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Case Report

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Restoring Functional Mobility of Hip Joint in a case of Stage 2 AVN of Head of Femur with Multiple Non-Invasive Complementary Therapies

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Abstract

AVN *is a degenerative bone condition characterized by the demise of cellular components of the bone secondary to disruption in the subchondral blood supply. It is also known as Osteonecrosis & it typically affects the epiphysis of long bones at weight-bearing joints. Commonest site for AVN is the femoral head. Advanced disease might result in subchondral collapse, which further threatens the mobility & viability of the joint. Hence early diagnosis and prompt treatment of AVN is very important.*

We hereby wish to present a case of 33 year old young man who had stage 2 AVN of head of femur on Right side & stage 1 AVN on Left side. He was treated with our Unique Non-Invasive Treatment Method wherein we combined & implemented multiple therapies which included- Physical Therapy, Acupuncture & Panchakarma (Ayurvedic Therapy). After a therapy session lasting for 10 days, we could see significant reversal of symptoms in this patient & could restore functional mobility & viability of joint back to normal.

Keywords: AVN, Avascular Necrosis, Physical Therapy, Acupuncture, Panchakarma, Non- Invasive Therapy

Introduction

AVN [Avascular Necrosis] of the head of femur is the death of cells of femoral head as a result of the disruption & compromise in vascular supply. AVN of the hip results in pain around the hip joint which is insidious in onset & eventually it advances to collapse of affected joint & seriously affects functional mobility of joint. The cause is generally multifactorial and more commonly seen in males compared to females. Furthermore, the age of presentation from symptomatic AVN of the hip is younger than that of osteoarthritis. The treatment of AVN of the hip is controversial and as such, there are many different treatment options for AVN. The ideal treatment option depends on the severity and stage of the disease [1].

This condition most frequently affects the femoral head. At the time of diagnosis, patients are often in their third, fourth or fifth decade of life. The sex ratio for this disease is around 4 to 1, with men being more susceptible than women.

Individuals are initially asymptomatic, but with time, AVN causes joint damage, necessitating surgical intervention and in the later stages, Total Hip Replacement (THR) [2].

AVN accounts for 10% of all hip arthroplasties and typically affects people between the ages of 30 and 65. On the whole, men are more likely to experience AVN, although autoimmune diseases that affect women, including lupus, are also important [3].

Early identification can significantly affect outcomes. Diagnosis is made by pairing the clinical presentation with appropriate imaging. Imaging can include x-rays, radionuclide bone scanning, and magnetic resonance imaging (MRI). The use of imaging in the context of the patient's symptoms can help guide appropriate treatment [4].

Case Report

A 33 year young man presented with history of pain in Right Hip joint radiating to anteromedial thigh & groin, pain and difficulty while walking, difficulty to squat & sit cross legged, cramps in thigh region while sitting on the bike. The pain was aggravated on walking and climbing stairs. He was suffering from these complaints since last 4 months. Symptoms were progressive. He consulted nearby physicians a couple of times who prescribed him NSAID group of drugs to relieve pain but it did not help much & pain severity was increasing gradually.

There was no past history of trauma, no history of alcohol addiction, no history of corticosteroid use, no history of COVID 19 infection.

On examination patient had difficulty in walking & an obvious antalgic limp gait could be seen. His MRI scan revealed grade 2 AVN involving right femoral head & grade 1 AVN involving left femoral head.

He was admitted for a 10 day's therapy session for our Unique Treatment Method combining multiple therapies simultaneously under one roof & practiced harmoniously comprising of Physical Therapy, Acupuncture & Ayurvedic Panchakarma.

At the end of the session we could restore full scale functional mobility of his Rt. Hip joint, pain reduced significantly. Scale in visual analogue was reduced from 8/10 to 4/10. It was a normal gait then & he could squat & sit cross legged which is an obvious sitting position in Indian population We have planned more such Conservative Therapy sessions in this patient to arrest or to delay the progression of the disease & to maintain the viability of joint intact, although we don't know how the disease would behave in this patient in upcoming future. We might need further follow up of patient for longer duration to keenly observe his symptoms with radiological evidence to judge the status of the disease.

