SERBIAN ARCHIVES OF MEDICINE Est.1872

Address: 1 Kraljice Natalije Street, 11000 Belgrade, Serbia
☏ +381 11 4092 776, Fax: +381 11 3348 653
E-mail: srparhiv@bvcom.net, Web address: www.srpskiarhiv.rs

Paper Accepted* **ISSN Online 2406-0895**

History of Medicine / Историја медицине

Siniša U. Pavlović[1,2,†]

Dragoljub-Bata Adamov (1927–1996) – First pacemaker implantation in Serbia in year 1965

Драгољуб-Бата Адамов (1927–1996) – прва уградња пејсмејкера 1965. године у Србији

[1] Clinical Center of Serbia, Pacemaker center, Belgrade, Serbia;
[2] University of Belgrade, School of Medicine, Belgrade, Serbia

Received: November 22, 2016
Accepted: March 21, 2017
Online First: March 31, 2017
DOI: 10.2298/SARH171122098P

† **Correspondence to:**
Siniša U. PAVLOVIĆ
Pacemaker center, Koste Todorovića 8, 11000 Belgrade, Serbia
E-mail: **pavlosini@yahoo.com**

Dragoljub-Bata Adamov (1927–1996) – First pacemaker implantation in Serbia in year 1965

Драгољуб-Бата Адамов (1927–1996) – прва уградња пејсмејкера 1965. године у Србији

SUMMARY

It has been over half a century of when implementation of pacemaker therapy starts in our country and in the region. First successful implantation of a pacemaker in former Yugoslavia, and in Serbia took place on 16 September 1965 in KBC "Dr Dragisa Mišović", and that operation, with a team of doctors of the institution, committed by surgeon Dragoljub Bata Adamov (1927–1996). First permanent pacemaker implantation was with epicardial leads with thoracotomy approach. The patient was operated under general anesthesia, which gave by anesthesiologist Predrag Lalević (1927–), and in addition to the doctor Adamov, as assistants stated Dr. Miša Albreht (1933-) and Dr. Milan Dragović (1933–2009).

Taking into account the fact that the pacemaker therapy confirmed and proved, it is necessary to recall the pioneers applying this kind of therapy in this region and the memory of it to pay in all deserved recognition.

Keywords: Pacemaker, first implantation, history of medicine

САЖЕТАК

Протекло је преко пола века од почетака примене пејсмејкер терапије у нашој земљи. Прва, успешна уградња пејсмејкера у бившој југославији, па тиме и у Србији је учињена 16. септембра 1965 у болници „Др Драгиша Мишовић“ у Београду, а операцију је, заједно са тимом лекара ове болнице извршио хирург, примаријус др Драгољуб-Бата Адамов (1927–1996). Прва уградња пејсмејкера је учињена приступом торакотомијом са применом епикардијалних електрода. ПАцијент је оперисан у условима опште анестезије коју је водио анестезиолог др Предраг Лалевић (1927–), а асистирали су др Миша Албрехт (1933–) и Др Милан Драговић (1933–2009).

Примена пејсмејкер терапије касније је широко примењивана, али неопходно је подсетити на пионире примене ове врсте терапије у овом региону, јер су они својим местом у историји српске медицине такву пажњу засигурно и заслужили.

Кључне речи: Пејсмејкер, прва уградња, историја медицине

INTRODUCTION

It has been over half a century of when implementation of pacemaker therapy starts in our country and in the region. Today, in this area, the National Reference Center, Pacemaker Center "Prof. Dr. Milan-Bane Djordjevic" Clinical Center of Serbia represent the highest level of application of this type of therapy. Pacemaker Center Clinical Center of Serbia bears the name of Professor Milan-Bane Djordjevic (1933-1993), founder of this center who established the standards for the use of pacemaker therapy and have done a lot in its development and implementation. [1].

Figure 1. Dragoljub-Bata Adamov (1927–1996).

However, it should be emphasized that the first successful implantation of a pacemaker in former Yugoslavia, and in Serbia took place on 16 September 1965 in KBC "Dr Dragisa Mišović", and that operation, with a team of doctors of the institution, committed by surgeon Dragoljub Bata Adamov (1927–1996) (Figure 1).

