

Diagnostic particularities and multimodal therapeutic and rehabilitation approaches to a complex case of post ischemic stroke with dysphagia and dysphonia, associating Millard-Gubler and Wallenberg syndromes- case report

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Abstract

Introduction. Millard-Gubler syndrome (MGS), also known as the ventral pontine syndrome or hemiplegic syndrome, is one of the classical crossed syndromes characterized by a unilateral lesion of the basal portion of the caudal part of the pons. MGS manifests as ipsilateral palsy of CN VI and VII with contralateral hemiplegia.

Wallenberg syndrome or lateral medullary syndrome, is characterized by the triad of Horner's syndrome, ipsilateral ataxia and contralateral hypoalgesia. Other clinical symptoms may include difficult swallowing, slurred speech, vertigo, nausea, vomiting, dyspnea, tachycardia, headaches and muscular hypertonia.

Materials and Methods

Having the patient's consent and The Teaching Emergency Hospital "Bagdasar-Arseni" Ethics Committee N.O 20270 from the 26th of June 2019, the current case report presents a 67-year-old male patient from rural area with left hemiplegia (complete brachial and crural motor deficit), right eye abduction paresis, dysphagia, dysphonia, central facial palsy - all post acute ischemic stroke. The patient was also diagnosed with ischemic cardiomyopathy, atherosclerosis, alcoholism, type 2 diabetes with Insulin therapy and oral antidiabetic agent. The patient was admitted in the Neurorehabilitation Clinic of the Teaching Emergency Hospital „Bagdasar-Arseni” (TEHBA) Bucharest, Romania, associating severe alteration in self-care abilities, locomotor dysfunction, memory disorders, slurred speech, for specialized rehabilitation treatment and nursing.

Results. A case of rare pathology for which, unfortunately, there is a discrepancy between functional improvement and the poor motor control in the in the lower limbs (muscle force was 0-1 out of 5 on the Medica Research Council scale), within an overall favorable evolution, including elements of the clinical status afferent to the two above mentioned syndromes.

Conclusions. Approaching such a clinical case has been a complex and extensive challenge for the entire neuromuscular recovery team and remains similar for any other squad. This pathology remains an issue that demands our earnest attention.

Key words: *Millard-Gubler syndrome (MGS), Wallenberg syndrome, crossed syndromes, hemiplegia, neurorehabilitation, stroke,*

Introduction

A characteristic of medullary lesions is the presence, in many instances, of a crossed sensory disturbance - pain and temperature sensation loss on one side of the body and on the opposite side of the face (1). Some example of these manifestations are presence in Lateral Medullary Syndrome (Wallenberg Syndrome) or Ventral Pontine Syndrome (Millard-Gubler Syndrome).

The World Health Organization (WHO) defines the stroke as: "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than vascular origin" (2,3).

Stroke are 80-85% ischemic (eg thromboembolic) and 10-15% haemorrhage. In general, the clinical evolution is favorable (in the most cases). The treatment includes anticoagulants and antiplatelets (3). The syndromes resulting after stroke are various and greatly depending on aetiology, severity, prognosis and recovery possibilities (4).

Wallenberg syndrome or lateral medullary syndrome was described first time in 1895. The syndrome is caused most often by atherothrombotic occlusion of the vertebral artery, followed less commonly by the posterior inferior cerebellar artery (PICA) (5). In clinical practice it is the most typical posterior circulation ischemic stroke syndrome (5,6). The typical patient is an elderly with vascular risk factors

and different combinations of deficits (5). The most common symptoms are the triad of Horner's syndrome, ipsilateral ataxia and contralateral hypoalgesia. Other clinical symptoms may include difficult swallowing, slurred speech, nausea, vomiting, dyspnea, tachycardia, headaches and muscular hypertonia, vestibular symptoms: vertigo and nystagmus and ipsilateral cerebellar signs (1,5,6). The diagnosis is suspected from anamnesis and clinical examination. To confirm the infarct in the lateral medulla or in the inferior cerebellar area the best diagnostic test to use is MRI with diffusion-weighted imaging (7). As a prognosis, the Wallenberg syndrome has a better functional outcome than most of the other stroke syndromes. Most patients can return to satisfactory daily basis activities (5).

Millard-Gubler syndrome (MGS), also known as the ventral pontine syndrome or hemiplegic syndrome, is one of the classical crossed syndromes characterized by a unilateral lesion of the basal portion of the caudal part of the pons. MGS manifests as ipsilateral palsy of CN VI and VII with contralateral hemiplegia (8). Motor deficits in strokes are common, being caused by lesions of the motor areas and pyramidal tract (*corticospinal tract* originate from *pyramidal* cells for MGS) (9). The diagnosis of MGS is confirmed by clinical examination, reinforced by neurological imaging (computed tomography and magnetic resonance imaging) for identifying the lesion. If the lesion is caused by an occlusion of the basilar artery, a vertebral angiography may be helpful to diagnose the syndrome (8). In some cases, the patient present multiple deficits that requires a multidisciplinary rehabilitation and early conservative measures. The prognosis depends on the etiology and the extent of the lesions (8,10).

