International Journal of Health Sciences and Research
Vol.10; Issue: 11; November 2020
Website: www.ijhsr.org
Case Report *ISSN: 2249-9571*

Avascular Necrosis of Femoral Head - Ayurveda Management: A Case Study

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ABSTRACT

Avascular necrosis (AVN) is the death of bone tissue due to a loss of blood supply, therefore also called as osteonecrosis, ischemic bone necrosis. Treatment includes physiotherapy, surgery and medication as NSAIDs. All the treatment procedures are cost worthy and prognosis is poor. Present case was aimed to evaluate the efficacy of Ayurvedic procedures in the conservative management of AVN of the femoral head. In this present case a 45yr old male was diagnosed with AVN of bilateral hip joint associated with Osteoarthritis of hip, was managed with *Udvartana* followed by *Shodhana* and *Brimhana* and treated as described in *Ayurveda*. Patient was observed for symptomatic improvements based on signs and symptoms before and after treatment.
Observation/ Results: The results were encouraging. The therapy provided marked improvements in the gait, pain, tenderness. Conservative management of AVN through Ayurvedic principles provides significant relief in sign and symptoms and improves quality of life.

Key-words: Avascular necrosis (AVN), Asthi-Majjagata Vata, Manjisthadi Ksheera Basti, Udvartana , Patra Pinda Swedana.

Key Messages: Avascular necrosis management needs medication which control pain with some surgical intervention is the main focus now in days. With *Panchakarma* procedures it will also makes an impact to relive the main symptoms without any side effects which is also cost effective.

INTRODUCTION

Avascular necrosis (AVN), is osteonecrosis (dead bone) and is additionally called Osteonecrosis/Aseptic necrosis/Ischemic bone disease. [1] Avascular necrosis (AVN) of the femoral head is a dreaded complication of corticosteroid therapy. It can be seen in 3-40% of patients receiving corticosteroid therapy. This condition is one of the most testing issues looked by orthopaedic specialists. The destinations of the treatment incorporate the protection of structure, capacity and help from pain. [2] Numerous surgeries, for example, boring, inclusion of bone unions, changed Whitman or Colonna recreation and addition of prosthesis are completed to cure this condition. [3] AVN is caused due to the injury or any occlusion in the blood vessels which provides circulation to the bone tissue. [4] AVN of femur head is that the most typical type of necrosis of the bones. It generally affects people between age of 30 to 50 years.

AVN of femoral head is also classified mainly into 2 types: 1) Post traumatic 2) Idiopathic. The arteries which supply the femoral head area are very tiny and thus area is simply susceptible to injury followed by mere dislocation or a sub capital fracture (near the head) of femur. [5] This ends up in the necrosis of femoral

head. In the other, the arteries become occluded the reason behind it is not identified. It may be asymptomatic within the starting however later delicate to severe degree of pain is seen in conjunction with change within the gait. AVN of femoral head presents with groin pain that radiates down towards anteromedial thigh. Change within range of motion i.e. abduction, adduction, flexion and extension are found.

Similarly in Ayurveda, one of the presentations of AVN could be considered as *Asthi-majjagata vata* due to similar signs and symptoms. Wide range of treatment modalities have been mentioned in Ayurveda that are effective in such manifestations.

Table 1: Signs and Symptoms of *Asthi-Majjagata Vata* [6]

Srno.	*Signs and Symptoms*
1	*Bhedoasthiparvanam (breaking type of pain in bones)*
2	*Sandhishoola (joint pain)*
3	*Mamnsakshaya (muscular wasting)*
4	*Balakshaya (weakness)*
5	*Sandhi Shaithilayam (laxity of joints)*
6	*Aswapanasantatruka (sleeplessness due to continous pain)*
7	*Shiryantiva cha Asthinidurbalani (destruction of bony tissue causing generalized weakness)*

CASE HISTORY

This is a case report of 46 years old male, non-diabetic and non-hypertensive patient presented with pain in bilateral hip joint along with reduced movement of both legs since 2years. The pain was continuous in nature and radiating to bilateral thighs. Relieving factors includes rest, warm poultice. Transient relief was seen after conventional medication with recurrence and intensified pain and inability to walk without support. His condition gradually worsened and he was advised for surgical intervention, which the patient refused due to cost affair and approached *Ayurvedic* treatment for the same.

Past history:

The patient was apparently healthy before 2year, then he suffered with high grade fever which was managed after taking some medication from nearby physician. After that he developed pain in his right hip and lower back which made him difficulty in walking and pain was in midnight. He diagnosed by several physician as post pyrexia polyneuropathy before but later he noticed that his both legs were different in length then undergone MRI and X-ray of hip joint and diagnosed as AVN of bilateral hip joint by an orthopaedic surgeon and had recommended surgical intervention.

