

DOI: 10.21767/2171-6625.100066

Case Report of Paraneoplastic Lambert-Eaton Myastenic Syndrome Associated with Small Cell Lung Cancer with Slow Progression

Valentina Reshkova¹, Desislava Kalinova² and Rasho Rashkov³

¹Clinic of Rheumatology, St. Ivan Rilski Multiprofile University Hospital for Active Treatment, Sofia, Bulgaria

²Medical University of Sofia, Ulpia Serdica, Sofia-Capital, Bulgaria

³Department of Rheumatology, St Ivan Rilski Hospital, Urvich 13, 1612 Sofia, Bulgaria

Corresponding author: Dr. Valentina Reshkova, Clinic of Rheumatology, St. Ivan Rilski Multiprofile University Hospital for Active Treatment, 13 Urvich Str, 1612 Sofia, Bulgaria. Tel: 359878622443; E-mail: v_reshkova@abv.bg

Received: Jan 07, 2016; **Accepted:** Jan 28, 2016; **Published:** Jan 31, 2016

Abstract

Lambert-Eaton myastenic syndrome (LEMS) is an autoimmune disease, affecting the resynaptic neuronal transmission. It is the results of an autoimmune reaction in which antibodies are formed against presynaptic voltage-gated calcium channels (VGCC) in the neuromuscular junction. Its clinical features include muscle weakness and autonomic symptoms. LEMS can occur sporadically or as a paraneoplastic syndrome, associated with different cancers-breast, colon, prostate, pancreas, lung. Lambert-Eaton myastenic syndrome is a rare paraneoplastic syndrome associated in 50% with small cell lung cancer (SCLC), with prevalence 1% among patients with SCLC. We presented a clinical case of a 45 years old woman with SCLC with slow progression associated with paraneoplastic Lambert-Eaton myastenic syndrome.

Keywords: Lung cancer; Lambert-Eaton syndrome; Paraneoplastic syndrome

Introduction

Lambert-Eaton myastenic syndrome (LEMS) is an autoimmune disease, affecting the presynaptic neuronal transmission. It is the results of an autoimmune reaction in which antibodies are formed against presynaptic voltage-gated calcium channels (VGCC) in the neuromuscular junction. Its clinical features include muscle weakness and autonomic symptoms. LEMS can occur sporadically or as a paraneoplastic syndrome, associated with different cancers—breast, colon, prostate, pancreas, lung. LEMS is a rare paraneoplastic syndrome associated in 50% with small cell lung cancer (SCLC), with prevalence 1% among patients with SCLC.

We present a clinical case of a 45-years old female patient with complaints of symmetrical, proximal, progressive leg weakness, unstable gait, painful cramps in the calves and the thighs, weakness and tingle of the hands, ptosis of the lids, diplopy. The onset of the described clinical symptoms has been for four years. Transient complaints of muscle weakness,

painful cramps and diplopy have developed for the first time during the second pregnancy of the patient. The patient was hospitalized at Gastroenterology Clinic in the fifth lunar month because of abdominal pain, nausea, vomiting, diplopy and muscle weakness. Then it was diagnosed cholethiasis. By reason of diplopy and ptosis of the lids, it has been discussed in differential diagnosis tumor of the brain, as it was made MRI of the brain, it wasn't determined pathological findings. Because of progressive course of the muscle weakness in the patient, it was made an electroneuromyography, which revealed axonal peripheral polyneuropathy. The planned Caesarean section was made in 38 weeks in the patient. Two months after the childbirth through persistent muscle weakness, it was done new electroneuromyography, as it was diagnosed myastenic syndrome. Because of the doubt about mediastinal tumor, computed tomography of lung and mediastinum (one year after the beginning of muscle symptoms), native and with contrast, was made. It was found a high density zone in X-th bronchopulmonary segment in the right lung, probably postpneumonic fibrosis (**Figure 1**).

