

THE EFFECT OF PHYSIOTHERAPY AND REHABILITATION PRACTICES IN MULTIPLE SCLEROSIS PATIENT WITH FEMUR HEAD AVASCULAR NECROSIS: A CASE REPORT

Femur Başı Avasküler Nekrozu Olan Multiple Skleroz Hastasında Fizyoterapi ve Rehabilitasyon Uygulamalarının Etkisi: Olgu Sunumu

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ABSTRACT

The aim of this study was to investigate the contribution of physiotherapy to the improvement of joint range of motion, pain and functional capacity in Avascular Necrosis (AVN). Our case diagnosed with Multiple Sclerosis (MS) 22 years ago developed AVN due to Corticosteroid (CS) use for 1 year. Patient was evaluated Visual Analog Skala (VAS), Katz Daily Life Activities Scale (Katz ADL), Harris Hip Score (HHS), International Ataxia Rating Scale (IARS), Single Leg Stance Test (SLST), Four Square Stepping Test (FSS), Berg Balance Scale (BBS), Timed Up-Go Test (TUG), Dynamic Gait Index (DGI), Fatigue Severity Scale (FSS). Our patient was followed up with a physiotherapist in the clinic for 3 weeks with exercise and manual therapy and the next 3 weeks with a home exercise program. A 75% improvement in pain, a 5° increase in right hip flexion, abduction, and internal rotation, 15° in left hip flexion, and 10° increase in left hip abduction and external rotation were noted after treatment. 20° increase in lumbar flexion, 5° increase in lumbar extension, right/left lateral flexion and right/left rotation were recorded. Katz ADL, HHS, IARS, BBS, DGI, FSS, SLST (right/left), FSS, TUG improved by 1, 28, 2, 3, 3, 7 points, 1/5, 4 sec, 8 cm, respectively. The physical therapy applications applied in our study were minimally effective in reducing pain and the course of the disease.

Keywords: Multiple Sclerosis; Avascular Necrosis; Corticosteroid; Physical Therapy

ÖZET

Bu çalışmanın amacı avasküler nekrozda görülen eklem hareket kısıtlılığı, ağrı ve fonksiyonel kapasitenin iyileşmesine, fizyoterapinin katkısını araştırmaktır. 22 yıl önce Multiple Skleroz (MS) tanısı alan olgumuz 1 yıldır Kortikosteroid (KS) kullanımına bağlı Avasküler Nekroz (AVN) gelişmiş. Hastaya Görsel Analog Skalası (GAS), Katz Günlük Yaşam Aktiviteleri Ölçeği (Katz GYAÖ), Harris Kalça Skoru (HKS), Uluslararası Ataksi Derecelendirme Ölçeği (UADÖ), Tek Bacak Duruş Testi (TBDT), Dört Kare Adım Testi (DKAT), Berg Denge Skalası (BDS), Zamanlı Kalkma Testi (ZKT), Dinamik Yürüyüş İndeksi (DYİ), Yorgunluk Şiddet Ölçeği (YŞÖ) değerlendirmeleri yapıldı. Hastamız fizyoterapist eşliğinde 3 hafta klinikte egzersiz ve manuel terapi ve sonraki 3 hafta ev egzersiz programı şeklinde takip edildi. Tedavi sonrası ağrıda %75'lik iyileşme, sağ kalça fleksiyon, abduksiyon, iç rotasyonda 5°, sol kalça fleksiyonda 15°, sol kalça abduksiyon ve dış rotasyonda 10° artış kaydedildi. Lomber fleksiyonda 20°, lomber ekstansiyonda, sağ/sol lateral fleksiyon ve sağ/sol rotasyon 5° artış kaydedildi. Katz GYAÖ, HKS, UADÖ, BDS, DYİ, YŞÖ, TBDT (sağ/sol), DKAT, ZKT sırasıyla 1, 28, 2, 3, 3, 7 puan, 1/5, 4 saniye, 8 cm iyileşti. Çalışmamızda uygulanan fizik tedavi uygulamaları ağrıyı ve hastalığın seyri azaltma konusunda minimal düzeyde etkili oldu.

