

Case Report**Myasthenia gravis as a presenting feature in a patient with lung cancer:****A case report***Vahid Shaygannejad^{a*}, Majid Ghasemi^b, Zahra Rajaei^c***Abstract**

A male patient with muscle weakness had clinical findings of ptosis, diplopia, proximal leg weakness, and positive repetitive nerve stimulation (RNS) test. He demonstrated positive acetylcholine receptor antibody. This lung cancer patient was presenting myasthenia gravis. The causal association between non-small-cell lung cancer and non-thymomatous myasthenia gravis has not been clarified yet. To date, there has been no evidence supporting the speculation that association of myasthenia gravis with lung cancer might be one of the phenotypes of paraneoplastic syndrome.

KEYWORDS: Myasthenia Gravis, Carcinoma, Non-Small Cell Lung.

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The relationship between presynaptic neuromuscular junction (NMJ) disorder (Lambert-Eaton myasthenic syndrome) and malignant tumors has long been recognized. But the association of extrathymic malignancies with myasthenia gravis (MG) is an attractive topic.

Myasthenia gravis (MG) is an autoimmune neuromuscular disorder, which affects both young and old population. MG is considered as a paraneoplastic syndrome associated with thymoma in 15% of MG patients. Extrathymic malignancies have been also reported to happen simultaneously with MG.¹⁻⁵ In several other autoimmune diseases, such as rheumatoid arthritis, systemic lupus erythematosus, inflammatory myopathies, scleroderma, Sjögren's syndrome and thyroiditis, an association with malignancy has been observed too.⁶

Simultaneous MG with thymoma may also be associated with extrathymic malignant tumors in 3-18% of cases.^{3,7,12,13}

We would describe a case of lung cancer presenting with postsynaptic NMJ disorder (MG).

Case Report

A 62 years old man was admitted to our center. He began to show symptoms of muscle weakness, like gait difficulty, diplopia, dysphagia, and fatigue, 3 months prior to the admission.

His symptoms were worsened in the evening. The course of disease was relatively constant and not progressive.

He had no signs of systemic malignancy including weight loss, decreased appetite, cough, or hemoptysis. The patient had a history of smoking.

In physical examination, proximal muscle weakness in both upper and lower limbs, generalized hyporeflexia, and bilateral asymmetric ptosis were noted.

In cervical and lumbosacral magnetic resonance images degenerative change was shown; but it could not explain patient's symptoms.

We performed standard repetitive nerve stimulation (RNS) test, which is one of the most sensitive diagnostic tests in patients with NMJ disorders, to evaluate patient's muscle weak-

^a Associate Professor, Department of Neurology, School of Medicine and Isfahan Neuroscience Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

^b Assistant Professor, Department of Neurology, School of Medicine and Isfahan Neuroscience Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

^c Resident, Department of Neurology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

* Corresponding Author

E-mail: shaygannejad@med.mui.ac.ir

ness. We first performed nerve conduction study (NCS) in upper and lower limbs that were normal in distal latency, velocity and amplitude. Then 3 Hz (slow) RNS test performed in two warm (33-35°C) trapezius muscles, that were immobilized as best as possible for 10 impulses; then it was repeated three times, 1 minute apart. More than 10% of decrement was seen in amplitude and the area of the first to the fourth CMAP; that was reproducible in all three times. After 10 seconds of maximal voluntary contraction, slow RNS (physiologic modeling of rapid RNS) was performed. To demonstrate post-exercise exhaustion, the muscle was maximally exercised for 1 minute. Slow RNS was

performed 3 and 4 minutes later. The decrement became more remarkable 3 and 4 minutes after exercise. After these procedures, needle electromyography was done in upper and lower limb muscles; that was normal in every parameter. These electrophysiologic findings suggest the presence of postsynaptic NMJ disorder. The findings presented in table 1 and figure 1.

Antibody against acetylcholine receptor was positive. After these findings, to evaluate the presence of thymoma, chest CT scan was done. No evidence of thymoma was noticed; but an incidental lung tumor was seen (Figure 2). Lung closed biopsy disclosed non-small cell carcinoma.