In those years in Novi Sad doctor Ivan Fajgelj (1919-2002) tried to save a patient with complete AV block connecting the electrode attached to the heart muscle with the power source of low voltage, a switch triggering represented ordinary musical metronome. Unfortunately, this endeavor there were no precise data, if for no other reason, at least as an illustration of doctoral inventiveness in problem solving life-threatening bradycardia.

Getting back to the first pacemaker implantation by recalling the parts of doctor Adamov biography.

Dragoljub Adamov was born in Kikinda, where he finished elementary school and began high school. In his fourteenth year accompanied with his father, Rada, professor of Kragujevac High School, was arrested by Nedic police and brought to the Topovske šupe (name meens Cannon sheds) in Kragujevac 21 October 1941. Total hostages who were arrested have been around 6000. Shooting hostages on October 21 began in the morning at seven o'clock. The German soldiers were executed in 2301 a person, as a reprisal for the 10 dead and 26 wounded German soldiers. Immediately afterwards he executed another 500, because in the confusion of the people who were taken away to be shot dead five other German soldiers. Two hundred and fifty hostages were left in reserve for the execution, if there are some riots in the city, and two hundred is reluctant to bury shooting [2]. Among others, who were released, just by chance were professor Rada Adamov and his son Dragoljub. It should be noted that Dragoljub parents, Nadežda and Rada, were professors of history and geography in Kragujevac High School at the time of this event.

After the war began the study of medicine, which ends in 1952 at the Medical Faculty in Belgrade. As a student he was interested and began to work on endoscopic procedures at the Military Medical Academy. He specialized surgery in Belgrade, and then he started working at the hospital in the Bežanijska Kosa, as well as thoracic surgeons.

Then goes on training and one year stay in the United States with Dr. Paul Sanger (Paul W. Sanger 1907-1968) (Charlotte, North Carolina) in the hospital, which now bears the name of dr Sanger (sanger Heart and Vascular Institute). After a stay at the doctor Sanger, with whom remains and personal friend, goes to professional training in the Karolinska hospital and work with Dr. Bjork (Viking Bjork 1918-2009), and then with doctor Libor Hejhal in Prague (Libor Hejhal 1924-1979), where studied in the field of vascular surgery[3]. During his stay at the Karolinska hospital he had the opportunity to get acquainted with the concept of implantation of whole pacemaker in the human body. In this hospital in the year 1958. Dr. Ake Senning (Åke Senning 1915-2000) successfully implanted first pacemaker to patient Arne Larson (Arne H. W. Larsson 1915-2001). Pacemaker was designed by engineer Rune Elmkvist (Rune Elmquist 1906-1996) [4].

After returning from professional surgcal training doctor Adamov goes to the hospital, "Dr Dragisa Mišović" in Belgrade. Hospital "Dr Dragisa Mišović" was founded in 1952 and had the department of general surgery, but is very fast so designed surgery began to allocate specific groups of pathological conditions, which dictated the further development of vascular, pulmonary and cardiac

surgery (for the first time made application hypothermia). It is the dominant motif for young surgeons to continue improving exactly of these areas [5]. The first complex cardiovascular surgery at this hospital performed Ivo Popovic-Đani (1915-1986), and Dragoljub-Bata Adamov[5].

In his later career, Dr. Adamov has made great efforts to define and establish the Department of Thoracic and Vascular Surgery, as the first independent Center for Vascular Surgery in our country, which has been realized in 1970. The first few years, this department headed by Dr. Adamov has primacy in Cardiac Pacing, but Dr. Adamov focuses its interest in the problems of vascular surgery, and making great efforts in the allocation of special hospital for vascular surgery and training of staff. In the seventies begins and ends with the construction of a new hospital building in Dedinje, which started working in October 1977 under the name of Department of Cardiovascular Surgery (today Institute for Cardiovascular diseases, Dedinje). Its first director was doctor Adamov. Department of vascular surgery leading by primarius Miodrag Jevremović, and service of cardiac surgery professor Mihajlo Vucinic (1932-2004) [5].