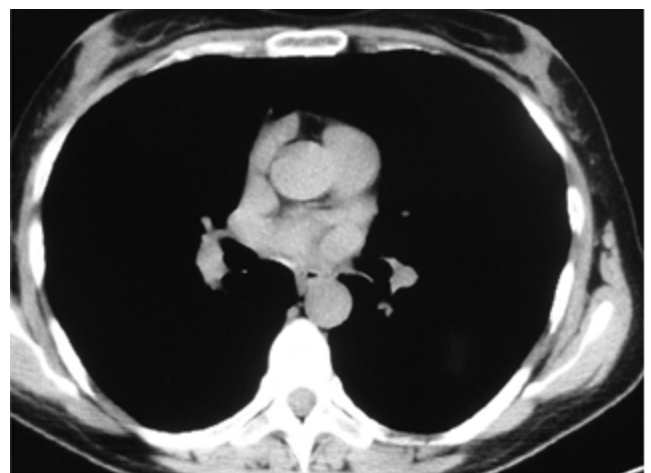


Figure 1 Chest CT (2007). High density zone in 10th bronchopulmonary segment, probably postpneumonic fibrosis

Mantoux test for tuberculosis was performed and it was positive (18 mm), as well as following Quantiferon test, on the

basis it was diagnosed chronic tuberculosis intoxication. It was applied tuberculostatic treatment for four months, without improvement. Following some electroneuromyography confirmed the diagnosis myastenic syndrome. It was diagnosed idiopathic myastenic syndrome as the cancer hasn't been proved in the patient. It was used acetylcholinesterase inhibitors (Pyridostigmine, Kalimin®), with slight improvement of the muscle weakness.

Physical examination revealed: muscle weakness in the proximal muscle groups of the lower limbs; neurological status showed binocular diplopy, ptosis of the lids, decrease muscle tonus, hyporeflexia; pulmonary system—reduced vesicular breath in the middle and inferior lobe in the right lung. Liver, spleen and peripheral lymph node were not enlarged.

Laboratory findings showed increased erythrocytes sedimentation rate (46 mm), C-reactive protein 7.35 g/l (normal <6 g/l) and mild elevated creatinine phosphokinase 310 U/l (<180 U/l).

In differential diagnosis were discussed:

- Lambert-Eaton myastenic syndrome—idiopathic or paraneoplastic
- Polymyositis
- Polymyositis associated with other connective tissue disease
- Dystrophia musculorum progressiva in adults
- Myastenia gravis

Electromyography showed low amplitude of compound muscle action potential (CMAP), decremental response at low-rate repetitive nerve stimulation (2-5 Hz) and marked incremental responses at high-rate nerve stimulation (50 Hz), changes characterized by the myastenic syndrome. It was made a new CT of lung and mediastinum (native), which showed a huge paracardial soft-tissue multilobulated mass (7cm in diameter) with finny spicules with central localization in the right lung, compressing middle and lower lobe bronchi (**Figure 2**).

The results of fibrobronchoscopy revealed narrowed and infiltrated right middle lobe bronchus and narrowed right lower lobe bronchus. Transbronchial needle aspiration biopsy was made (**Figure 3**). Cytological findings (identified by routine staining with hematoxylin and eosin, HE)-increased number of tumor cells “naked nuclei” type with “salt and pepper” chromatin, with marked crush phenomenon, morphologically corresponding to small cell lung cancer cells (**Figure 4**).

The patient began the chemotherapy (Cisplatin/Etoposide) and after six courses of chemotherapy tumor mass in the lung increased. The patient died with clinical features of respiratory failure one month later.

Discussion

Lambert-Eaton myastenic syndrome is an idiopathic or paraneoplastic syndrome producing antibodies against presynaptic voltage-gated P/Q calcium channels. This decreases calcium entry into presynaptic terminal, which

prevents binding of vesicles to the presynaptic membrane and acetylcholine release, resulting in skeletal muscle weakness and autoimmune symptoms [1,2]. LEMS can be divided into two groups depending on whether it is associated with cancer or not [3]. Around 60% patients with LEMS have an underlying malignancy, most commonly small cell lung cancer, it is therefore regarded as a paraneoplastic syndrome [2,4,5]. LEMS occurs in about 1-3% of patients with small cell lung cancer [3,6].