Treatment Given

Physical Therapy: Intervention was initiated and consisted of two phases: non-weight-bearing phase and weight- bearing phase. In phase A, Non-weight bearing exercises included ankle-toe movements with 20 repetitions for 3 times/day, isometric exercises to quadriceps, hamstrings and glutes for 10 repetitions with 5 seconds hold 2 times/day, strengthening exercises to hip, knee and ankle 10 repetitions with 5 seconds hold 2 times/day, ROM exercises in supine and standing 10 repetitions 2 times/day. Phase B contained weight-bearing exercises, ambulation with walker for 10 minutes thrice a day.

Acupuncture Therapy: It is a traditional Chinese therapy which explains acupuncture as a technique for balancing the flow of energy or life force-Known as Chi or qi (Chee) -believed to flow through pathways (Meridians) in our body. Acupuncture involves the insertion of very thin needles through our skin at strategic points on our body. By inserting needles into specific points along these meridians, our energy flow gets rebalanced, achieves equilibrium of Yin and Yang which ultimately helps in curing disease and restoring health.

Acupuncture points given were- GV 20, LI 11, ST 31, ST 34, ST 36, SP 6, GB 34, ST 41, ST 44, K 3, SP 6, SP 9, SP10, GV14, UB11, GV 4, GV 3, GB 30, LI 4, UB2 5, UB 27, UB 54, UB 36, UB 37, UB 40, UB 56, and UB 62, Ah-Shi points

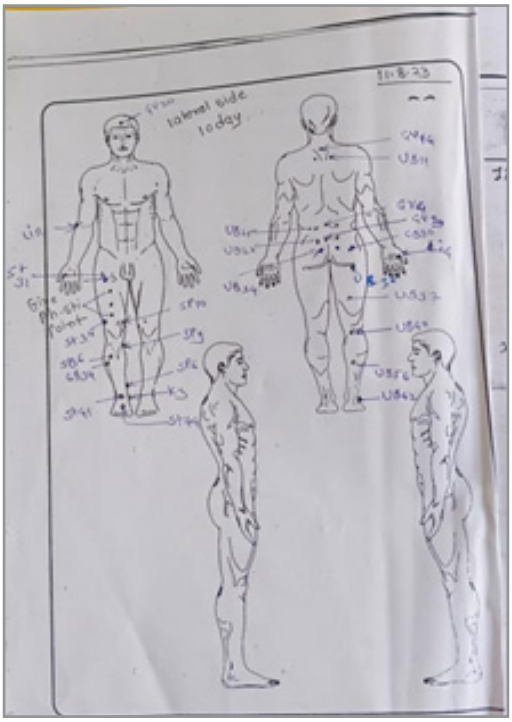

Figure 1.

Panchakarma Therapy: It is a treatment program for the body, mind and consciousness that cleanses and rejuvenates. It is based on Ayurvedic principle that every human being is an unique phenomenon manifested through the five basic elements of Ether, Air, Fire, Water and Earth. Combination of these elements is 3 doshas (Tridosha)-Vata, Pitta and Kapha, and their balance is unique to each individual. When this doshic balance is disturbed, it creates disorder resulting in disease.

Panchakarma is done individually for each person with their specific constitution and specific disorder in mind, thus it requires close observation and supervision. Treatment starts with pre- purification measures of Snehan & Swedan followed by Pradhan Karma according to disorder.

This patient was given

Snehan: Refers to the massage of medicated oil over whole body for a specific period. Swedan- Swedana means to "perspire". It is used in Ayurvedic treatment, also known as Steam Therapy.

Basti: It is the introduction of herbal decoction and medicated oils into the colon through the rectum. He was given Tiktakshir basti with Mahatikta Ghruta.

Discussion

AVN-Avascular necrosis is a degenerative bone condition characterized by the death of bone cells as a result of a disruption of subchondral blood supply. It is also known as Osteonecrosis, Aseptic necrosis and Ischemic bone necrosis. It typically affects the long bones' epiphysis at weight-bearing joints [5]. Only a few anastomoses connect the head of the femur's restricted blood supply to an area of avascular necrosis (AVN) It typically causes irreversible joint degeneration which results in severe impairment from pain and movement restrictions [6, 7].

Etiology

The mechanism(s) by which hip AVN develops remains unclear. For the most part, hip AVN is believed to result from the combined effects of genetic predisposition, metabolic factors, and local factors affecting blood supply including vascular damage, increased intraosseous pressure, and mechanical stresses [8-10].

