

Case report



## ASEPTIC NECROSIS OF FEMORAL HEAD IN PATIENT AFTER VIRAL INFECTION, TREATED FOR A HERNIATED DISC

Gergana Gecheva-Fermendzhieva

*Physiotherapy and Rehabilitation Department, Trakia University, Stara Zagora, Bulgaria.*

### ABSTRACT

This case presents a patient with severely painful and limited gait when he was admitted to the Department of Physical and Rehabilitation medicine. The complaints of limited gait and pain in the area of hips gradually increased over a year after a severe viral infection that was treated with corticosteroids. At the beginning the complaints were in the lower back area which is why the patient underwent an MRI of the lower back where changes in the intervertebral discs were detected. The patient began a treatment for herniated disk which had a temporary and insufficient effect. When admitted to the Department, X-Ray images of hips were taken and the patient was diagnosed with aseptic necrosis of the hip's head known as Morbus Chandler. The case presents a successful rehabilitation due to correct diagnosis, made before beginning any rehabilitation and subsequently referring the patient for surgical treatment

**Aim.** The aim is to highlight the importance of correct diagnosis for successful rehabilitation of aseptic necrosis of the hip joints.

**Materials and methods:** One 68-years male was included in this study. X-RAY of pelvis and MRI of lumbar area were performed. Neurological and orthopedic examination and gait assessment were performed.

**Result:** The patient was correctly diagnosed and referred to surgical treatment. Intensive rehabilitation and kinesiotherapy were performed, which restored the patient's general condition and improved his gait.

**Conclusion:** We consider it necessary to recall that the symptoms of a herniated disc and hip joint diseases overlap in most cases and it is of utmost importance in differential diagnosis to distinguish. A pelvic X-ray or hip MRI is necessary to make the diagnosis and differentiation.

**Keywords:** aseptic head necrosis of femur, X-RAY, MRI, Chandler disease, herniated disk, COVID-19,

### INTRODUCTION

The avascular necrosis of the head of the femur, known as Chandler disease, is caused by disruption of the blood supply of the femur's one or both heads. This condition results in a reduction of the range of motion of the hip and its dysfunction [1]. This disease immobilizes patients and disrupts their gait. The necrosis of the hip head advances traumatically or non-traumatically. Most authors associate non-traumatic progression with excessive use of corticosteroids in the treatment of severe infection [2]. Not less importance for the occurrence of aseptic necrosis is given to abuse of alcohol, autoimmune diseases such as systemic lupus erythematosus or sickle cell anemia; radiation exposure [3]. The stage of avascular necrosis determines the treatment which can be conservative in the early stages or surgical in the advanced stage. The surgical treatment requires total hip replacement [4].

COVID-19 is a viral infection that was discovered in China in 2019. This infection rapidly expanded and developed into a pandemic [5, 6]. In addition to the cardiopulmonary complications that COVID-19 causes, such as myocardial ischemia and pneumonia, it is crucial to be aware of non-pulmonary complications, such as strokes, renal failure, and avascular necrosis [7]. In this study we report a patient with necrosis of the femoral head as a complication after recovering from COVID-19 infection.

The first signs of osteonecrosis of the femoral head are frequently asymptomatic. With disease progression, the following symptoms are presented: pain that radiates from the hip to thigh, pain in the area of the inguinal fold, limited and painful range of motion of the hip joint while walking and on physical examination [8]. A characteristic feature of this disease is the rapid progression of symptoms, which leads to disability of the patient if not diagnosed correctly. In the differential, aseptic necrosis of the femoral head must be distinguished from a disc herniation at a higher L2-L3 level in the lumbar region. A good tool for differentiating the two diagnoses is MRI. Furthermore, diagnosis of the condition and determination of the stage are based on MRI imaging at early stages or suspicion for Chandler's disease. In more advanced lesions, the

plain radiography is justified. The only definitive treatment to facilitate the patient's activities of daily living is total hip alloplastic surgery [9].

