



The Importance of Addressing Atrial Fibrillation During Concomitant Cardiac Surgery

Ahmet Zengin¹, Taylan Adademir¹, Kaan Kırallı¹

¹ University of Health Sciences, Istanbul Kartal Kosuyolu High Speciality Training and Research Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey

ABSTRACT

A long-term maintenance of sinus rhythm in patients undergoing cardiac surgery with atrial fibrillation is only possible with concomitant Cox-Maze IV procedure. Contemporary studies suggest that concomitant atrial lesion sets produce long-term sinus conversion rates of up to 90%. This procedure holds the potential to improve life quality and even survival of the patients; however, many surgeons are reluctant to perform the same. More than half of the patients with atrial fibrillation undergoing cardiac surgery for different reasons never receive any kind of intervention for atrial fibrillation, which means missing a once-in-a-lifetime opportunity to treat atrial fibrillation. Rate control with anticoagulation remains the only alternative treatment for these patients. Anticoagulation can be a relatively safe option at the time of surgery but may become dangerous or even a contraindication with the patient's increasing age and a possible development of new diseases. Sinus rhythm can become lifesaving at that point. The objective of this report is to describe a successful surgical treatment of a 74-year-old woman with severe mitral and tricuspid valve insufficiency along with atrial fibrillation. She had mild leucopenia and anemia at the time of surgery without any hematological diagnosis. She was diagnosed with myelodysplastic syndrome six months after the surgery. In addition to valve repairs, the maintenance of sinus rhythm prompted hematologists to treat her without using any anticoagulation medicines. We believe that atrial fibrillation should be addressed during cardiac surgery because the maintenance of sinus rhythm might become crucial during follow-up!

Key Words: Cox maze IV; myelodysplastic syndrome

Kalp Cerrahisi Sırasında Eşlik Eden Atriyal Fibrilasyonun Hedef Alınmasının Önemi

ÖZET

Kalp operasyonu geçirecek olan atriyal fibrilasyonlu hastalarda uzun süreli sinüs ritminin korunması sadece eşlik eden Cox Maze IV operasyonu ile mümkündür. Güncel çalışmalar, eş zamanlı bi-atriyal lezyon setleri yapılan hastalarda %90'a kadar uzun süreli sinüs ritmi sağlandığını göstermektedir. Bunun yaşam kalitesini artırma ve hatta hastaların yaşam sürelerini uzatma potansiyeli vardır; ancak birçok cerrah bu prosedürü uygulama konusunda isteksizdir. Farklı nedenlerle kalp cerrahisi geçiren atriyal fibrilasyon hastalarının yarısından fazlasında atriyal fibrilasyon için herhangi bir müdahale yapılmaz. Bu, atriyal fibrilasyonu tedavi etmek için tek fırsatı kullanmamak anlamına gelir. Antikoagülan ilaçlar ve hız kontrolü, bu hastalar için kalan tek tedavi yöntemidir. Antikoagülasyon, ameliyat döneminde nispeten güvenli bir seçenek olabilir, ancak hastanın artan yaşı ve gelişebilecek yeni hastalıkları ile tehlikeli veya hatta kontrendike olabilir. Sinüs ritmi bu noktada hayat kurtarıcı olabilir. Burada ciddi mitral, triküspit kapak yetmezliği ve atriyal fibrilasyonu olan 74 yaşında bir kadın hastanın başarılı cerrahi tedavisi sunulmaktadır. Ameliyat sırasında hematolojik tanısı olmayan hastada, hafif lökopeni ve anemi mevcuttu. Hastaya ameliyattan altı ay sonra miyelodisplastik sendrom tanısı konuldu. Kapak onarımına ek olarak, sinüs ritminin sağlanması, hematologların tedavisini antikoagülasyonsuz yapabilmesini sağladı. Atriyal fibrilasyonun kardiyak cerrahi sırasında düzeltilmesi gerektiğine inanıyoruz, çünkü sinüs ritminin devamı zamanla daha da önemli olabilir.

Anahtar Kelimeler: Cox Maze IV; miyelodisplastik sendrom

INTRODUCTION

Myelodysplastic syndrome (MDS) is a hematopoietic system disorder accompanied by ineffective hematopoiesis and cellular dysfunction. Anemia, leukopenia, and thrombocytopenia are some laboratory findings in this patient group, and the clinical manifestation is established according to these findings⁽¹⁾. The main problem in patients with MDS who underwent open heart surgery is infection and bleeding in a short term⁽²⁾. A long-term use

Cite this article as: Zengin A, Adademir T, Kırallı K. The importance of addressing atrial fibrillation during concomitant cardiac surgery. Koşuyolu Heart J 2020;23(2):141-3.

