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### RESEARCH ARTICLE

#### AYURVEDIC INSIGHTS OF AVASCULAR NECROSIS OF FEMORAL HEAD

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#### Abstract

Avascular necrosis of the femur head (AVNFH) is a debilitating disease caused due to the use of alcohol, steroids, following trauma or unclear (idiopathic) etiology, affecting mostly the middle aged population. Clinically AVNFH is associated with impaired blood supply to the femoral head resulting in bone necrosis and collapse. In Ayurveda, there is no direct reference of disease resembling to Avascular necrosis of femoral head, hence it can be understood on the basis of *Vikaraprakriti* of disease caused by vitiation of *Dosa*, *Adhithana* (abodesite) and *Hetu* (causes of vitiation of *Dosa*). In the present study an effort has been made to understand AVN on the ground of Ayurveda.

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#### Introduction:-

Avascular necrosis of femoral head (AVNFH) is a progressive, multifactorial and challenging clinical problem that is on the rise mostly affecting the middle aged male population in the most productive age group of 25–50 years. Clinically, AVNFH is a pathological state with multiple etiologies associated with a reduction in the vascular supply to the subchondral bone of the femoral head. This results in osteocyte death and progressive collapse of the articular surface followed by degenerative arthritis of the hip joint.<sup>1</sup> It is of two types- traumatic and non traumatic.

#### Causes

##### Dislocation or fracture of the thigh bone (femur).

This type of injury can affect the blood supply to the bone, leading to trauma-related avascular necrosis. AVN may develop in 20% or more of people who dislocate a hip.

##### Chronic corticosteroid use.

Long-term use of these inflammation fighting drugs, either orally or intravenously, is associated with 35% of all cases of non traumatic AVN. Although the reason for this is not completely understood, doctors suspect these drugs may interfere with the body's ability to break down fatty substances. These substances collect in the blood vessels -- making them narrower -- and reduce the amount of blood to the bone.

##### Excessive alcohol use.

Much like corticosteroids, excessive alcohol may cause fatty substances to build in the blood vessels and decrease the blood supply to the bones.

Blood clots, inflammation, and damage to the arteries. All of these can block blood flow to the bones.

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Other conditions associated with non traumatic AVN include:

1. Gaucher disease, an inherited metabolic disorder in which harmful quantities of a fatty substance accumulate in the organs
2. Sickle cell disease
3. Pancreatitis, inflammation of the [pancreas](#)
4. HIV infection
5. Radiation therapy or chemotherapy
- 6..Autoimmune diseases
7. Decompression sickness, a condition that occurs when the body is subjected to a sudden reduction in surrounding pressure, causing the formation of gas bubbles in the blood.

### Symptoms of Avascular Necrosis

In its early stages, AVN typically cause no symptoms; however, as the disease progresses it becomes painful. At first, you may experience pain when you put pressure on the affected bone. Then, pain may become more constant. If the disease progresses and the bone and surrounding joint collapse, you may experience severe pain that interferes with your ability to use your joint. The time between the first symptoms and collapse of the bone may range from several months to more than a year.<sup>2</sup>

### Pathogenesis

The pathogenesis of osteonecrosis is an area of controversy. Most experts believe that it is the result of the combined effects of genetic predisposition, metabolic factors and local factors, affecting blood supply, such as vascular damage, increased inter osseous pressure, and mechanical stresses. The mechanism responsible for the osseous infarction is fat embolism and intravascular fat globules are often found in resected femoral heads in idiopathic necrosis. It probably begins by an interruption of the blood circulation within the bone, subsequently the adjacent area becomes hyperaemic, resulting in de-mineralization in trabecular thinning and later incollapse.<sup>3</sup>

### Treatment

Treatment has been facilitated by using a widely accepted international classification system, effective earlier diagnosis using MRI and more aggressive surgical management. No universally satisfactory therapy has been developed, even for early disease. It is essential that AVN of the femoral head is diagnosed early because delaying this disease by joint preserving measures have a much better prognosis and because the results of joint replacement are poorer in young individuals.<sup>4</sup>

