

Patient with syncope

Vladimir Mitov¹, Aleksandar Jolić¹, Milan A. Nedeljković², Nebojša Mujović²,
Dragana Adamović¹, Marko Dimitrijević¹, Milan Nikolić¹

¹Department of Interventional Cardiology, Medical Center Zaječar, ²Clinic of Cardiology, Clinical Center of Serbia, Belgrade

Abstract

Male patient, 60 years old, is referred for the first time to Pacemaker Center Zaječar on 26th of July 2018. for assessment of possible indication for pacemaker implantation. After initial evaluation (History, Clinical exam and ECG) with normal findings patient had Additional evaluation for syncope. He has done a three 24-hour Holter recordings with no significant disturbances in excitability or conductivity. Sinus bradycardia was found during sleep. During the day hours, a chronotropic competence is maintained. Exercise test that he has also done is described as negative for ischemic disease, with preserved chronotropic competence. Echocardiography described like normal finding. Neurological exams: clinical finding is normal. MRI of the head was done, also with normal findings. The patient was implanted with implantable loop recorder in left pectoral region, the device was Medtronic Reveal LinQ. During regular device electronic check up we found a several pauses detection of which the longest was 45s in duration. Based on these recordings, an indication for pacemaker implantation was made. Conclusions: Cardiac syncope represents a clinical and diagnostic challenge. An implantable loop recorder is an adequate diagnostic tool for cardiac syncope detection in patients with syncope of unknown origin. Pacemaker implantation is a permanent solution for treatment of cardiac syncope caused by bradyarrhythmia events.

Key words

Syncope, Loop recorder, Pacemaker.

Introduction

A syncope is a syndrome which is defined as a sudden, transient loss of consciousness with inability to maintain postural tone, provoked by impaired brain perfusion. The event is short with complete and spontaneous recovery.

Pre-syncope is comprised of symptoms which precede the syncope. Usually they are vertigo or visual sensation like "tunnel vision" or different levels of consciousness alterations but without complete loss of it. Pre-syncope can progress to syncope or end without becoming one.

Unexplained syncope is the latter that can remain without cause relation, even after the initial patient evaluation (medical history, physical exam, ECG).

Clinical forms of syncope:

Orthostatic intolerance which can be accompanied or not, by tachycardia or hypotension (classical, neurogenic, or delayed).

Cardiogenic syncope envelops:

- Arrhythmias as a cause of syncope: bradycardia (sick sinus syndrome, AV disease), tachycardia (supraventricular, ventricular),
- Structural diseases: aortic stenosis, acute coronary syndrome, hypertrophic cardiomyopathy, pericar-

dial diseases-tamponade, congenital heart disease, artificial heart valves, tumors of the heart, pulmonary embolism, pulmonary hypertension, aortic dissection.

Reflex syncope is caused by reflex vasodilation, bradycardia or both. These can be vasovagal (orthostatic, emotional), situational (urinary, gastrointestinal stimulation, after strenuous exertion, cough related, laughter related) and carotid sinus syndrome.

High probability of cardiac cause of syncope is in: 60 years of age and older, male sex, exertion syncope, or in supine position, short prodromes (palpitations), but also a sudden loss of consciousness without prodromes, smaller number of events e.g. one or two. These patients usually have an abnormal clinical finding on the heart, joined with structural heart disease, ischemic disease, already diagnosed arrhythmias, reduced ejection fraction, and congenital heart disease.

Initial tests include medical history, physical exam and ECG (Graph 1.)

In case that the cause is not diagnosed, further diagnostic examination with the whole array of non-invasive tests is needed, along with multidisciplinary approach (Graph 2).

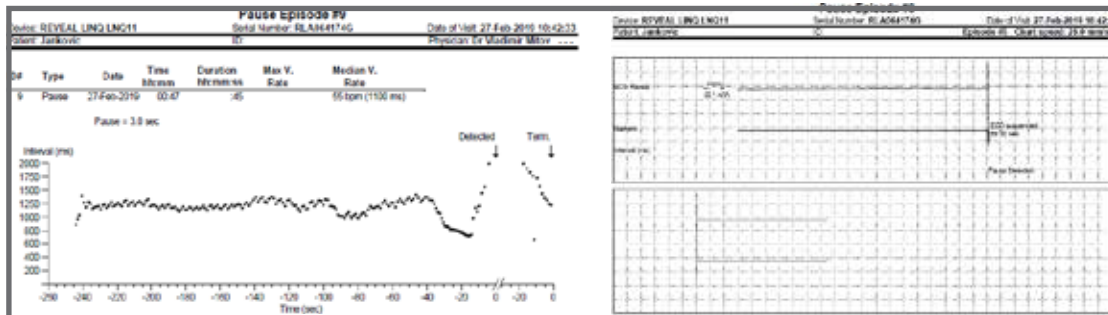


Figure 1. The longest asystole episode which was not accompanied by syncope because it occurred during sleep (picture 2)

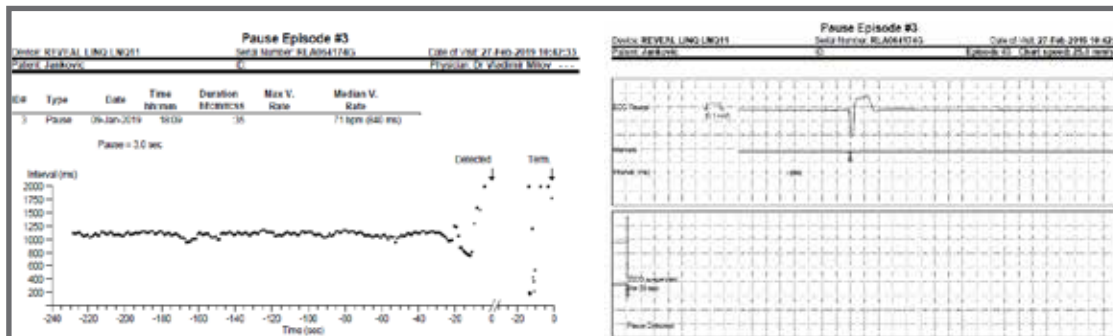


Figure 2. Asystole episode that happened when patient was awake and was followed by syncope.