Table 1. RNS test findings in reported patient with non-small cell carcinoma

Muscle/Train	Ampl. mV	d. Ampl1 %	d. Ampl2 %	Area mVms	d. Area1 %	d. Area2 %	Fac Area %	Rate pps
R TRAPEZIUS (U)								
Baseline	4.6	-43.8	-43.7	24.1	-52.7	-55.5	100	3
Facilitation	5.8	-35.2	-36.3	31.7	-41.1	-45.5	132	3
@0:30	5.4	-47.5	-54.2	31.6	-52.5	-58.8	131	3
@2:00	4.8	-57.6	-56.7	27.0	-62.2	-65.4	112	3
@4:00	4.5	-53.9	-58.5	25.6	-59.5	-66.7	106	3
L TRAPEZIUS (U)								
Baseline	6.8	-29.6	-30.8	36.4	-38	-43.3	100	3
Facilitation	6.4	-29.8	-26.4	28.6	-34.6	-38.9	78.8	3
@0:30	6.3	-14.5	-16.2	34.1	-35.3	-41.7	93.9	3
@2:00	8.0	-41	-43.9	37.9	-41.3	-50.2	104	3
@4:00	7.9	-31.6	-35.6	37.3	-40.7	-47.3	103	3

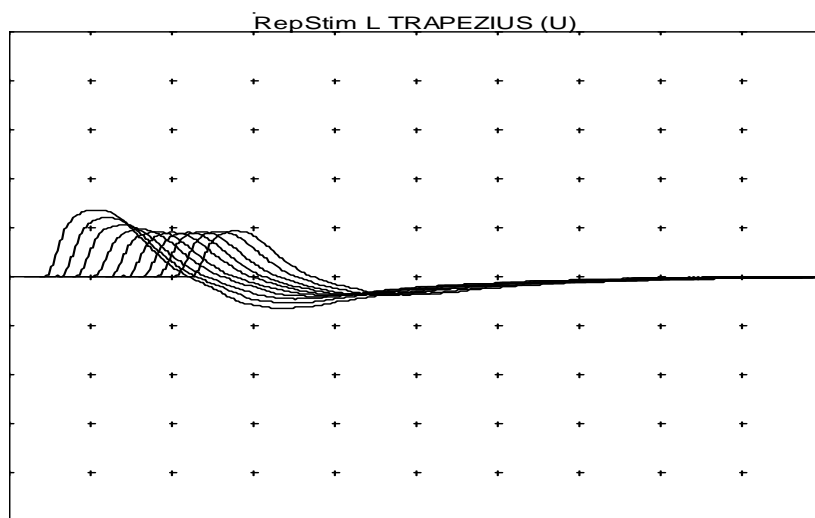


Figure 1. Needle electromyography findings in reported patient with non-small cell carcinoma



Figure 2. Chest CT scan findings in reported patient with non-small cell carcinoma

Discussion

There are few reports on primary lung carcinomas which complicate MG, in the medical literature.¹⁻⁶

According to literature review, there are two types of association between lung cancer and MG.

The more common is the occurrence of lung cancer in MG patients after many years of treatment that can be a coincidental finding.¹⁻⁹ Another type is presentation of cancer simultaneously with MG, which is a rarer report.⁹⁻¹¹

In our case, the opening symptoms of lung cancer showed myasthenic type.

It is generally believed that the prevalence of simultaneous occurrence of MG with extrathymic tumors is incidental; the incidence of extrathymic malignancies in MG patients has

been reported to be different from that in a normal age-matched population not significantly.^{4,14}

To date, no one has found causal relationship between lung cancer and MG.

Similarly, there has been no supporting evidence that simultaneous MG with lung cancer might be one of the paraneoplastic syndromes such as Lambert-Eaton myasthenic syndrome with small cell lung cancer.

In conclusion, this case was a typical MG but his symptoms were the only clinical presentation of his underlying lung cancer; it means that MG can be a paraneoplastic syndrome, such as Lambert-Eaton myasthenic syndrome.

So, we must remember that MG can be a manifestation of systemic malignancy.

Conflict of Interests

Authors have no conflict of interests.

Authors' Contributions

VS carried out the design of the study, found the patients, carried out the physical examinations, carried out the diagnoses and participated in manuscript preparation. MG provided assistance in the design of the study, carried out the tests (EMG, MCV) and participated in manuscript preparation. ZR provided assistance in the design of study and the data analyses, and participated in manuscript preparation. All authors have read and approved the content of the manuscript.

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