Anahtar Kelimeler: Multipl Skleroz; Avasküler Nekroz, Kortikosteroid; Fizik Tedavi

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INTRODUCTION

Multiple sclerosis (MS) is an inflammatory disease that develops as a result of immune response that affects myelinated axons in the central nervous system and causes significant physical disability (1). Corticosteroid (CS) therapy is the only treatment recommended for the treatment of an acute neurological symptom attack in MS. NICE (The National Institute for Health and Care Excellence) guidelines recommend the use of CS therapy if there are bothersome symptoms or there is an increasing restriction in activities (2).

The general recommendation for the use of CS is to administer an intravenous dose of 1000 mg/day for 3-10 days, and then, if necessary, oral CS is used and the dose is cut by decreasing it (3). In patients with long-term use of CS therapy while complications are generally not seen in intermittent courses of intravenous CS, complications related to the use of oral CS are more likely to occur. Among these complications, Avascular necrosis (AVN) has been reported rarely (4). Physiotherapy may contribute to the improvement of joint limitation, pain and functional capacity observed in AVN. A limited number of cases in which MS and AVN are seen together have been reported in the literature. As far as we know, there are not enough studies investigating the effect of range of motion, strengthening, stretching, balance and stabilization exercises therapy on AVN in MS patients.

In this case report, our aim is to describe the effects of physiotherapy on the hip joint in a patient with MS, who used oral CS for a year and had rare femoral head AVN and associated hip joint limitation.

CASE REPORT

43-years-old female patient, diagnosed with MS 22 years ago and treated for CS for 1 year, applied to the Suleyman Demirel University Research and Application Hospital, Clinic of Physical Therapy and Rehabilitation with complaints of left hip pain, limitation in daily living activities and difficulty in climbing stairs. Before the study, the patient was informed about the study and written consent was obtained. After examining the results of laboratory and imaging techniques together with a detailed physical examination by her doctor, she was referred to a physiotherapist for AVN in the left hip. Our case, who is married and has three children,

stopped working for the last 3 years after working actively for 15 years. Our patient, who did not have a family history of MS, was diagnosed with MS for the first time in 1999 with the complaint of vision loss. she started using prednisolone intravenously for 15 days at the hospital and then orally for 1 year at home. The patient, who had a total of three attacks until 2021, used prednisolone for each attack. Apart from this drug, she occasionally used acetaminophen, for her pain. she practiced the clinical Pilates recommended for MS rehabilitation for 20 minutes once a day for 1 year and benefited. She applied to the orthopedic doctor with the complaint of hip pain and after the examination, a food supplement was recommended. The patient used this supplement regularly for 2 months and stated that benefited.

The patient came to the exercise sessions regularly and did the exercises correctly. For this reason, the patient, whose exercise compliance was generally good, did not encounter any unexpected side effects during physiotherapy.

The physiotherapist took demographic data and medical history. The patient's disability status score was 6 according to the Expanded Disability Status Scale (EDSS), body mass index (BMI) was 24.6 kg/m², and spasticity was 1 in the foot and ankle according to the Modified Ashworth Scale (MAS).

In the evaluation of the patient's range of motion (ROM); there were limitations in all lumbar region movements, especially in left hip flexion, abduction, internal and external rotation. After the treatment, an increase of 5° in right hip flexion, abduction, internal rotation, 15° in left hip flexion, and 10° in left hip abduction and external rotation were recorded. 20° increase in lumbar flexion, 5° increase in lumbar extension, right/left lateral flexion, and right/left rotation were recorded (Table 1).

The patient's left hip pain was 8 according to VAS. Katz Daily Life Activities Scale (Katz ADL), International Ataxia Rating Scale (IARS), Harris Hip Score (HHS), Single Leg Stance Test (SLST), Four Square Stepping Test (FSS), Berg Balance Scale (BBS), Functional Reaching Test (FRT), Timed Up-Go Test (TUG), Dynamic Gait Index (DGI), The Fatigue Severity Scale (FSS) were used to performed the patient (Table 2).