Correspondence

Ahmet Zengin

E-mail: dr.zenginahmet@gmail.com

Submitted: 27.06.2020

Accepted: 21.07.2020

Available Online Date: 25.08.2020

© Copyright 2020 by Koşuyolu Heart Journal. Available on-line at www.kosuyoluheartjournal.com

of anticoagulants increases the risk of bleeding; hence it is not recommended. Therefore, it is important to employ the surgical procedures that do not require long-term or lifetime use of anticoagulants.

CASE REPORT

A 74-year-old female patient with dyspnea and mild exertion was admitted to our clinic. In her anamnesis, there was no special feature except hypertension and diabetes mellitus. Physical examination detected the presence of bilateral peripheral edema and bilateral rales in lung sounds. Laboratory tests demonstrated the following results: leukocytes= 3500/ μL , neutrophils= 1500/ μL , hemoglobin= 10 g/dL, hematocrit= 29.9%, and platelets= $187 \times 10^3/\mu\text{L}$. Atrial fibrillation (AF) rhythm was observed in the electrocardiogram (Figure 1). The echocardiogram showed an ejection fraction of 55%, severe mitral and tricuspid regurgitation, left atrial diameter of 49 mm, end-diastolic dimension of 56 mm, end-systolic dimension of 37 mm, and pulmonary arterial systolic pressure of 30 mmHg. While investigating the patient's hematological problem, urgent surgery was planned for the patient because of the progression of dyspnea.

Standard median sternotomy was performed on the patient, and cardiopulmonary bypass was instituted via arterial cannulation from the aorta and selective venous cannulation from superior and inferior vena cava. After performing a right atriotomy, the right atrial Cox-Maze IV lesion sets were performed on the beating heart by using argon cryoprobe (Cardioblate CryoFlex 10-S Surgical Ablation Probe, Medtronic, MN, USA). Then, after the insertion of cross-clamps, the heart was arrested with cold blood cardioplegia. The left atrial appendage was excised and primarily closed. After performing a left atriotomy, the left atrial Cox-Maze IV lesion sets were performed as described previously⁽³⁾. The cleft in the mitral valve p2 segment was repaired, and the 30-mm rigid ring (Medtronic Profile 3D, MN, USA) was implanted into the mitral annulus. Additionally, a 28-mm rigid ring (Medtronic Contour 3D, MN,

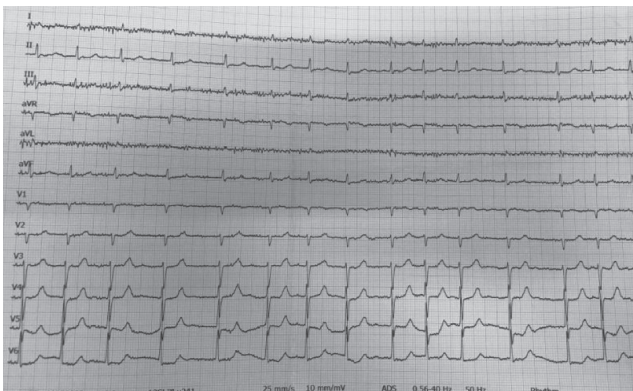


Figure 1. Preoperative electrocardiography.

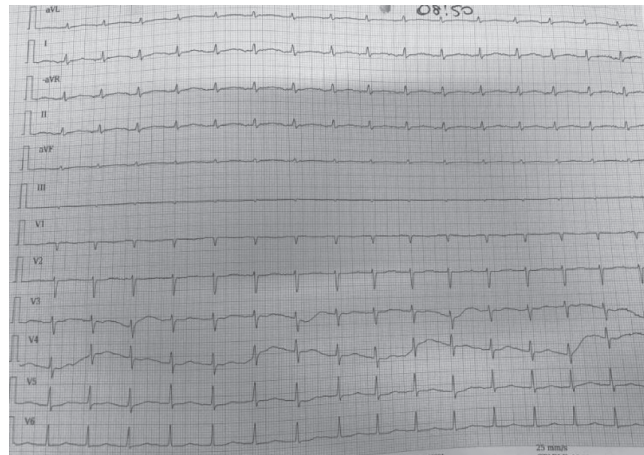


Figure 2. Postoperative electrocardiography.

USA) was implanted into the tricuspid annulus. Mitral and tricuspid valve regurgitation was not observed in intra-operative trans-esophageal echocardiography, and the patient had a sinus rhythm (Figure 2). No blood and blood products were used by the patient during the operation. The cardiopulmonary bypass time and aortic cross-clamping times were 237 minutes and 160 minutes, respectively.