In 1986, doctor Adamov's illness went him into early retirement and 1996 dies.

FIRST PACEMAKER IMPLANTATION

Figure 2. Doctor Adamov in the operating room during surgery.

In 1965, Dr. Adamov implanted the first permanent pacemaker with epicardial leads with thoracotomy approach (Figure 2).

This first implantation occurred on 16 September 1965 (protocol number of the hospital in 1281, and the sequence number in the protocol operations was 1002) (Figure 3). The patient was operated under general anesthesia, which gave by anesthesiologist Predrag Lalević (1927–), and in addition to the doctor Adamov, as assistants stated Dr. Albrecht (Albreht Miša, 1933–) and Dr. Dragovic (Milan Dragovic 1933–2009). Scrub nurse was Nada. Patient K.D., born 1904, was operated due to complete heart block.

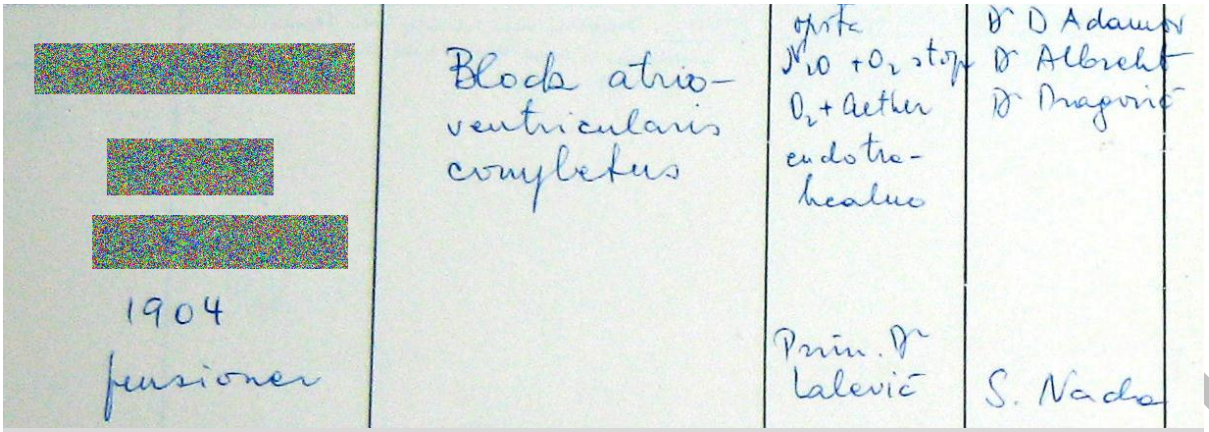

Figure 3. Part of the hospital protocol with the above diagnosis of the patient and the team that took part in the first intervention of pacemaker implantation.

The protocol is a description of the entire procedure, so it is written the following (copy written into the protocol) (Figure 4):