### Ayurvedic View

There is no direct reference available in our literature which corresponds to AVN of femoral head. But with the help of *Hetu, Dosha* and *Dhatu* involvement we can make *Samprapti* of the disease. *Hetu* plays a significant role in the pathogenesis of any disease. Various factors liable for vitiation of *Vata* and *Pitta*, along with the factors guilty for vitiation of *Asthivaha* and *Majjavaha Srotas* are responsible for pathogenesis of AVN. *Astangahridaya* describes the factors responsible for provocation of *Vata* and *Pitta*.<sup>5</sup> Due to vitiation of *Vata Dosha* there is *Dushti* of *Vyanavayu* which is responsible for normal circulation of blood through vessels results in improper flow of blood through bone tissues which causes *Toda, Ruka, Sausirya, Vataprakopaka Laksanas*. *Pitta Dosha Dushti* is responsible for *Rakta Dushti* due to *Ashrayaashrayibhava*<sup>6</sup> and its *Updhatu Sira* which causes impaired vascular supply resulting in *Kotha* (osteonecrosis) of *Asthidhatu*.

Similarly, dietary factors such as intake of *Abhisyandi* and incompetent foods (*Virudhaahara*) that are responsible for *Majjavahasrotodusti*<sup>7</sup>, indirectly provokes *Vata* due to *Srotoavrodha* produced by *Ama* formation resulting in impaired work of *Vyanavayu*. Indulgence in unwholesome dietary and lifestyle factors cause vitiation of *Asthivahasrotas*; for e.g., overexercise, concussion and violent flexion directly leads to provocation of *Vata*, resulting in *Asthiksaya*.<sup>8</sup> which produce symptoms like *Asthitoda* and *Asthishoolala* prominently appears in AVN also. In later stage of AVN, if not treated earlier, there is an involvement of *Majja* in which symptoms of *Majjaksaya* like *Asthisausirya* (osteoporosis), *Siryantaivacasthini* (eleterioration of bone ) and *Durbalaasthi* (weakness of bone) appear causing death of bone tissue and collapse of bone.

*Acharya Dalhan* has mentioned that *Purishdhara kala* and *Asthidhara kala* are one and the same.<sup>9</sup> Hence causative factors responsible for vitiation of *Purishvahasrotas* also guilty for producing pathogenesis of *Asthikshaya*. The causative factors for vitiation of *Purisavahasrotas* are suppression of natural urges like defecation, excessive eating,

overeating during indigestion, weak digestive power and thin body constitution. Suppression of urge of defecation leads to *Udavarta* and ultimately to provocation of *Vata*.<sup>10</sup>

### Management

In *Ayurveda*, the treatment of AVN includes: 1) *Nidanaparivarjana* (avoidance of etiological factors), 2) *Sodhana* (biopurification), 3) *Samana* (palliative treatment), 4) *Rasayana* (rejuvenation) and 5) *Pathyapathya* (proper diet).

**1. *Nidanaparivarjana*:** - The person suffering from AVN must avoid excess in etiological factors which provoke *Vata*, *Pitta*, along with *Asthivaha*, *Majjavaha* and *Purishavahasrotas* and also some psychic factors such as worry, fear, grief, anger, etc. Hence the physician should not recommend *Tiksna* drugs. Excessive biopurification and injury to vital organs should also be prohibited along with opposing treatment, as they lead to *Asthiksaya*.

**2. *Biopurification*:**- Taking into consideration vitiation of *Vata* and *Pitta* as *Vikaraprakrti*, *Asthi* and latter on *Majja* is the main *Adhithana* (site) resulting in *Asthiksaya* and *Majjaksaya* in the pathogenesis of AVN, the treatment plan of *Vata* and *Pitta Upakrama* along with *Asthimajjaksaya Chikitsopakrama* should be applied in this disease.<sup>11</sup> Acharya *Hemadri* has also supported this. *Vagbhata* describes *Mridu Samsodhana* as the line of treatment in vitiation of *Vata*. *Mriduvirechana* (by *Erandataila* with milk, decoction of *Aragvadhapatra*, *Triphalachurna* or decoction of *Draksha*) can be used for *Mala* and *Vataanulomana*. Similarly, *Mriduvirechana* is also helpful for pacifying *Pitta* as it is specific *Sodhana* procedure for *Pitta*.

