

**MANAGEMENT OF AVASCULAR NECROSIS OF THE HIP – A CASE STUDY****Kishor R**

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**ABSTRACT**

Avascular necrosis (AVN) is defined as the cellular death of bone components due to interruption of the blood supply. Due to the cell death, there will be the collapse of the bone structure which causes pain, loss of joint function, and long-term joint damage. AVN is most commonly encountered in the hip. The avascular necrosis of the femoral head may be due to primary or idiopathic, or secondary causative factors like alcohol abuse, gout, renal osteodystrophy, sickle cell anemia, and systemic steroid use. In all types of the histologic picture of avascular necrosis of the femoral head is the presence of empty lacunae in the trabecular bone. Because of limited collateral circulation, disruption of the blood supply to the head of the femur can lead to ischemia and subsequent necrosis. If restoration of blood supply does not occur promptly, this will lead to the progressive death of osteocytes followed by the collapse of the articular surface, and eventually by degenerative arthritis. Avascular necrosis of the hip may be considered *Asthimaja gata vikara*. *Bhagna chikitsa* may also be incorporated here.

Keywords: *Avascular necrosis, Asthimajja gata vikara, Bhagna chikitsa***INTRODUCTION**

Avascular necrosis (AVN) of the hip, is the death of the femoral head as a result of vascular disruption. AVN of the hip results in pain around the hip which is insidious in onset. It is also defined as the cellular

death of bone components due to interruption of the blood supply. Due to the cell death, there will be the collapse of the bone structure which causes pain, loss of joint function, and long-term joint damage. AVN

is also known as osteonecrosis, aseptic necrosis, and ischemic bone necrosis.¹ AVN of the femoral head is diagnosed at a rate of 10,000 to 20,000 new cases per year in the United States. The typical age ranges from 35 to 50 years old with the average age of presentation being 36 years old. The prevalence is higher in men than women. There is also a high prevalence of bilateral disease. AVN is most commonly encountered in the hip. The avascular necrosis of the femoral head may be due to primary or idiopathic, or secondary causative factors like alcohol abuse, gout, renal osteodystrophy, sickle cell anemia, and systemic steroid use. In all types of the histologic picture of avascular necrosis of the femoral head is the presence of empty lacunae in the trabecular bone. It is a type of osteonecrosis due to the disruption of blood supply to the proximal femur.² AVN of the femoral head associated with trauma results from damage to the medial femoral circumflex artery which is the main blood supply to the femoral head³. This leads to the death of cells within the bony matrix. The reparative process begins which weakens the subchondral bone, leading to bony collapse and eventually arthritic changes of the joint⁴. Patients with AVN of the femoral head will present with symptoms of hip pain with insidious onset. Typically, the pain will be associated with standing from a seated position, stairs, inclines, and impact loading. The pain will tend to be more noticeable in the anterior hip or groin as opposed to the buttock or greater trochanter.

Proper evaluation of a patient with suspected AVN of the femoral head is similar to the patient that presents with hip pain. The physical exam includes inspection of the hip, including the skin, the position of the lower extremity, and gait evaluation as well as palpation of the surrounding bony structures such as the greater trochanter. The range of motion testing includes flexion, extension, abduction, adduction, and internal and external rotation. A thorough neurovascular exam is needed to evaluate for sensory and motor function. There are helpful special hip tests including the log roll and the Stinchfield test to help determine intra-articular pathology. Standard imaging includes radiographs of the pelvis and hip, including an anteropos-

terior view of the pelvis, an anteroposterior, and a frog-leg lateral view of the affected hip. In a case of high suspicion, an MRI of the hip is indicated.

Treatment of AVN of the femoral head is dependent on symptomatology as well as radiographic findings such as evidence of the collapse of the femoral head, size of the necrotic lesion in the femoral head, and involvement of the acetabulum. The possible treatment in modern include NSAIDs, core decompression, Bone transplant (grafting), and total joint replacement surgery which have their own complications and adverse effects.