Case report

The informed consent of the family and the approval no. 20270/26.06.2019 of the Bioethics Commission of „Bagdar-Arseni Hospital” in Bucharest were obtained for the communication of this case.

A 67-years-old male patient, from the rural area was admitted in our NeuroRehabilitation Clinic's Division on 9th of January 2019, with motor deficiency - left hemiplegia (complete brachial and crural motor deficit), swallowing disorders (dysphagia for solid and liquid), dysphonia, memory disorders, slurred speech, and severe self-care and locomotor dysfunction. In the personal pathological history, the patient had an acute

ischemic cerebrovascular accident on the 3rd of December 2018 (followed by aspiration pneumonia), and he is known with atherosclerosis, 3rd degree hypertension, ischemic cardiomyopathy, alcoholism, type 2 diabetes with Insulin therapy and oral antidiabetic agent. The history of the disease: the patient was admitted in December (2018) at The Neurosurgical Department of the National Institute of Neurology and Neurovascular Diseases where he was treated conservatively for right hemiplegic acute ischemic stroke treatment. Upon the discharge the following diagnostics were established: acute ischemic cerebrovascular accident of right pons region, Millard-Gubler syndroms, left hemiparesis, right abducens paresis, cerebral and systemic atherosclerosis, aspiration pneumonia (treated), dysphagia (Nasogastric tube). He was transferred to the Neurorehabilitation Clinic, Teaching Emergency Hospital “Bagdasar-Arseni” (TEHBA) for specialized recovery treatment.

At his admission the general state of the patient was stable, as the vital signs were normal: respiratory rate = 25 breaths per minute, SpO₂ (peripheral oxygen saturation) = 93%, blood pressure = 110/73 mm Hg, heart rate = 73 bpm. The physical examination revealed: slightly altered general condition, afebrile, overweight, the body mass index (BMI) = 28, postoperative left thigh scar (femoral diaphysis fracture in 1966 after road accident) and post-appendectomy scar, dry mucous membranes, hypotonic and hypokinetic muscular system, nasal feeding tube, large volume abdomen through the adipose tissue and reflex urination in adult diaper.

Regarding the neuro-mio-artro-kinetic (NMAK) examination, the patient was slightly temporo-spatial disoriented, *auto* and *allopsychically* without signs of meningeal irritation. The cranial nerves examination revealed dysphagia for liquid and solid (nasal feeding tube), dysphonia, slightly right peripheral facial paresis, right eye abduction paresis and no sensibility disorders. The deep tendon reflexes showed distinct value on different segments of the body: accentuated in the right superior limb, abolished in the right inferior limb, normal in the left superior limb and abolished in the left inferior limb. The Babinsky signs was indifferent in right inferior limb and slightly modified in left inferior limb.

The patient has no muscular strength and control on left hemibody. The muscle force on the Medical Research Council (MRC) Scale (11) in the right superior limb was 4 out of 5 on all levels. The muscle force in the right inferior limb was: proximal

(1/5 thigh flexion, 2/5 thigh extension), 2+/5 intermediar and distal 2-/5 dorsiflexion, plantar flexion 3/5, hallux dorsiflexion 3/5. Also, the patient was clinically and functionally assessed, according to the standardized protocols (grading scales/scores) implemented in our Clinic's Division: Functional Independence Measure (FIM) (12), Quality of Life Scale (QOL) (13), Functional Ambulation Category (FAC) (14), Montreal Cognitive Assessment (MoCA) (15), Mini-Mental State Examination (MMSE) (16), Modified Asworth Scale (17) and Penn Spam Frequency Scale (PSFS) (18), Glasgow Outcome Score Extended (GOS-E) (19), modified Rankin scale(mRS) (20), STRATIFY Scale for Identifying Fall Risk Factors (21).

Tabel 1- Scale Examination

	ADMISSION	DISCHARGE
Modified Rankin Scale	4	4
MOCA, MMSE	unable to test	Unable to test
STRATIFY Scale for Identifying Fall Risk Factors	0/5 (low risk)	0/5 (low risk)
FIM (Functional Independence Measure)– cognitive	21/35	21/35
FIM - motor	25/91	38/91
QoL (Quality of Life)	67/112	69/112
Modified Asworth and Penn Scales	0/4	0/4
FAC (Functional Ambulation Category)	0/5	0/5
GOS-E (The Glasgow Outcome Scale Extended)	3/8	3/8

The patient was paraclinically examined in order to evaluate his biological reserve and his availability in bearing the recovery program. To this purpose, both laboratory and imaging investigations have been used.

