

Patient with multiple sclerosis diagnosis after fibula fracture: Holistic view of a rehabilitation patient

Raikan Buyukavci, Hatice Kubra Gunes, Ali Recai Ismailoglu, Semra Akturk

Inonu University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Malatya, Turkey

Copyright © 2019 by authors and Annals of Medical Research Publishing Inc.

Abstract

Multiple sclerosis (MS) is a disease with chronic progressive neurological symptoms. Multiple sclerosis patients are frequently observed to have balance problems and falls, and these may occur as initial symptoms. Distal fibula fractures comprise a significant proportion of ankle fractures occurring commonly after trauma or falls. This report presents the case of a 49-year old female patient developing right distal fibula fracture after a fall 4 years previously, who attended the rehabilitation clinic many times due to inability to walk in spite of full union of the bone. Detailed anamnesis included frequent falls and loss of balance before the fracture. The patient had upper motor neuron findings identified, and in light of the clinical findings along with cranial MR images, the patient was diagnosed with primary progressive multiple sclerosis. Attending rehabilitation after fractures at young-middle age, patients should be questioned carefully about the loss of balance and history of falling, and detailed neurological examination should definitely be performed in addition to an orthopedic examination.

Keywords: Multiple Sclerosis; Fibula Fractures; Balance; Rehabilitation.

INTRODUCTION

Distal fibula fractures are commonly encountered in emergency and orthopedic clinics. They most commonly occur after trauma and falls in adults. Isolated fibula fractures comprise the majority of ankle fractures in middle-aged women and each year are seen in 1-2 of nearly every 1000 white women (1). In older adults, the most important risk factor for fibula or tibia shaft fractures is bone mass. Factors reducing bone mass have more effect compared to general health status or fall risk factors. Many studies have shown that among elderly adults, women experience more fibula fractures. Patients treated with surgery or monitored conservatively at appropriate times after fractures may not require physical therapy (2). Patients treated conservatively may have difficulty walking linked to ankle mechanic problems as a result of pain or misunion, though in low numbers, and be included in physical therapy programs. For patients experiencing difficulty walking and balance problems, it is important that the necessary neurological examinations are performed to exclude primary neurological diseases.

MS is a chronic inflammatory progressive disease of the central nervous system with diagnosis typically made

between the ages of 20 and 50 (3). Though MS has many clinical subtypes, a rarer form (15%) begins at older ages and progresses rapidly after initiation compared to the other types and is defined as primary progressive MS (PPMS). Primary progressive MS has a similar range of symptoms to the clinical status of MS progressing with attacks. Characteristic features of PPMS are the presence of loss of strength, spasticity, increasing difficulties walking due to sphincter involvement and myelopathical pain and a typical tendency toward progressive spastic paraparesis (4). From this aspect, patients with difficulty walking and loss of balance may be missed, as in our case. MS patients may be at high risk of injuries linked to falls due to a range of factors. Several common MS symptoms like balance or walking disorders, visual disorders and cognitive disorders are known as risk factors for injuries linked to falls among people whether disabled or not, especially the elderly (5-7). The risk of osteoporosis among MS cases is higher compared to age and gender-linked control groups, and reduced bone density in combination with falls significantly affects fracture risk (8). Here we present a female patient who attended our clinic for rehabilitation due to inability to walk after fibula fracture, with upper motor neuron lesion suspected after

Received: 03.01.2019 **Accepted:** 15.02.2019 **Available online:** 05.03.2019

Corresponding Author: Raikan Buyukavci, Inonu University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Malatya, Turkey, **E-mail:** raikan.buyukavci@inonu.edu.tr

detailed anamnesis and physical examination and who was tested and diagnosed with primary progressive multiple sclerosis.