Personal history:

Personal history revealed mixed diet, reduced appetite, irregular bowel habit and sleep disturbance due to pain. He is a chronic smoker since 20 years and occupationally was being a chef in a canteen and had long hours of standing duty since last 25years.

Medical history-

No such history of taking any steroid or bicarbonates which are being a probable cause for AVN. He was undergone treatment for only fever and took some antipyretic medicines before 2 years.

Local Examination:

Tenderness was present at hip region. There was significant loss in range of movements. He had limping gait due to shortening of the right leg by 1cm. Measurements of lower limb: -

1.Apparent length
A.Right leg-85cm
B.Left leg-86cm
2.True length
A.Right leg-90cm
B.Left leg-91cm
3. Inter Malleolar length- 41.5cm

Examination of patient:

Both general and systemic examination was done as per Ayurveda and contemporary methods-

Table no.-2: *Aaturabala pramana pariksha* (examination of the strength of the patient)

1	*Prakriti* (body constitution)	*Kaphapradhan pitta*
2	*Sara* (quality of tissue)	*Madhyama* (average): *meda*, *mamsa*
3	*Samhanana* (body built)	*Madhyama* (average)
4	*Pramana* (anthropometry)	Wt. 70kg, Ht. 5'6''
5	*Satmya* (adatibility)	*Madhyama* (average)
6	*Satva* (mental strength)	*Madhyama* (average)
7	*Aaharashakti* (food intake and digestion capacity)	*Abhyabaharana* – average *Jarana* – 6-7hr
8	*Vyayamashakti* (exercise capacity)	*Avara* -poor
9	*Vaya* (age)	*Yuvavastha* (adult)
10	*Desha* (habitate)	*Sadharana*

Table no-3: *Asthavidha pariksha* (Eight-Fold Examination)

1	*Nadi* (pulse)	76b/min, regular
2	*Mutra* (urine)	*Samyaka*
3	*Mala* (stool)	Hard with irregularity
4	*Jihva* (tongue)	*Samyaka*
5	*Shabda* (sound)	*Samyaka*
6	*Sparsha* (touch)	*Samyaka*
7	*Drik* (eye)	*Spastha*
8	*Aakriti* (built)	*Sthoola*

On physical examination, range of motion of the right hip was severely limited and painful in all ranges, with difference in length of both lower limbs i.e. right limb was found smaller than left lower limb so patient is bent down on right side while standing or during walking. Mostly pain is being felt in abduction and extension. Mild tenderness was observed during palpation of muscles. There was no muscle atrophy. Lumbar spine range of motion was reduced due to pain in right lateral flexion and right rotation. Straight leg raise produced right hip pain with stretch in thigh. Posterior joint provocation test was painful for testing L4, L5 and S1. Muscle palpation reveal tenderness in right gluteal muscles. Range of motion of the both knee joint was full and painless. Lower limb neurological testing revealed normal reflexes and sensory testing bilaterally.

Investigations:

1. X-ray (both hip joint)
   - Rt. Hip space reduces with multiple osteophytes.
   - Rt. Femoral head is mildly deformed with sclerotic changes.
2. MRI
   - Disc bulge at L4, L5, indenting the anterior thecal sac.
   - AVN with grade 2 Osteoarthritis in right leg
   - Grade 2 AVN in left leg.

Table no-4: Details of Investigations:

SrNo.	Investigation	Result
1	Anti CCP	Negative
2	HLaB27	Negative
3	Blood Sugar Random	120mg/dl
4	C.R. P	1.97 (Positive)
5	Lipid Profile Total cholesterol HDL LDL Non-HDL Cholesterol	 294mg/dl 37mg/dl 235mg/dl 257mg/dl

Assessment Criteria:

Range of movement of hip joint i.e. Abduction, Adduction, Extension, Flexion, Internal rotation, External rotation was measured by Goniometer.

Visual Analogue Scale (VAS) is used for pain & Oxford Hip Score.

VAS Pain Score –In VAS Score "0" denoting No Pain and "10" denoting Worst Pain.