### CASE DESCRIPTION

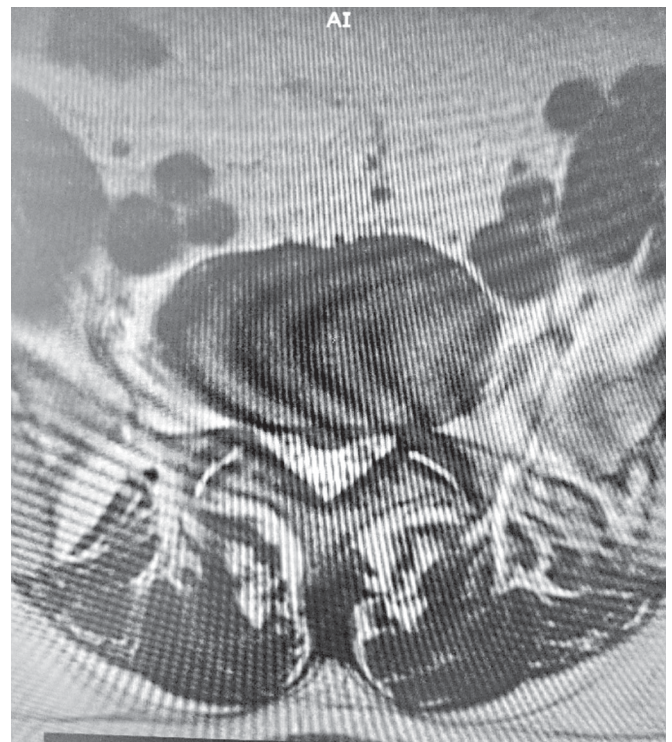
The patient presented in this case is a 68-year-old male. He attended the Department of Physiotherapy and Rehabilitation for the first time at the end of 2023 with complaints of worsening pain in both hip joints that began several months ago, mainly the left one. The pain radiates along the anterior surface of the left thigh to the knee. The patient presented with difficulty walking and a painful gait that had been occurring for five months. The complaints initially began with intermittent lower back pain that subsided with rest. The patient periodically felt sharp pain in the pelvic area and inguinal folds, as well as lower back pain. Based on anamnestic data, the patient had no history of smoking or excessive drinking but was being treated with corticosteroid, immunosuppressants, and other drugs for 2 months for COVID-19 severe viral infection. He has been assigned home therapy, and the GP prescribed the medication. After recovering from a COVID-19 infection the pain in the lower back and both hip joints has increased. He attended the Neurology Department and a lumbar spine MRI was performed to find the cause of the complaints. (Fig. 1)

**Fig. 1.** MRI sagittal section. Levels L1-L4 - Age-normal degenerative transformation of the vertebrae. Level L5-S1 - posterior disc extrusion.



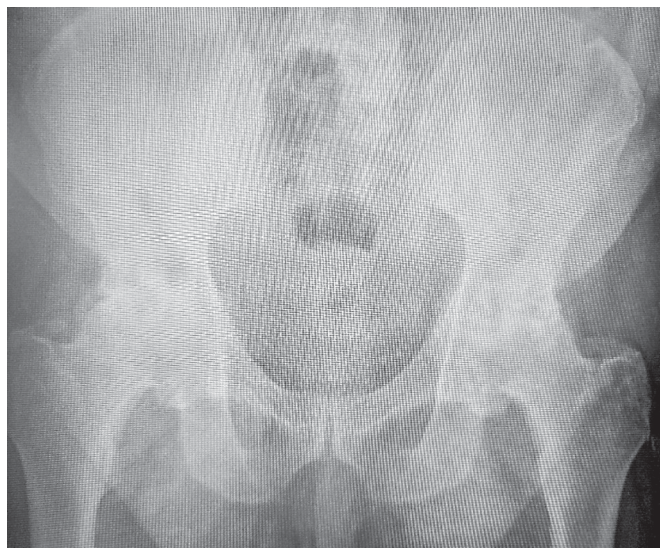
MRI images showed preserved shape and size of the vertebral bodies without traumatic changes. Initial seals on the apophyseal surfaces of the vertebral bodies are an expression of initial degenerative transformation. Normal sagittal characteristic of discs. Moderate anterior and posterior marginal osteophytosis and facet hypertrophy. Schmorl's body is in the inferior discal surface of L3 with mild intrapulposus herniation. Levels L1-L4 - normal disc imaging, normal size, no herniations or protrusions. Level L5-S1 - large posterior median disc extrusion 4.3/7.5 mm/ with stenosis of the vertebral space. (Fig. 2)