CASE REPORT

A 49-year old female patient attended our clinic due to difficulty walking after a right distal fibula fracture due to a fall from stairs 4 years previously. After the 4-years previous fall, the patient was monitored with a plaster splint for 45 days before being operated due to nonunion of the fracture line at the orthopedic clinic she attended. Though the orthopedic clinician had said that there was a union of the fracture, she received 30 sessions of physical therapy at a private center due to complaints about the inability to walk. However, she attended our clinic as there was no change in walking difficulties after treatment. Detailed anamnesis revealed that the patient had occasional falls, balance problems and lack of strength complaints up to the time of right distal fibula fracture, with frequent urination and occasional urine leakage. Stating that she had lost up to 10 kilograms in the last 1 year, the patient had become dependent on a person for daily life activities including walking. Physical examination of the patient found no swelling, redness or temperature increase in the right lower extremity. Foot-ankle-knee and hip joint movement angles were natural. The neurological examination found cranial and upper extremity examination was natural, with proximal and distal muscle power in the lower extremities 4/5 bilaterally. Deep tendon reflexes in both lower extremities were live, with Achilles clonus in the right lower extremity. Babinski reflex was responsive in bilateral extensors, with Hoffman reflex and Romber positive. Laboratory investigation found normal values apart from anemia Hb: 6 mg/dl and B12 deficiency. There were no features in history and family history. In accordance with direct radiography of the patient (figure 1), right foot MR identified old trans-syndesmotic fracture, which healed in the chronic period in the distal fibula and accompanying internal stabilization material.



Figure 1. Foot-ankle AP radiography of the patient

Contrast cranial MRI observed FLAIR hyperintense foci with occasional vertical orientation in the bilateral frontoparietal, corpus callosum and deep white matter. Postcontrast studies observed no clear contrast involvement in the defined lesions, with an active demyelinating disease

considered primarily (figure 2). Diffusion MR and contrast thoracolumbar MR of the patient were normal. With these findings, the patient consulted with neurology, had primary progressive multiple sclerosis diagnosis placed and began Ocrelizumab treatment during follow-up.

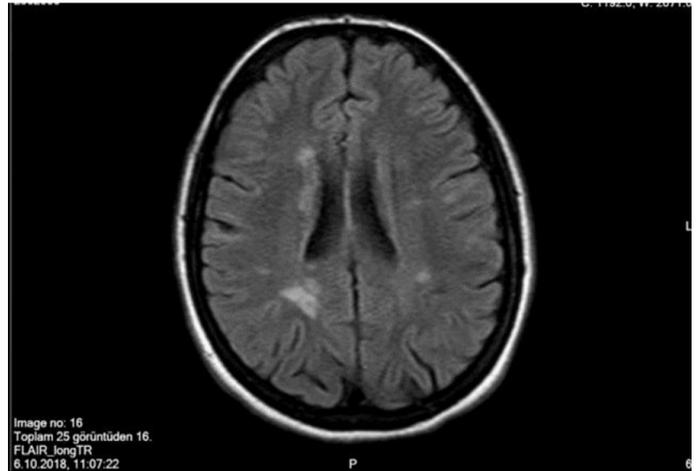


Figure 2. Contrast cranial MRI FLAIR-long TR sequence; hyperintense foci

DISCUSSION

Multiple sclerosis patients are commonly observed to have balance problems and falls, and these may be encountered as the initial symptoms of the disease. Patients attending for rehabilitation after fractures at young-middle age should have their history of falls and balance loss questioned, with detailed neurological examination performed in addition to an orthopedic examination.

Falls are an organism becoming immobilized at a lower level than the previous level due to inattention without syncope, stroke or any coercive force (9). Falls are an important health problem. They may cause injury, fractures and even death. Recurrent falls are defined as falling more than twice within the previous year (10). A person's confidence may be reduced due to fear of falling; thus, independence levels are significantly reduced, and social isolation may develop. Among patients attending doctors due to falls or after falling, those with a repeated history of falling within 1 year and those with walking or balance disorders require detailed assessment. This assessment should include anamnesis and physical examination (10).

Balance disorders and falls are commonly observed in MS patients. Balance disorders may be encountered as the initial symptoms of the disease (11). Epidemiological studies have identified that 23% of MS patients have cerebellar and brain stem involvement at the diagnosis stage and this rate increases to 82% during progression (11). A recent review by Dong et al. stated the fracture risk was clearly increased for MS patients, with significant correlations between tibia and femur fracture risk, vertebral fracture risk and humerus fracture risk, and these were higher for women (12). Su et al. identified that MS patients had high fracture risk, led by similar regions (13).