Treatment administered

Oral *Ayurveda* medicines were administered in the patient. The details are mentioned below:

Table no-5: Details of oral medications administered:

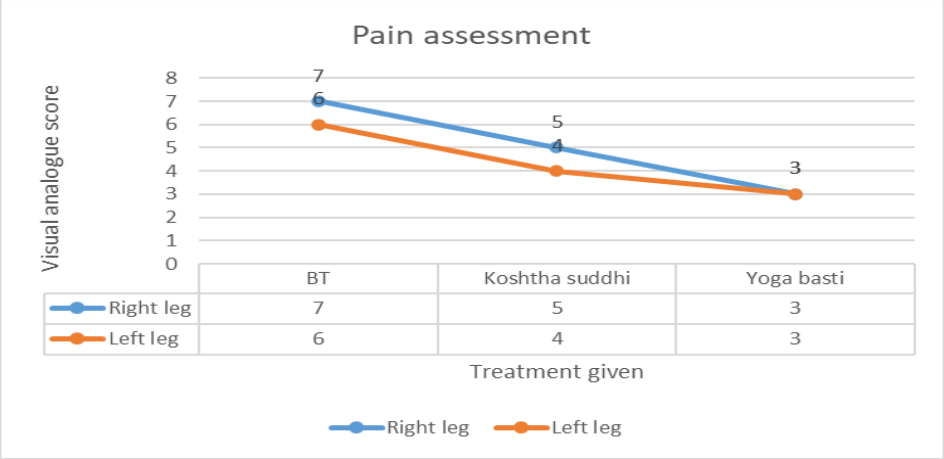
Sr no.	Drug	Dose	*Anupana*	Time	Duration
1	*Dashamoola kwatha*	10 ml	Luke warm water	After food TDS	3weeks
2	*Kaishore guggulu*	500mg	Luke warm water	After food BD	3weeks
3	*Avipattikar choorna*	5mg	Luke warm water	Empty stomach early morning OD	3weeks

Table no 6: Details of therapies administered:

Sl no.	Procedure	Ingredients	Duration
1	*Udvartana*	*Triphala churna*	6days
2	*Vashpa Swedana*	*Dashamoola kwatha*	6days
3	*Kostha Shuddhi*	*Eranda taila*	1day
4	*Patra pinda sweda*		7days
5	*Yoga Basti*	*Anuvasana – Guggulu tiktak ghrita + Sahacharadi taila+ Shatapushpa+Saindhava* *Niruha basti :* *Honey- 60ml* *Saindhav- 5gm* *Guggulutiktak ghrita-75ml* *Satapushpa kalka-30gm* *Manjisthadi ksheera paka-240 ml*	8days

OBSERVATIONS

Pain was assessed using Visual Analogue Scale (VAS) Score from 0 to 10. Visual Analogue Scale (VAS) was 7 in right leg before treatment and it came down to 5 during the treatment and after treatment it reduced to 3. In left leg it was 6 before treatment and it came down to 4 during treatment, after treatment it reduced to 3.



Assessments of flexion, extension, adduction, abduction, internal rotation and external rotation were made before and after completion of treatment. (*Udvartana*, *Bashpa Swedana*, *Kostha Shuddhi*, *Patra Pinda Swedana*, and *Yoga Basti*.) Improvements in Range of Movement of hip joint are shown in table 7. Oxford Hip Score was done before treatment and after the completion of treatment. Significant improvement found in Oxford Hip Score which is shown in table no 8.

Table no-7: Observation in range of movement of hip joint:

Range of movement		Before Treatment (In degree)	After Treatment (In degree)
Abduction	Right Leg Left Leg	12 10	20 16
Adduction	Right leg Left Leg	20 29	24 29
Flexion	Right Leg Left Leg	66 110	82 125
Extension	Right Leg Left Leg	36 10	37 25
Internal Rotation	Right Leg Left Leg	33 35	34 32
External Rotation	Right Leg Left Leg	25 37	32 36

Table no-8: Showing Improvement in Oxford Hip score [7]

Before treatment	After treatment
17	36

Grading for the Oxford Hip Score

Score 0 to 19	May indicate severe hip arthritis. It is highly likely that you may well require some form of surgical intervention, contact your family physician for a consult with an Orthopaedic Surgeon.
Score 20 to 29	May indicate moderate to severe hip arthritis. See your family physician for an assessment and x-ray. Consider a consult with an Orthopaedic Surgeon.
Score 30 to 39	May indicate mild to moderate hip arthritis. Consider seeing you family physician for an assessment and possible x-ray. You may benefit from non-surgical treatment, such as exercise, weight loss, and /or anti-inflammatory medication
Score 40 to 48	May indicate satisfactory joint function. May not require any formal treatment.