The postoperative course was eventless. One unit of packed red blood cells was used because of postoperative anemia. No other blood and blood products were required postoperatively. The patient was discharged on postoperative day 7 in the sinus rhythm. Five days later, the patient was re-hospitalized for superficial sternal wound infection. Wound culture revealed *Pseudomonas aeruginosa* infection, which was treated with antibiotics. Three months after the surgery, she was still in sinus rhythm according to the 24-hour rhythm Holter examination. Her antiarrhythmic drugs were discontinued. She was diagnosed with MDS six months after surgery. She is currently under treatment for this hematologic disorder.

DISCUSSION

Untreated AF at the time of cardiac surgery requires a lifetime rate control and anticoagulation. Surgical ablations are accompanied by a reduction in mortality and stroke, both in the short and long terms. That is why the current guidelines recommend the surgical ablation of AF at the time of cardiac surgery. However, more than half of patients with concomitant AF do not receive surgical ablation for their AF⁽⁴⁾. Most surgeons prefer either omitting AF or doing lesion sets less than the ones described by Dr. Cox⁽³⁾. Doing less than the prescribed Cox-Maze IV procedure is dangerous as it results in the failure of AF surgery in a short term and lowers the confidence of surgeons and cardiologists in AF surgery.

Anticoagulation with rate control agents remains the viable treatment option for this patient population. A lot of patients

have a kind of contraindication for anticoagulant usage in time as they grow older with the possible development of new diseases. MDS is one of the such diseases.

MDS is a heterogeneous group of blood diseases that are usually presented as anemia, granulocytopenia, and thrombocytopenia⁽⁵⁾. MDS poses a problem in terms of infection and bleeding in open heart surgery⁽⁶⁾. However, another important issue to be considered is the postoperative anticoagulant use of patients. Performing surgery that does not require postoperative anticoagulant in patients with MDS prevents bleeding complications in the long term⁽⁷⁾. In addition to a successful mitral repair, as in our case, the surgical correction of AF (Cox-Maze IV) will protect the patient from bleeding caused by a postoperative anticoagulant use. In a study by Schaff et al., Cox-Maze procedure was found to correct AF in 90% of the patients⁽⁸⁾. The high success of the Cox-Maze procedure will eliminate the need for anticoagulant use in patients with MDS and prevent complications caused by bleeding.

In our case, urgent surgery was planned because of the patient's progressive dyspnea. Therefore, there was no preoperative diagnosis of MDS in the patient. There was no risk factor to explain anemia and leucopenia in the patient's anamnesis. The platelet count was normal at the time of surgery. We performed mitral and tricuspid repair along with AF surgery. Focusing on the treatment of arrhythmia at the time of cardiac surgery facilitated the treatment strategy for the patient's future diseases. We believe that AF should be addressed during the cardiac surgery because the maintenance of sinus rhythm might become crucial during follow-up.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept/Design - AZ; Analysis/Interpretation - AZ; Data Collection - AZ; Writing - AZ; Critical Revision - TA; Final Approval - KK; Statistical Analysis - AZ; Obtained Funding - AZ; Overall Responsibility - TA.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

- Odenike O, Anastasi J, Le Beau MM. Myelodysplastic syndromes. *Clin Lab Med* 2011;31:763-84.
- Omoto T, Hirota M, Ishikawa N, Tedoriya T. Mitral valve repair in a patient with myelodysplastic syndrome. *Ann Thorac Cardiovasc Surg* 2011;17:614-7.
- Adademir T, Khiabani AJ, Schill MR, Sinn LA, Schuessler RB, Moon MR, et al. Surgical ablation of atrial fibrillation in patients with tachycardia-induced cardiomyopathy. *Ann Thorac Surg* 2019;108:443-50.
- Badhwar V, Rankin JS, Ad N, Grau-Sepulveda M, Damiano RJ, Gillinov AM, et al. Surgical ablation of atrial fibrillation in the United States: trends and propensity matched outcomes. *Ann Thorac Surg* 2017;104:493-500.
- Czader M, Orazi A. World Health Organization classification of myelodysplastic syndromes. *Curr Pharm Des* 2012;18:3149-62.
- Yamagishi T, Fuse K, Saito T, Kato M, Misawa Y, Kamisawa O, et al. Successful coronary artery bypass grafting for a patient with myelodysplastic syndrome: report of a case. *Surgery Today* 1996;26:740-3.
- Taguchi T, Nishi H, Kurose K, Horikawa K, Kanazawa G, Takahashi T. Minimally invasive mitral valve repair via right mini-thoracotomy in patient with myelodysplastic syndrome. *J Cardiothorac Surg* 2018;13:45.
- Schaff HV, Dearani JA, Daly RC, Orszulak TA, Danielson GK. Cox-Maze procedure for atrial fibrillation: Mayo Clinic experience. *Semin Thorac Cardiovasc Surg* 2000;12:30-7.