

## Letter to Editor

### The Importance of Neurologic Examination in Modern Imaging Era: A Case Study and Discussion

Mohammad Amin Frazi, Somayyeh Hasaneh Tamar\*

Resident of Neurology, Neurosciences Research Center (NSRC), Imam Reza Medical Center, Tabriz University of Medical Sciences, Iran

©2016 Swedish Science Pioneers, All rights reserved.

A 54-year old male patient was admitted in Tabriz Imam Reza Hospital for his lower extremities weakness and urine incontinence that developed 15 days former to admission following 3 days of constipation. Patient had admitted in surgery ward and investigated for probable intestinal obstruction but all surveys was negative and patient developed aforementioned symptoms of paraplegia and urine incontinence. The patient past medical history was positive for diabetes mellitus and a lumbar spine surgery for discopathy 4 years ago.

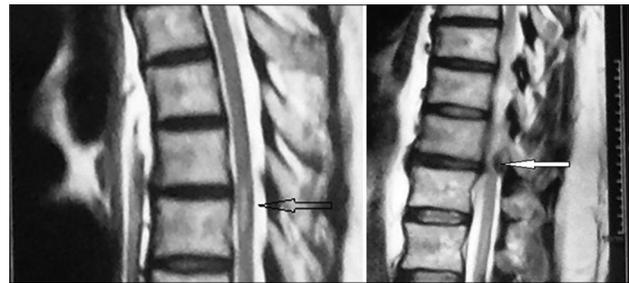
The spinal MRI was obtained from patient. As shown in [Figure 1](#) the MRI revealed a hyperintense focus in the T4 level and a cord compression at the T11- T12 levels.

The patient consulted with neurologist to identify which of these lesions was responsible for patient symptoms?

Neurologist examined patient: On physical examination, but general examination was unrevealing.

On the neurologic examination, the patient was alert and orient to time, place and people. All cranial nerves were intact. Moreover, upper extremity power and coordination was normal. His muscle strength in the upper extremities was 5/5, but that of the lower extremities was 1/5. Deep tendon reflexes were absent from the waist down. Sensation to light touch and pinprick was decreased below the T11 dermatome on both sides. Otherwise, patient had a sensory level at T11.

Finally, by finding in neurologic examination of a sensory level at T11 level it was concluded that the causative lesion is



**Figure 1.** (left): Hypersignal focus in T4 level (arrow) and, (right): cord compression at the T11- T12 levels (arrow).

compressive lesion at T11 and patient underwent decompressed surgery and after surgery there was partial improvement in lower extremities weakness and patient was referred to rehabilitative therapy.

This case clearly explains that clinical examination can provide invaluable information that cannot be obtained from any imaging modality.

Neurologic examination is a difficult and time-consuming process for practicing neurologist. And considerable part of any neurologic textbook is allocated to neurologic examination and in addition there are many textbooks specifically written for this purpose [1]. But medical students and beginner neurology residents when seeing diagnostic procedures in any field of neurology (e.g. MRI, CT scan, electromyography) specially modern imaging techniques and upcoming new modalities may ask himself what is for neurologic examination though we see any pathology directly and easily in neuroimaging and other diagnostic procedures? For instance when seeing a patient with hemiplegia they can easily obtain a brain CT scan or MRI and thus they will visualize any pathology in brain exactly; with precise location, size and even nature of lesion. Considering this conflicts it seems that neurologic examination in unnecessary today. Nevertheless, this remark is very simplistic and answering this question, it was better to first study above mentioned case.

There has been within recent years an interesting tendency to focus more and more on paraclinical methods at the expense of careful clinical history taking and physical examination.”