Potential causes of AVN are classified as traumatic & Non-Traumatic

- Traumatic Causes are: Fracture of the femoral head & Hip dislocation
- Non-Traumatic Causes are: Fatty infiltration of bone marrow due to prolonged high- dose corticosteroid use, Chronic Alcoholism, Lupus erythematosus, Cellular hypertrophy and marrow infiltration (Gaucher's disease), Coagulation disorders such as thrombophilias and hypofibrinolysis, Sickle cell crises, Bone marrow transplant, Antiretroviral treatment, Legg–Calvé–Perthes disease (in children)

Classification

Ficat and Arlet Stage Classification of AVN of Femur

Based upon Ficats classification, Avascular necrosis has different stages:

- Stage 0 is preclinical and pre radiographic, i.e., a “silent hip” Bone marrow pressure studies are abnormal and core biopsy would reveal the histologic patterns.
- Stage 1 is pre radiographic but the patient presents with ischemic pain in the groin with or without radiation down the front of the thigh.
- Stage 2 disease presents with radiographic signs of increased density, diffusely increased porosity and/or cystic changes. The radiographs would show flattening of the contour of the head of the femur, the “out-of-round sign”, and the classic crescent sign in the the head of the femur as the patient’s disorder progresses from the early to late stages.
- Stage 3 is characterized by disruption of the normal round contour of the head and accumulation of sequestrum that might increase or maintain the normal joint space.
- Stage 4 disease presents with complete collapse of the femoral head into a flattened contour and decreased joint space [11].

Management

To treat a case of AVN is a real dilemma as there is no gold standard treatment available. Management of avascular necrosis of the femoral head ranges from conservative to invasive. The prompt therapy to be used depends on many factors and each patient must have their case evaluated individually for optimization. These factors include the age of the patient, level of pain/discomfort, location and extent of necrosis, comorbidities and of course, whether the collapse of the articular surface has occurred or not. Treatments are best implemented at the pre-collapse stage and include both operative as well as non- operative options. If left untreated, femoral head necrosis may lead to subchondral fractures within only 2 to 3 years [12, 13].

The goal of therapy is to preserve the biological hip joint for as long as possible while also taking into consideration quality of life issues such as patient age, mobility, occupation, and lifestyle. Three main therapeutic options for management of hip AVN include 1) Non-operative management, 2) joint-preserving procedures, and 3) THR [14].

Non-operative treatment (Alendronate only therapy and bisphosphonates combination) is controversial, with some trials showing the benefit of bisphosphonates in preventing a femoral head collapse and delaying disease progression in early cases with subchondral lucency [15].

Individuals are initially asymptomatic, but with time, AVN causes joint damage, necessitating surgical intervention and in the later stages, Total Hip Replacement (THR). Surgical procedures such as Core Decompression (CD) with or without a non-vascularized or vascularized fibular graft, muscle pedicle bone grafting, osteotomies, and arthroplasty are among the surgical treatments available according to the stage of the disease. The Total Hip Replacement (THR) prosthesis has a finite lifespan, which restricts its application in young adults or middle-aged patients [16].

Avascular necrosis, if not identified in the early stages, may lead to joint collapse and thus eventually to joint replacement. Radiologic staging of the disease is of utmost importance allowing the identification and risk stratification in pre-collapse stages, prognosis, adequate treatment planning.

Conclusion

As per our prevalent knowledge, the disease prognosis for AVN is mostly poor irrespective of the initial management strategy. Progression of the disease includes persistent pain, debilitation and destruction of the joint beyond repair. Therefore, once the patient faces the onset of AVN, there is a high probability that it will continue to advance [17].

In this case we found that, if diagnosed & intervened vigilantly & treated with discipline with Non-invasive Conservative combination therapy of Acupuncture, Panchakarma and Physical therapy in earlier stage of the AVN of head of femur, the affected joint range of motion could be restored back to normal scale & proved to be convincingly beneficial for reducing pain, conserving viability & vitality of affected joint & improving functional independence and quality of life of the patient.

We are quite aware that it's too early to say that there could be a total reversal of disease process, but still we want to make a point that this Novel Non-Invasive Conservative Therapy might significantly delay the progression of disease & impending surgical intervention, keeping in mind age of the patient & finite life span of prosthesis to be used afterwards.

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