DISCUSSION

Avascular necrosis (AVN) is a death of bone tissue because of interference of the blood supply. Early on there might be no symptoms. Complexity may incorporate combination of the bone or nearby joint surface. Aetiology may be traumatic or nontraumatic where in nontraumatic caused by occlusion of blood due to intra vesicular or outer compression of blood vessel to reduce blood flow on the femoral head leads to AVN. Obstruction of blood might be due to fat embolism because of increased lipid profile or aggregation of dead red blood cells in sickle celled cases which are mostly found. Therefore, treatment modalities depend on mostly blood thinner or lipid lowering agents.

In this present case there was no history of trauma or other factors which reduces bone composition. There were disturbances found in lipid profile. He had increased cholesterol level and history of smoking with BMI was indicative of mild obesity. Therefore, treatment started with *Udvartana* (Dry Herbal Powder Massage) and *Vashpa Swedana* (Steam Bath). It helps to remove *Srotorodha* (obstructions) and brings about *Sthirī karaṇa* of *Aṅgas* (imparting compactness to body). [8] *Rukshana* would be the procedure of choice to remove *Avarana* brought about by *Kapha* and *Meda* and to increase bioavailability of subsequent treatments. *Udvartan* helps in reducing BMI, WHR and serum lipid values. [9] Then after *Rukhshana* for cleansing of *Dosha* from *Koshtha, Koshtha Shuddhi* was done. In *Vatadosha Upakrama Mrudu Shodhana* is advised [10] so it is administered in the form of *Kostha Shuddhi* by focusing the condition Asthimajjagata *Vata* also *Vata Dosha* is the main cause in forming *Samprapti,* also it is helpful before administrating *Brimhana Yoga.*

Vata and Kapha this two are root cause of Asthimajjagata Vata. Patra Pinda Sweda is described as Sandhichestakara, Srotosuddhikara, and Kapha-Vatanirodhana by considering this property it was planned accordingly. [11] Also, the main complaint was pain which is observed in many cases of *Asthimajjagata Vata. Patra Pinda Swedana* was planned on behalf of reducing pain, stiffness and swelling. It pacifies *Vata and Kapha* in the influenced joints, muscles and surrounding area causes perspiration and analgesic effect. *Patra* used for the *Patra Pinda Swedana* is referenced in the *Swedopaga Gana* of *Acharya Charaka*. The medications utilized are having *Vatahara* property by virtue of *Ushna Virya, Snigdha and Sukshma Guna.*

Yoga Basti: *Vata* acts as prime *Dosha* among *Tridosha* as well as plays important role in samprapti. Basti is described as best for *Vatashamana,* hence *Basti* was planned accordingly. *Sahacharadi oil* and *Guggulu Tiktaka Ghrita* was utilized in *Anuvasana Basti*. *Asthi Dhatu* is affected in AVN.*Gugglu Tiktaka Ghrita* was utilized in light of the fact that *Tikta Siddha Basti* is indicated in *Asthi Aashrita Vikara* . Drugs of *Sahacharadi oil* are *Snigdha, Guru,* and *Ushna Virya* which conciliate *Vata Dosha.*

AVN of hip joint is caused due to blockage of little blood vessels providing circulation to femoral head. Along these lines, *Raktavaha Srotorodha* becomes prime reason prompting *Asthi Dhatu Kshaya* in the hip joint. To counter this *Rakta Dushti,Manjishthadi Ksheera Basti* was administered. *Manjishthadi Kwatha* is *Raktaprasadaka* and *Tridoshahara. Kṣheera Basti* is a sort of *Niruha Basti* containing *ksheera* as the *Drava Dravya* (liquid). *Madhura and snigdha* are the properties of *kṣheera* which help to control *Vata Doṣha* and causes *Bṛihmaṇa* of *Rasadi Dhatu.*

CONCLUSION

There is no permanent treatment for AVN. Joint substitution is the treatment at last, which has its own impediments. This case shows positive outcome in terms of improvement in range of motion which helps to forestall the further deterioration and improve the capacity of the influenced part of bone. The treatment given to the patient could be non-invasive procedures and cost effective. In spite of the fact that it didn't fix the illnesses totally as anatomical changes can't be turned around, yet it helps in preventing the further complications. Patient can have typical day by day routine easily after the finishing of treatment with present results was encouraging. Further examination on large sample size is required to build up the Ayurveda treatment protocol for avascular necrosis of Head of Femur and progress of the disease.

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How to cite this article: Kabra D, Jena S, Bhatted SK et.al. Avascular necrosis of femoral head - ayurveda management: a case study. Int J Health Sci Res. 2020; 10(11):22-27.

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