**Fig. 2.** MRI axial section. Level L5-S1 - a large posterior median disc extrusion 4.3/7.5 mm/



The patient was treated for the herniated disk with corticosteroids again. A month after the hospitalization, the patient had not improved at all, and even the complaints had worsened to the point of severely impaired gait. Since the patient attended the Department of Physiotherapy and Rehabilitation with an antalgic gait, Trendelenburg type, and severe limitation of range of motion of both hip joints in the clinical examination were found, he was recommended to take an X-Ray of the pelvic, including hips joints. We assessed that the reason for his disability to walk is not the herniated disk diagnose. The X-ray data helped to diagnose bilateral avascular necrosis of the femur head. (Fig. 3)

**Fig. 3.** X-Ray of the pelvis indicated necrotic spots changes on both heads of hip joints due to advanced femoral head avascular necrosis.



The patient began treatment with the methods of kinesiotherapy, and he was prescribed a rehabilitation program for this diagnose. The rehabilitation course lasted 10 days and included underwater therapeutic gymnastics, kinesiotherapy, aqua spinning, low-frequency magnetic pulse field, electrical stimulation of the hypotrophic muscles of both thighs, light and heat treatment to improve blood circulation to this area.

#### **MATERIALS AND METHODS**

1. Participants. One male patient was included in the study with a previous Covid-19 infection and difficulty in walking due to limited range of motion in the hip joints
2. X-Ray was used to differentiate the two diagnoses and visualize the avascular necrosis of both hip joints
3. Clinical Examination of the patient. A detailed orthopedic examination was performed, and rehabilitation potential was determined. The range of motion of both hip joints was evaluated. A manual muscle test was used to measure the power of hip muscles on both lower limbs. Centimetry is used to measure the level of hypotrophy of muscles. Gait analysis was assessed.
4. Physiotherapy and kinesiotherapy methods were used

#### **RESULTS**

The patient completed the assigned rehabilitation program and performed the same procedures every day. The pain syndrome decreased VAS scale from 8/10 upon admission to 6/10 at the end of the course, but the objective orthopedics status after a 10-days course of treatment was not completely improved. ROM of both hips remained limited - internal and external rotation of the joints remained incomplete, the flexion remained painful. Manual muscle testing test on the quadriceps femoris muscle increased from 4-/5 to 4+/5. The results of the centimeter test to determine muscle hypotrophy did not show any change in muscle volume. Gait analysis – bilateral hip limping and inability to walk distance were unconverted. No changes in the number and size of necrotic spots were visualized on the X-ray.

#### **DISCUSSION**

The results on the orthopedic status from the rehabilitation program in this patient were not satisfactory. Despite the reduction in pain while walking, the range of motion in the hip joints remained limited, which is a prerequisite for difficulties in activities of daily living. Due to these results and other studies on the occurrence of avascular necrosis of the femoral head after COVID-19 infection, the patient was recommended to consult an orthopedist and undergo hip replacement [10]. We consider that physiotherapy in patients with Chandler's disease may have a good but temporary effect, and total hip replacement would lead to an improvement in the quality of life of these patients in the long term.

#### **CONCLUSION**

Chandler's disease in patients surviving COVID-19 has been studied as one of the most common complications. Several authors document in their studies that corticosteroid usage is the cause of avascular necrosis. The disease affects mostly adults aged 50-60, but it is observed that the age of those affected is decreasing and could be presented unilaterally or bilaterally [11]. In early detected cases, conservative treatment could preserve the ROM of hip joints and prevent further progression. However, late presented patients are recommended for surgical intervention. Anamnestic protocol and hips X-Ray for patients with severe pain and limited gait who had survived COVID-19 and had received corticosteroids is mandatory for achieving good treatment results.

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*Please cite this article as:* Gecheva-Fermezdzheva G. Aseptic necrosis of femoral head in patient after viral infection, treated for a herniated disc. *J of IMAB.* 2025 Apr-Jun;31(2):6291-6294. [Crossref - <https://doi.org/10.5272/jimab.2025312.6291>]



### Address for correspondence:

Dr Gergana Gecheva – Fermezdzheva  
Medical center "Pavel banya" ltd  
16, Petko Kolev Str., Pavel banya, Bulgaria.  
E-mail: [dr.ggecheva@abv.bg](mailto:dr.ggecheva@abv.bg),