In Ayurveda, there is no direct reference to AVN; the treatment modality of avascular necrosis is done according to *Dosha* and *Dushya*⁵. In this condition the predominant *Dosha* is *Vata*, and *Dushya* is *Asthi*, in the chronic stage there is *Tridosha* involvement. On the basis of clinical presentation, AVN can be correlated with *Asthi Majja Gata Vata*⁶. The clinical features of *Asthi Majja Gata Vata* are *Bhedoasthiparvanam* (breaking type of pain in bones), *Sandhishoola* (joint pain), *Satata ruk* (continuous in nature), *Mamsabalaksaya* (loss of strength and muscles weakness), and *Asvapna* (disturbed sleep), which can be correlated with symptoms of AVN. Here, an attempt is made to understand the AVN of the femoral head as *Asthimajja gata vikara*, and its management is discussed in a case report.

Case report

Presenting complaints

A 27-year-old male complaining of pain in the left hip while walking for the past four months. He also complained of a slight decrease in sensation in his left calf muscles for four months.

H/o presenting complaints

The patient met with an accident about ten months back and suffered from a fracture of the left foot and was on POP for one month. He also had a fracture of the nasal bone, sphenoid, infra-orbital bone, zygomatic bone, and ethmoid bone. He was on bed rest for one month. He also took steroid medications for one and half months as part of the treatment for the above said. Five months after this incident he felt an aching

pain in his left hip while walking and climbing stairs. The pain gradually increased, he consulted an orthopedician and was advised to take MRI. He was then diagnosed with AVN's left hip. The patient was advised to do decompression surgery. He then came to the hospital for further management.

The patient has a history of Hypertension for which he took allopathic medicine for six consecutive years. He has stopped the medicines for the past two months as per the advice of the doctor. He also suffered from occasional GERD. His bowel and bladder were normal. He weighed 69 kg with a height of 168cm.

On examination

The patient suffers from no other systemic illness.

Inspection

- Gait – antalgic with slight limping left leg, he walks on elbow crutches to avoid the weight bearing on his left hip.

The initiation of walking was painful.

- The attitude of the limb – standing and supine: normal
- No muscle wasting

Palpation

- Muscle tone – hypo tonicity of left quadriceps and gastrocnemius
- Tenderness – grade I – left femoral head.

Tests

- No limb length discrepancy
- No fixed flexion deformity
- No fixed abduction/ adduction deformity

Movements

- Hip flexion is painful at 105 degrees
- Hip Extension - complete but painful (VAS SCALE – 5)
- Active SLR against resistance (supine) – grade I pain at 45 degrees
- Hip abduction – possible (45 degrees)
- Hip adduction – possible but painful at 45 degrees
- External rotation – at 90degree flexion – painful, at full extension – slightly painful
- Internal rotation – at 90-degree flexion – painful, at full extension – slightly painful

Investigations

Blood investigations which included FBS, LIPID PROFILE, LFT, KFT, URIC ACID, BLOOD R/E, URINE R/E, CRP, and ASO were normal.

X-ray

Pelvis – AP –left hip- space reduction b/w acetabulum and femoral head

MRI Pelvis

Avascular necrosis left hip (modified Ficat and Arlet –stage II)

Treatment protocol

Days	Treatment done	Condition of patient
Day 1 to 3	Mild <i>Udwartana</i> + <i>Takra pana</i>	<ul style="list-style-type: none"> • Flexion -45-degree limitation • Extension –active – 30-degree limitation, passive – complete • Tenderness-G1-lateral compartment
Day 4 to 10	<i>Sneha pana – Guggulu tiktakam ghrtam</i>	<ul style="list-style-type: none"> • Flexion -40-degree limitation • Extension -30-degree limitation • Tenderness-G1-lateral compartment
Day 11 to 13	<i>Abyanga using Dhanwantharam thailam</i> <i>Ushma sweda</i>	<ul style="list-style-type: none"> • Flexion -40-degree limitation • Extension-20-degree limitation • Power-extensors of the knee- 3/5 • Power-flexors of the knee- 4/5
Day 14	<i>Virechana</i> - <i>Nimbarmtha erandam</i>	<ul style="list-style-type: none"> • Flexion -40-degree limitation • Extension-30-degree limitation • Power-extensors of the knee- 3/5