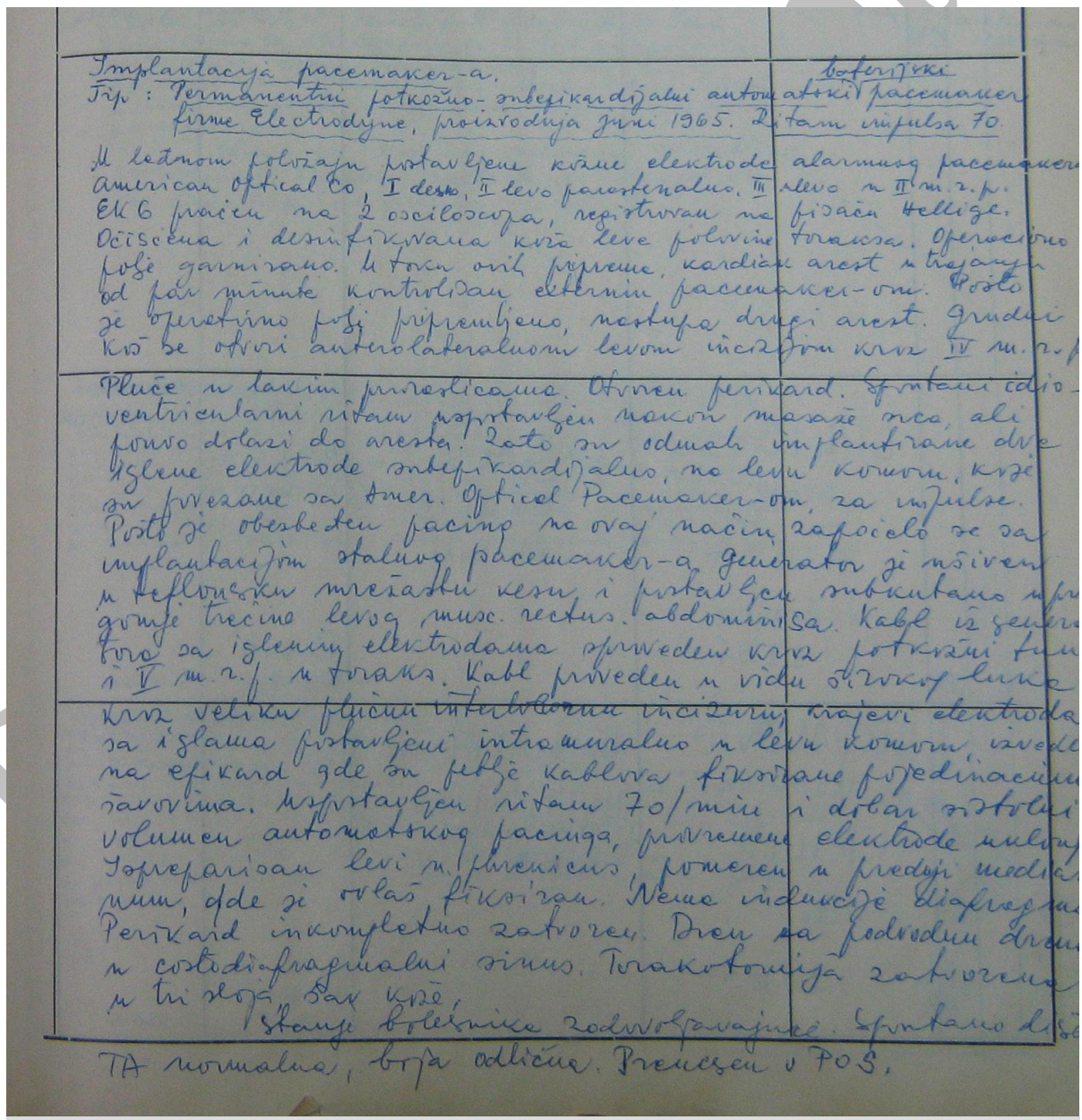

Figure 4. Page of the original protocol with a description the entire procedure of first pacemaker implantation.

"Implantation of a pacemaker

Type: Permanent subcutaneous subepicardial automatically pacemaker-battery, made by company Electrodyne[*]*, production June 1965. The rhythm pulses 70BPM.*

In the position on the back set of skin electrodes alarm pacemaker American Optical Co.[†]*, and to the right, left parasternal II, III left in the second i.c.s. (intercostal space - author's note).*

ECG followed by the two oscilloscopes, registered in the printer Hellige. Skin of the left half of the thorax cleaned and disinfected. Operative area garnished.

During these preparations cardiac arrest for a period of a few minutes controlled by an external pacemaker. Since the operative field prepared comes the second arrest. The chest is opened by anterolateral incision in the fourth i.c.s. (intercostal space). Lungs in light adhesions. Open the pericardium. Spontaneously idioventricular rhythm is established after cardiac massage, but again comes to the arrest. So we immediately placed two needle electrodes subepicardial, the left ventricle connected with Amer.Optical external pacemaker. Having secured pacing in this way, we started with the implantation of a permanent pacemaker. Generator is sewn into a teflon mesh bag and placed subcutaneously in the upper third of the left musculus rectus abdominals. The cable from the generator with a needle electrode administered through a subcutaneous tunnel and in the intercostal space in the thorax. Cable implemented in the form of a wide arc through the large pulmonary interlobarni posterior, the ends of the electrodes with needles placed intramural into the left ventricle, sewn on the epicardium where the loop cables fixed sutures. Established automatic pacing rhythm of 70 BPM. and good systolic volume, temporary electrodes removed. Preparation of left n.phrenicus, and its been moved in front mediastinum where lightly fixed. No induction of phrenic nerve stimulation and diaphragm stimulation. Pericardium incompletely closed. Underwater drainage in the costo-diaphragmal sinus. Thoracotomy closed in three layers, suture the skin.