**3. *Palliative treatment*:**- This can be done by using *Saman Ausadhis* which are *Vata Pittaghna* and *Raktasuddhikara* in nature. Some *Saman Ausadhis* are detailed below:

#### ***Panchatiktagana*:**-

This contains *Patola* (*Trichosanthes cucumerina*), *Vasa* (*Justiciabedomei*), *Guduchi* (*Tinospora cordifolia*), *Nimba* (*Azadirachta indica*) and *Katuka* (*Picrorhiza kurrooa*)<sup>12</sup> A combination of these drugs is useful because of its *Tikta Rasa*, *Amapacaka* and *Raktapittasamaka* properties. There are various formulations with these drugs like *Panchatiktaghrta Guggulu*, *Panchatikta Ghrita*, etc.

- External and internal oleation therapies are helpful in AVN.

External:- *Abhyanga* by *Kshirabalataila*, *Chandanabalalaksaditaila*, *Dhanvantarataila*, *Balaguduchyaditaila*, *Balasvagandhaditaila*, *Laksaditaila*, *Mahalaksaditaila*, etc. are used for pacification of the *vata*, *Pindataila* (A.H.Ci.22/22) is a good pain reliever in AVN.

Internal: - *Gandhatailam* (A.H.D.27/41) is *Asthisthairyakrit* and is useful for pacifying *Vata* and *Pittajanitavikara*.

- *Ghee* formulations: - *Panchatikta Guggulughrita*, *Patoladighrita*, *Mahatiktakaghrita*, *Panchatiktaghrita*, *Tiktakaghrita* and *Indukantaghrita*.

- *Guggulu Kalpa*: - Various *Guggulu* formulations mentioned in the treatment of fractures and disorders of *Vata* can be given to the AVN patients who suffer from different types of pain. These preparations are: *Abhaguggulu*, *Mahayogarajaguggulu*, *Laksadiguggulu*, *Adityapakaguggulu* and *Yogarajaguggulu*.

*Kshirapaka*: - *Arjunakshirapaka* (*Arjuna -Terminalia cuneata*, is rich in calcium) and *Asvagandhaksirapaka*.

**4. *Rasayana*:** Various *Rasayana* preparations like *Dvitiya Brahmarasayana*, *Cathurtba Triphalarasayana*, *Chavanaprasarasayana* and *Silajatu Rasayana* with milk are useful in *Asthiksaya*,

**5. *Pathyapathya*:**- AVN patients should follow a healthy dietetics and lifestyle.

o *Pathya* (wholesome): - Sweet taste dominant substances, rice, black gram, milk, whey, butter milk, butter, ghee, meat soup, anti-*Vata* oils, regular exercise and exposure to early morning sun rays.

o *Apathya* (unwholesome):- Pungent, bitter, astringent taste dominant substances; dry, cold, light, porous property predominant substances; *Madya* (alcohol); *Suskamamsa* (dry meat). *Suskasaka* (dry vegetable); excessive eating, fasting, heavy exercise; excessive sexual intercourse; fighting with stronger person; day sleep, night awakening; suppression of natural urges; smoking and other etiological factors.

**Conclusion:-**

AVN is a osteonecrosis disease which is *Kotha* of *Asthidhatu*. Etiological factors responsible for Vitiation of *Vata*, *Pitta* and *Rakta* leads to *Kshaya* of *Asthi* and *Majjadhatu*. Symptoms of AVN are very much similar to *Asthimajjakshaya* and *Vataprakopaka Lakashana*. Administration of *Vasti* containing *kshira*, *Ghrita* and *Tikta Dravyas*; by oral use of *Samana Dravya* and *Rasayana* along with wholesome dietetics and lifestyle AVN can be managed.

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