Table 1. Results of normal range of motion evaluation before and after treatment

Range of Motion	Before Treatment	After Treatment
LUMBAR		
Flexion	70°	90°
Extension	30°	35°
Right lateral flexion	30°	35°
Left lateral flexion	35°	40°
Right rotation	30°	35°
Left rotation	30°	35°
HIP Right/Left		
Flexion	110°/75°	115°/90°
Extension	10°/10	10°/10°
Abduction	40°/20°	45°/30°
Adduction	10°/50°	10°/50°
Internal rotation	35°/5°	40°/5°
External rotation	15°/30°	15°/40°
KNEE Right/Left		
Flexion	125°/125°	125°/125°
Hyperextension	0°/0°	0°/0°

Table 2. Results of evaluation parameters before and after treatment

Evaluation Parameters	Before Treatment	After Treatment
VAS	8	2
Katz ADL	4	5
HHS	43	71
IARS		
Posture and posture disorders	11	9
Kinetic functions	2	2
Speech disorders	0	0
Oculomotor disorders	1	1
SLST (sec)		
Right foot	4	5
Left foot	4	9
FSS (sec)	15	11
BBS	45	48
FRT (cm)	24	32
TUG (sec)	62	48
DGI	15	18
FSS	47	40

sec: second, **cm:** centimeter, **VAS:** Visual Analog Skala, **Katz ADL:** Katz Daily Life Activities Scale, **HHS:** Harris Hip Score, **IARS:** International Ataxia Rating Scale, **SLST:** Single Leg Stance Test, **FSS:** Four Square Stepping Test, **BBS:** Berg Balance Scale, **FRT:** Functional Reaching Test, **TUG:** Timed Up-Go Test, **DGI:** Dynamic Gait Index, **FSS:** Fatigue Severity Scale.

In the treatment, exercise and manual therapy program with a physiotherapist in the clinic every other day for 3 weeks, and then home exercise program for 3 weeks, a total of 12 sessions were followed. Conventional exercises were applied both in the clinic and home program as 1 set of 8-10 repetitions per day.

An exercise program was applied in the clinic and at home (Figure 1). In addition to these exercises, myofascial relaxation techniques focused on back and hip limitation, lower extremity nerve mobilizations and sacroiliac joint mobilization were applied.

Figure 1. Exercise program



A. Isometric exercises (abdominal muscles, quadriceps femoris, hip abductors, adductors and extensors), **B.** Heel slide exercise, **C.** Bridge exercise, **D.** Posture exercises, **E.** Stabilization exercises with bobath ball in sitting position with eyes open/closed, **F.** Stretching exercise (gastrosoleus muscles), **G.** Stretching exercise (hamstring muscles), **H.** Balance exercises with eyes open/closed on one leg, **I.** Lumbar ROM Exercises

DISCUSSION

After physiotherapy, hip joint limitation, pain, posture and posture disorders, balance and fatigue level improvement was observed. Besides an increase was noted in activities of daily living and in the level of functional mobility.

Steroid therapy may increase adipogenesis and fat content in the femoral head, leading to increased intracortical pressure, sinusoidal collapse, and osteonecrosis (5). Spasticity and inactivity itself may contribute to the development of AVN in MS patients (6). However, our case was an active patient who was able to perform activities of daily living independently. While we applied the myofascial relaxation technique for limitation in the hip joint, we applied the mulligan mobilization technique and lower extremity nerves stretching for the limitation in the lumbar region. Since the limitation in the hip joint is necrotic and mobilization is contraindicated, we applied only myofascial relaxation technique (7). The locking of the left hip during long walks before the treatment disappeared after the treatment. We think that the locking in the joint experienced by the patient during walking can be eliminated with manual therapy techniques applied specifically for the limitation of the hip joint. It is suggested that patients with stage 1 and 2 osteonecrosis may benefit from a physiotherapy (8). Most patients will eventually need surgical treatment such as decompression or arthroplasty (9). However, this process can be extended with a physiotherapy, or it can be spent more painlessly and more actively.

In addition to these methods, isometric and isotonic exercises were beneficial for our case in terms of improving the harmony, mobility and ROM of the knee and hip, and general MS rehabilitation. A systematic study showed that physical activity has the greatest impact on physical, mental and social health in MS patients (10). The increase in the parameters indicating physical health in our study supports this situation.

In our case, it was noticed that there was only a decrease in the level of adaptation to the changes during walking. We think that this is because we did not include gait training in our treatment program and this is the limitation of our study.

As a result, in the treatment of AVN that can develop in MS patients, physiotherapy reduce pain and provide

a more active life.

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