up, suggesting its effectiveness in halting disease progression. *Rasayana* played a vital role in tissue regeneration, offering promise for AVN treatment. Thus the management of *Asthi-majjagatavata* may be beneficial in breaking the pathology and treatment of AVN. It can be concluded that *Panchakarma* procedures and *Rasayana* may be useful for the treatment of AVN of hip joint. Further studies are needed to establish the findings.

10. Patient consent

Written permission for publication of this case study has been obtained from the patient.

11. Patient's perspective

The patient was satisfied with the given treatment.

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