had an occurrence rate of only 3 times in a year. All of the above characteristic pointed out high probability of cardiac syncope, which in turn led to indication for implantable loop recorder implantation. Loop recorder is an invasive ECG monitoring device enabling ECG event recording during the period of 2-3 years and is a method of choice for patients with low event rates, where all other methods failed in determining the cause of syncope. Loop recorder was useful for detecting ECG changes in 176 (35%) from 506 patients with unexplained syncope, 56% had asystole or bradycardia, 11% had tachycardia and 33% had no arrhythmia⁸. The main ECG diagnosis of arrhythmic syncope are prolonged asystole (>3 sec), rapid supraventricular tachycardias (>160 beats/min for >32 beats) or ventricular tachycardia². In the ISSUE-3 trial with Implantable loop recorder indication for DDD pacemaker implantation was syncope with asystole over 3 sec, or asystole over 6 sec without syncope (9). Pacemaker implantation represents an etiology related and most adequate treatment in patients with syncope caused by bradyarrhythmia events⁷.

Conclusions

Cardiac syncope represents a clinical and diagnostic challenge. An implantable loop recorder is an adequate diagnostic tool for cardiac syncope detection in patients with syncope of unknown origin. Pacemaker implantation is a permanent solution for treatment of cardiac syncope caused by bradyarrhythmia events.

Literature

- Shen WK, Sheldon RS, Benditt DG, et al. 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope. *JACC* 2017;70; e39-110.
- Brignole M., Moya A., de Lange FJ., et al. 2018 ESC Guidelines for the diagnosis and management of syncope. *European Heart Journal* 2018;39;1883-1948.
- Chen LY, Shen WK, Mahoney DW, et al. Prevalence of syncope in a population aged more than 45 years. *Am J Med.* 2006;119:e1-7.
- Ruwald MH, Hansen ML, Lamberts M, et al. Accuracy of the ICD-10 discharge diagnosis for syncope. *Europace.* 2013;15:595-600.
- Sun BC, Emond JA, Camargo CA Jr. Characteristics and admission patterns of patients presenting with syncope to U.S. emergency departments, 1992-2000. *Acad Emerg Med.* 2004;11:1029-34.
- Soteriades ES, Evans JC, Larson MG, et al. Incidence and prognosis of syncope. *N Engl J Med.* 2002; 347:878-85.
- Kusumoto FM, Schoenfeld MH, Barrett C, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay. *Journal of the American College of Cardiology* (2018), doi: <https://doi.org/10.1016/j.jacc.2018.10.044>.
- Brignole M, Vardas P, Hoffman E, et al. EHRA Scientific Documents Committee. Indications for the use of diagnostic implantable and external ECG loop recorders. *Europace* 2009;11:671-687.
- Brignole M, Menozzi C, Moya A, et al, International Study on Syncope of Uncertain Etiology 3 (ISSUE-3) Investigators. Pacemaker therapy in patients with neurally mediated syncope and documented asystole: Third International Study on Syncope of Uncertain Etiology (ISSUE-3): a randomized trial. *Circulation* 2012;125:2566-2571.

Sažetak

Sinkope

Vladimir Mitov¹, Aleksandar Jolić¹, Milan A Nedeljković², Nebojša Mujović², Dragana Adamović¹, Marko Dimitrijević¹, Milan Nikolić¹

¹Odeljenje Invazivne kardiologije ZC Zaječar, ²Klinika za kardiologiju KC Srbije

Pacijent M.J. muškog pola 60 godina prvi put se javlja u Pejsmejker centar u Zaječaru 26.07.2018. zbog procene indikacije za implantaciju antibradikardnog pejsmejker. Nakon inicijalne evaluacije (istorija bolesti, klinički nalaz, EKG) sa normalnim nalazima pacijentu su sprovedena dodatna klinička ispitivanja.

Donosi sa sobom tri 24h Holtera EKG: bez značajnih poremećaja u razdražljivosti i sprovodljivosti, sa sinusnom bradikardijom u toku sna, u toku dana adekvatne hronotropne kompetentnosti. Ergo test je opisan kao negativan na značajnu ishemiju, sa očuvanom hronotropnom kompetencijom. Eho srca je procenjen kao normalan. Neurološki nalaz u granicama normale, urađena NMR endokranijuma sa opisanim normalnim nalazom. Pacijentu je injektiran u levu prepektoralnu regiju Loop recorder Reweal Linq. Pacijent se javlja na redovni pregled Loop recordera kada su detektovane pause od kojih je najduža bila 45 sekundi. Na osnovu nalaza Loop rekordera indikovana je implantacija DDDR pejsmejker.

Zaključak: Kardijalne sinkope predstavljaju veliki klinički i dijagnostički izazov. Loop recorder je adekvatno dijagnostičko sredstvo za identifikaciju kardijalnih sinkopa kod pacijenata sa sinkopama nepoznatog uzroka. Implantacija antibradikardnih pejsmejker predstavlja trajno rešenje kardijalnih sinkopa koje su izazvane bradiaritmijama.

Ključne reči: Sinkopa, Loop rekorder, Pejsmejker