Tabel2- Laboratory Investigations

Test	Results 10.01	Results 29.01	Results 04.02	Laboratory range
Total proteins		5.9 g/dL	1.7 g/dL	6.4-8.2 g/dL
Albumin	2.9 g/dL	2.6 g/dL	3.8 g/dL	3.4-5 g/dL
VSH	10 mm/h	70 mm/h		3-8 mm/h
Fibrinogen		797.979 mg/dL		169-515 mg/dL
Hemoglobin	15.7 g/dL	12.6 g/dL		14-18 g/dL
Platelets	114 x10 ⁹ /uL	255 x10 ⁹ /uL		130-400x10 ⁹ /uL
Glycemia	65 mg/dL	122 mg/dL	213 mg/dL	74-106 mg/dL
CK-MB	30 U/L	16 U/L		7-25 U/L
Sodium	133 mmol/L		139 mmol/L	135-148 mmol/L
Potassium	3.06 mmol/L	3.38 mmol/L	3.62 mmol/L	3.5-5.3 mmol/L
Chloremia	95 mmol/L		104 mmol/L	96-107 mmol/L
Calcium	8.5 mg/dL	8.4 mg/dL		8.5-10.1 mg/dL
Magnesium	1.7 mg/dL	1.7 mg/dL	1.7 mg/dL	1.8-2.4 mg/dL
Iron	83 microg/dL	117 microg/dL	107 microg/dL	65-165 microg/dL
LDH	234 U/L		219 U/L	85-227 U/L
HDL-Cholesterol	41 mg/dL	18 mg/dL	21 mg/dL	40-60 mg/dL
LDL-Cholesterol	65.4 mg/dL		56.8 mg/dL	150-190 mg/dL
Bronchial aspiration	No pathogen germs identified			
Urine test	normal	Proteins - 3+; Erythrocytes - 3+; Leucocytes - 500/microl; frequent germs		
Urethral secretion test		Klebsiella pneumoniae		
Urine culture test		Klebsiella sp		

Relevant for the diagnosis and case evolution are the following imagistic investigations results:
 Pulmonary x-ray (1) : infra-hilar alveolo-interstitial infiltration situated in the left lung;
 supradiaphragmatic left pulmonary opacity determining the retraction of the pleura with fibrotic component.



Fig1 - 10.01.2019- x – ray from the files of “Bagdasar-Arseni” Hospital

Pulmonary x-ray (2): absence of acute pleuropulmonary lesions



Fig2 - 22.01.2019- x – ray from the files of “Bagdasar-Arseni” Hospital

Angio Cerebral IRM: absence of hemorrhagic cerebral lesions; micro lacunar bulbopontine lesions on different stages of evolution, chronic demyelination lesions in the white bifrontal matter, cortical diffuse atrophy, absence of thrombosis of the anterior and posterior cerebral arteries.

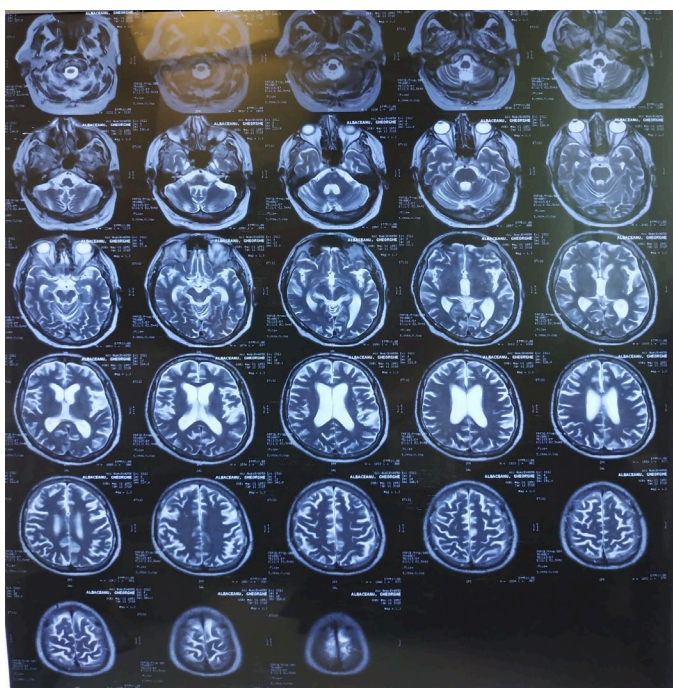


Fig3-11.01.2019- angio cerebral IRM from the files of "Bagdasar-Arseni" Hospital

Based on the patients' background, the clinical and para-clinical parameters taken into consideration, the admission and the 72 hours diagnosis were established: Left Hemiplegia with complete (brachial and crural) motor deficits, right eye abduction paresis, slightly right peripheral facial paresis, dysphagia for liquid and solid (nasal feeding tube), dysphonia, Millard-Gluber and Wallenberg syndrome and severe self-care and locomotor dysfunction - all post acute ischemic stroke (03.12.2018). Chronic ischemic cardiomyopathy. Systemic atherosclerosis. Alcoholism. Type 2 diabetes with Insulin therapy and OADs. Moderate hypoalbuminemia and hypokalemia. Mild hypochloroemia, cytolysis syndromes, hyponatremia, thrombocytopenia, inflammatory syndrome.