		<ul style="list-style-type: none"> Power-flexors of the knee- 4/5
Day 15	Rest	
Day 16 to day 22	<i>Pizhichil - Dhanwantharam thailam</i>	<ul style="list-style-type: none"> Flexion -30-degree limitation Extension-10-degree limitation Power-extensors of the knee- 3/5 Power-flexors of the knee- 4/5
Day 20 to day 22	<i>Matravaasthi – Dhanwantharam mezhukupakam</i>	<ul style="list-style-type: none"> Flexion -30-degree limitation Extension-active and passive -complete Power-extensors of the knee- 3/5 Power-flexors of the knee- 4/5
Day 26 to day 30	<i>Ksheera vasti Panchatiktaka ksheera vasti (Guggulu tiktaka ghrtam + Dhanwantharam mezhukupakam)</i>	<ul style="list-style-type: none"> Flexion -25-degree limitation Extension - complete Power-extensors of knee- 4/5 Power-flexors of knee- 4/5

Internal medicines

Gandharva hasthādi kasayam – 90 ml bid

Mahamanjishthadi kasayam – 90 ml bid

Dhanwantharam gulika – 1 bid after food

Gandha thailam – 10 drops bid

Abhyarishta – 25 ml bid

DISCUSSION

Avascular necrosis of the hip may be correlated with *Asthimajja dhātu kṣaya vikaram* and also as a *Bhagna* to the hip region. Bearing this in mind in the initial period only minimal weight bearing and movements should be advised to the patient. *Asthi dhātu* when undergone *kṣaya* produces *Athi toda* (pain in the bone)⁷. Pain in the hip joint is one of the clinical features of avascular necrosis hip. *Kṣaya* of *Majja dhātu* produces *Sauśīrya* in *Asthi* (osteonecrosis)⁸. The pathophysiology of AVN HIP shows the presence of empty lacunae in the trabecular bone featuring osteonecrosis. In the present case, the patient may have developed AVN by use of steroids as he had a history of continuous steroid intake for 3 months. Due to the intake of steroids, the blood supply to the femoral head² gets hampered causing a *Raktavaha srotorodha* resulting in *Asthi* and *Majja dhātu kṣaya*. Considering this, initially, a *Shodhana* procedure was planned. Before *Snehapāna* and *Sodhana*, a mild *Udwartana* and *Takrapāna* were done. *Udwartana* is *vatakaphahara*⁹. It may aid in the removal of *Srotorodha* and also increase muscle tone. *Takrapanam* does *Ag-*

nideepana. *Snehapanam* was done using *Guggulu tiktakam ghrtam* as it acts on *Sandhi asthi majja gata vikara*¹⁰. After *Samyak snigdha lakshana*, *virechana* was done using *Nimbaamrutha eranda taila*. *Virechana* was done here considering the concept of *Garavisha* also as the case here is a steroid-induced AVN¹¹.

After *Virechana*, *Pizhichil* was done (*Taila dhara*) so that no pressure was applied in and around the joint and also to prevent excessive movements of the hip joints and legs. During the period of *Pizhichil*, there was a considerable increase in the active flexion and extension of the hip with an increase in muscle power also. During the last two days of *Pizhichil*, *Anuvasana vasthi* was also administered. *Anuvasana vasthi* is indicated in *Bhagna* of *saka*¹². Then consider the overall health of the patient, *Panchatiktaka ksheer vasthi* was administered to the patient. *Tiktaka rasa* does *Asthi dhātu pushti*. But it is *Vata vardhaka* so the patient may experience an increase in symptoms. Therefore, in order to compensate for this *Acarya vagbhata* advises the administration of *Tikta rasa samskrita snigdha drava* so that *Ashti dhātu* will get nourished along with the alleviation of *Vata*. Thus,

Panchatiktaka ksheera vasthi was found to produce a good effect in increasing the strength and tone of the hip extensors and flexors and also improved hip movements. It may have also helped to replenish the *Asthi dhātu* and thus preventing the further deterioration of the femoral head. *Ksheera* is *madhura rasa* and is *Bhagna sandhana kara*. Along with these therapies, exercises that improve the endurance and tonicity of the hip flexors and extensors were also advised in a phasic manner.

Follow-up was taken regularly and MRI was advised to take as per the request of the patient. MRI was taken 8 months after the treatment as per the request of the patient. It read "as compared to previous scan findings are similar, there is no increase in the stage of avascular necrosis seen."

CONCLUSION

Avascular necrosis of the hip may be considered *Yapya vyadhi*. Proper and regular intake of medicines with *Pathya ahāra* and *Vihara* is essential to keep this disease at bay. Whenever the disease exceeds the limit of conservative management, surgical management can be adopted in this disease. Therefore, as per the advice of *Acharya Susruta*, a period of watchful waiting may be considered in AVN hip with careful and regular follow-ups.

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