Clinical features include proximal leg muscle weakness, temporary increase in strength after voluntary exercise, double vision, ptosis of the eyelids, difficulty swallowing, disruption of the autoimmune nervous system (dry mouth, blurred vision, orthostatic hypotension) [3]. One of the main clinical symptoms of LEMS is the weakness in the proximal muscle groups, predominantly in the legs. Differential diagnosis of the proximal muscle weakness with slow progression ranges over a variety of nosologic entities – polymyositis, myositis associated with other connective tissue disease, paraneoplastic myositis, myastenia gravis, dystrophia musculorum. Detection of antibodies to the voltage-gated calcium channels and typical electrophysiological features proved the diagnosis LEMS [7,8]. O'Neil et al. indicate that a patient presenting with LEMS has a 62% risk of an underlying small cell lung cancer, as it is diagnosed most frequently in the first 2 years [9]. We presented a clinical case of patient with small cell lung cancer, which has been diagnosed four years after the developing of LEMS. The paraneoplastic LEMS can be the first manifestation of different cancers (lung, breast, stomach, colon, prostate, pancreas), especially small lung cancer. According to Stickler et al. if cancer has not been found in patients presenting with LEMS, they should be screened for small cell lung carcinoma every 6 months with chest imaging for at least 5 years [10]. O'Neil et al. determine that the risk declines sharply after fifth years [9,11].



Figure 2 Chest CT (2011). Huge paracardial soft-tissue multilobulated mass with thin spicules in the right lung, compressing the middle and lower lobe bronchi



Figure 3 Cytological findings - tumour cells “naked nuclei” type with “salt and pepper” chromatin, with marked “crush” phenomenon, morphologically corresponding to small cell lung cancer cells

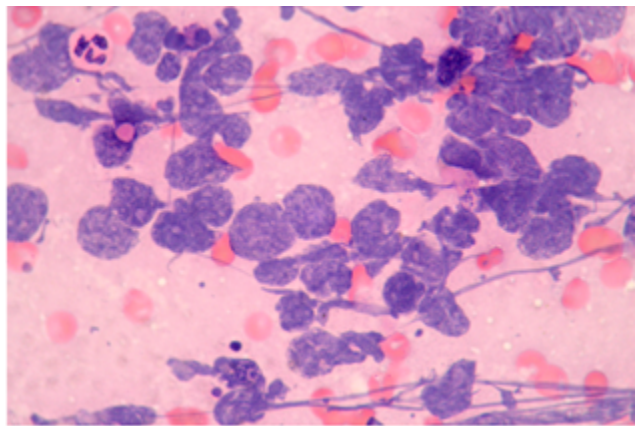


Figure 4 Cytological findings (identified by routine staining with hematoxylin and eosin, HE)

References

1. Travis WD, Brambilla E, Muller-Hermelink HK, Harris CC (2004) Pathology and genetics of tumours of the lung, pleura, thymus and heart.
2. Mareska M, Gutmann L (2004) Lambert-Eaton myasthenic syndrome. *Semin Neurol* 24: 149-153.
3. Senevirante U, De Silva R (1999) Lambert-Eaton myasthenic syndrome. *Postgrad Med J* 75: 516-520.
4. Verschuuren JJ, Wirtz PW, Titulaer MJ, Willems LN, van Gerven J (2006) Available treatment options for the management of Lambert-Eaton myasthenic syndrome. *Expert Opin Pharmacother* 7: 1323-1326.
5. Rees JH (2004) Paraneoplastic syndromes; when to suspect, how to confirm, and how to manage. *J Neurol Neurosurg Psychiatr* 75: ii43-50.
6. Honnorat J, Antoine J (2007) Paraneoplastic neurological syndromes. *Orphanet Journal of rare diseases* 2: 22.
7. Takamori M (2002) Lambert-Eaton myasthenic syndrome: search for alternative autoimmune targets and possible compensatory mechanisms based on presynaptic calcium homeostasis. *J Neuroimmunol* 15: 145-152; 201-202.
8. Takamori M, Maruta T, Komai K (2000) Lambert-Eaton myasthenic syndrome as an autoimmune calcium-channelopathy. *Neurosci Res* 36: 183-191.
9. O'Neill JH, Murray NM, Newson-Davis J (1988) The Lambert-Eaton myasthenic syndrome. *Brain* 111: 577-596.
10. Stickler DE, Sanders DB (2009) Lambert-Eaton myasthenic syndrome. *E Medicine* updated, <http://emedicine.medscape.com/article/1170810-overview>.
11. Newson-Davis J (2004) Lambert-Eaton myasthenic syndrome. *Rev Neurol (Par)* 160: 177-180.