Condition of patients is satisfactory. Spontaneous breathing, TA normal, excellent color, transferred to the ICU."

The operation was successful, and patient survived for a next few years without significant complications and disorders, but according to Professor Lalovic, the whole story had a tragic outcome: patient committed suicide, afraid that because of the pacemaker will not be able to die[10]. The documents to confirm such an outcome does not exist, but this is what the doctor Adamov said in a conversation with professor Lalević about the sad fate of the first patient with an implanted pacemaker in the history of Serbian medicine.

[*] Pacemaker company Elctrodyne from the US was producing pacemakers these years, that would then be sold to Becton Dickinson Company, which in 1971 turned out pacemaker production.

[†] American Optical Company (AO) from Southbidge (Massachusetts, USA), was founded in the nineteenth century, and since the 60s of the twentieth century begins to products and equipment related to cardiology, which is linked to the arrival in the company engineer Berković (Barouh Vojtec Berkovits, 1926-2012). He constructs defibrillator and first pacemaker "on demand", which is not enough commercial success in the beginning.

CONCLUSION

Dr. Adamov has left a large and significant trace in surgery in general, and will be remembered as a pioneer and the first doctor who implanted a permanent pacemaker not only in Serbia, but also in this part of Europe. Thus began the era of application of pacing in our country.

Taking into account the fact that the pacemaker therapy confirmed and proved, it is necessary to recall the pioneers applying this kind of therapy in this region and the memory of it to pay in all deserved recognition. The desire and intention of the author of this review was to remind all of us to it.

ACKNOWLEDGEMENTS

Special thanks go to professor Dragan-Gaga Radovanovic, surgeon Clinic of Surgery KBC "Dr Dragisa Mišović" to help find protocol operations and photos page protocol.

Special thanks, also to professor Aleksandar Neskovic and family of Mr. Josip Klinger from Zurich, especially his daughter Vesna, to help locate and establish contact with the family Adamov, Mr. Rade, son of doctor Bata Adamov, and Rade′s wife Bogdanka, to whom I owe a special thanks to understand my desire to be all together in recall of the indelible mark that is in the application of this type of therapy left by doctor Dragoljub-Bata Adamov.

Information about attempting to create a pacemaker in Novi Sad with the help of a metronome by the idea of doctor Ivana Fajgelj is derived from personal contact with Dr. Josip Lavac, whose father brought a technical solution for this attempt to save life of the patient.

I express gratitude to professor Predrag Lalevic, who is a witness of the first implantation of the pacemaker and who shared his memories with us.

REFERENCES

1. Pavlović S: Naučno delo profesora Milana-Baneta Đorđevića (1933-1993). Srp Arh Celok Lek. 2002; 130 Suppl 4: 29–48.
2. Izveštaj kapetana Bišofshausena od 20. X 1941 god. o masovnom streljanju u Kragujevcu, Zbornik dokumenata vojnoistorijskog instituta: tom I, Borbe u Srbiji. Knjiga 1. Dokument 226.
3. Čolović RB. Hronika hirurgije u Srbiji. Beograd: Prosveta; 2002.
4. Furman S. The fiftieth anniversary of cardiac pacing. Pacing Clin Electrophysiol. 2002; 25(5): 751–2.
5. Huskić R. Institut za kardiovaskularne bolesti "Dedinje". In: u knjizi. Čolović RB. Hronika hirurgije u Srbiji. Beograd: Prosveta; 2002. p. 532.