Due to variations in the distribution of lesions in the brain and spinal cord, clinical presentation of MS is heterogeneous, and most of the time walking problems are a result of multiple disorders. A study by Martin et al. reported that in new-onset MS patients, as the initial symptoms of MS were walking and balance disorders, the disease may begin with disruption of motor functions in the early stages, even though there were no clinical signs of pyramidal dysfunction and that there were significant abnormalities in walking parameters like walking speed and walking length in these patients compared to a control group (14).

CONCLUSION

Research in many countries has shown that MS cases fall more than once in their lives (7,15). The common walking difficulties and falls in MS cases may be associated with many factors. The most common causes, in order, are the presence of balance disorders, loss of strength linked to muscle strength loss, the presence of spasticity, tiredness and reduced proprioception. MS patients frequently have a tendency to walk slowly with broad-based, asymmetric, short step patterns. In this case, different to walking disorders, there was a walking pattern of small steps, broad-based, imbalanced and supported steps after fibula fracture. Apart from the neurological examination, the walking pattern of our patient complied with the MS clinic. In conclusion, all patients attending for rehabilitation, regardless of diagnosis, should be holistically assessed, with a detailed neurological examination in addition to physical examination, and patients should consult with the relevant departments as necessary for suspected diseases that may explain the patient's physical examination.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports

Raikan Buyukavci ORCID: 0000-0002-2234-7158

Hatice Kubra Gunes ORCID: 0000-0002-8044-727X

Ali Recai Ismailoglu ORCID: 0000-0003-4683-5911

Semra Akturk ORCID: 0000-0001-9960-6851

REFERENCES

- Hasselmann CT, Vogt MT, Stone KL, et al. Foot and ankle fractures in elderly White women. Incidence and risk factors. *J Bone Joint Surg Am* 2003;85:820-4.
- Makwana NK, Bhowal B, Harper WM, et al. Conservative versus operative treatment for displaced ankle fractures in patients over 55 years of age. A prospective, randomised study. *J Bone Joint Surg Br* 2001;83:525-9.
- National Multiple Sclerosis Society. Epidemiology of multiple sclerosis. Available at: <http://www.nmss.org>. access date 12 02.2007.
- Miller DH, Leary SM. Primary-progressive multiple sclerosis *Lancet Neurol* 2007;6:903-12
- Tinetti ME, Doucette J, Claus E, et al. Risk factors for serious injury during falls by older persons in the community. *J Am Geriatr Soc* 1995;43:1214-21.
- Nevitt MC, Cummings SR, Hudes ES. Risk factors for injurious falls: a prospective study. *J Gerontol* 1991;46:164-70.
- Cattaneo D, De Nuzzo C, Fascia T, et al. Risks of falls in subjects with multiple sclerosis. *Arch Phys Med Rehabil* 2002;83:864-7.
- Cosman F, Nieves J, Komar L, et al. Fracture history and bone loss in patients with MS. *Neurology* 1998;51:1161-5.
- Alexander BH, Rivara FP, Wolf ME. The Cost and Frequency of Hospitalization for Related Injuries in Older Adults. *Am J Public Health* 1992;82:1020-23.
- Lamb SE, Jorstad Stein EC, Hauer K, et al. Prevention of falls network europe and Outcomes consensus group. development of a common outcome Data set for fall Injury prevention trials: the prevention of falls network europe consensus. *J Am Geriatr Soc* 2005;53:1618-22.
- Williams, Katrina. Balance for people with multiple sclerosis (MS). In Phu Hoang, Robyn Smith and Kathy Hutton Edition, *MS practice for health professionals*. Lidcombe, Australia; 2009. pp. 1-14
- Dong G, Zhang N, Wu Z, et al. Multiple sclerosis increases fracture risk: a meta-analysis. *Biomed Res Int*. 2015;2015:650138.
- Su S, Liu H. The association between multiple sclerosis and fracture risk. *Int J Clin Exp Med* 2014;7:4327-31.
- Martin CL, Phillips BA, Kilpatrick TJ, et al. Gait and balance impairment in early multiple sclerosis in the absence of clinical disability. *Mult Scler* 2006;12:620-8.
- Finlayson ML, Peterson EW, Cho CC. Risk factors for falling among people aged 45 to 90 with MS. *Arch Phys Med Rehabil* 2006;87:1274-9.