Evolution

During the hospital stay, the patient underwent a complex recovery program which included pharmaceutical treatment with injectable anticoagulant type HGMM, anti-platelet aggregation, neurotrophic, gastric protector (IPP and H2 receptor inhibitor), statine, antianginos drug, beta-blocker, ADOs and Insulin, vitamin supplements, hydric and electrolytic reequilibration with KCl and NaCl 0.9%, loop diuretic, antibiotics, anxiolytic, urinary antiseptics, expectorants/

mucolytics, physical treatment (kinesiotherapy), speech therapy evaluation and aerosol therapy.

The main objectives of the rehabilitation program individualized for this patient were to prevent short-term complications (thrombophlebitis, bedsores, respiratory complications, urinary infections), depression and regain functionality in order to improve patient's quality of life (22,23,24).

The recovery team collaborated with other specialists to provide the patient a complete, individualized recovery plan, based on the particularities of the case.

A cardiologic consult was performed, and the specialist recommended double anti-platelet aggregation, statine and clinical reevaluation when needed. The thoracic surgery consult objectified a rare and inefficient cough and bilateral rales for which were recommended respiratory physiotherapy, aerosols, taping, assisted cough, proper hydration and mucolytics.

In order to evaluate the possibility of replacing the nasogastric tube with percutaneous gastrostoma (PEG), we performed an gastroenterology consult, an upper gastrointestinal endoscopy and an abdominal ultrasound. As the endoscopic aspect showed a haemorrhagic gastritis, the PEG is postponed for 5-7 days and pharmaceutical treatment with *proton-pump inhibitors* (PPIs) was recommended. After six days, the nasogastric tube was replaced with PEG.

In evolution, the patient presented urinary tract infection (UTI) with *Klebsiella* spp. The urethral secretion cultures revealed infection with *Klebsiella* pneumonia that was treated according to the antibiogram.

After five days from the PEG intervention, the general surgery consult showed a fetid odor and an erythematous area around the gastrostoma for which were recommended local toilet and treatment with silver sulfadiazine, daily dressing and antibiotic therapy, followed by repositioning of the gastrostomy tube to the abdominal wall. The last endoscopic control showed a good functioning and good digestive tolerance of the PEG.

At the general *medical reexamination*, *abnormal* respiratory sounds (crackles) were objectified, for which an wide-spectrum antibiotic was recommended.

In order to manage anxiety and episodes of reactive depression, psychiatric consultation was performed.

The kinesiotherapy program in the first two weeks consisted of passive movements of upper and lower

limb performed at the patient's bed by the physiotherapist, followed by exercises in gym, such as motomed, squat, foot pedal exercises, exercises with the gym stick and for walking re-education; muscle strength training: pedal with wheels; breaking the gait cycle down into smaller more manageable chunks and repeating movement to stimulate nerve pathways; unilateral support on parallel bars; stretching to increase range of movement.

After the kinesiotherapy program, the patient was able to tolerate the position in the wheelchair for about 1-1.5 hours. Also, the patient has an overall increased endurance in his respiratory capacity, but cannot perform the transfer alone. The patient had slight progress in terms of muscle strength: with bilateral support- one-sided force support on the parallel bar / tetrapod and slightly-moderate support from the kinesiotherapist-, the patient manages to walk approximately 10 m.

Results

A case of rare pathology for which, unfortunately, there is a discrepancy between the functional improvement in the lower train, which is relatively important for the short-term hospitalization (only 42 days), in relation with the poor motor control in the lower limbs (muscle force was 0-1 out of 5 on the Medica Research Council scale). It is worth mentioning an overall favorable evolution, including elements of the clinical status afferent to the two above mentioned syndromes.

Prognosis

The patient's prognosis is reserved due to multiple comorbidities (*hypertension* stage 3, ischemic heart disease, atherosclerosis, diabetes), with the risk of recurrence at any time (*ad vitam* and *ad functionem* – reserved). *Ad laborem* is not necessary to be evaluated.

Reccomandations

Upon discharge, it is recommended that the patient continues the rehabilitative treatment (according to the instructions given - drugs and kinesiotherapy program) at home or at another neurorecovery unit and, a regular check-up at our clinic.

Conclusions

Approaching such a clinical case has been a complex and extensive challenge for the entire neuromuscular recovery team and remains similar for any other squad. This pathology remains an issue that demands our earnest attention.

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