#### Correspondence

Somayyeh Hasaneh Tamar, Neurosciences  
Research Center (NSRC), Tabriz University  
of Medical Sciences, Iran.  
Tel: +98-41-33370730,  
Email: [s.hasanetamar@gmail.com](mailto:s.hasanetamar@gmail.com)

Received: 2016-06-17

Accepted: 2016-07-05

DOI: [10.13183/jecns.v3i1.53](https://doi.org/10.13183/jecns.v3i1.53)

Neurology has become a very treatment oriented specialty and with the availability of sophisticated imaging modalities of the entire neuraxis, diagnosis poses less of a problem than in the past. Nevertheless, it is not uncommon to neurologists to practice “MRI negative neurology.” The easy diagnoses, such as brain tumor or subdural hematoma, are often made by primary care clinicians or other caregivers who reflexly order a scan in the face of a neurologic complaint, and then refer the patient to the neurologist or neurosurgeon.

The practice of neurologists is neurology not radiology. Neurologist gratification and competence comes from seeing the amazing phenomena of neurologic disease (i.e. anosognosia, acalculia,...) not from looking at an imaging [2]. There are many examples of how the neurologic examination fills a void that imaging and other laboratory tests cannot. Only clinically experienced neurologist can make the diagnosis of such conditions as restless legs syndrome, one and a half syndrome, corticobasal degeneration, epilepsia partialis continua, subacute combined degeneration, hereditary spastic paraplegia and Pseudotumor cerebri [3].

In addition, of course clinically experienced neurologist can make a diagnosis of myasthenia gravis by listening to the patient speech and differentiate that from botulism by examining patient pupil. Also clinically experienced neurologist can apply neuroanatomy in recognizing, and understanding the location of pathology in upper and lower motor neuron disorders [4].

The above mentioned case explains that neurologic exam is still necessary in clinical practice. And in fact imaging techniques sometimes may be actually confusing [5]. Considering these facts the following statements point necessity of neurologic exam

1. Neurologic examination can guide the neurologist to select a suitable modality; for example if patient has eye movement abnormality probably MRI is better than CT as can provide better view from posterior fossa.
2. Sometimes multiple lesions on imaging with different pathology and treatment necessitate identifying the lesion responsible for patient complaint that can be accomplished by clinical examination.

3. Investigating the effects of treatment in conditions such as Parkinson’s disease, dementia or polymyositis is provided by careful examination and no imaging modality can be helpful for this purpose.
4. The neurologist is often consulted to visit patients when the imaging studies are unremarkable, but a neurologic illness is still suspected. There are many situations where obvious abnormalities on neurologic examination are not accompanied by imaging findings, such as Wernicke’s encephalopathy, Creutzfeldt-Jakob disease.
5. Except to exclude the unexpected pathologies imaging studies are of no use in the diagnosis of many conditions seen by neurologists, such as headache, epilepsy, dementia, movement disorders, and neurodegenerative conditions.
6. Neuroimaging is rarely helpful in the investigation and diagnosis of neuromuscular disorders such as myasthenia gravis, Guillain-Barré syndrome and polymyositis. In fact, most of these disorders are clinical diagnosis.

These facts clearly indicate that although current neurologic practice benefits from imaging modalities but it will be disastrous for next generation of clinical neurologists to base their diagnosis and management solely on imaging techniques that are apt to misinterpretation if not associated with careful clinical investigation.

## References

1. Boes, C.J., History of neurologic examination books. *Proc (Bayl Univ Med Cent)*, 2015. 28(2): p. 172-9.
2. Glick, T.H., Toward a more efficient and effective neurologic examination for the 21st century. *Eur J Neurol*, 2005. 12(12): p. 994-7.
3. Averill, D.R., Jr., The neurologic examination. *Vet Clin North Am Small Anim Pract*, 1981. 11(3): p. 511-21.
4. Brunet, P., Role of the clinical examination and scanner in neurologic diagnosis. *Acquis Med Recent*, 1980: p. 83-9.
5. DeMyer, W., Pointers and pitfalls in the neurologic examination. *Semin Neurol*, 1998. 18(2): p. 161-8.