

OPCAB treatment option for Coronary Artery Disease in Myelodysplastic Syndrome

Myelodisplastik Sendromda Koroner Arter Hastalığına OPCAB Üçlü
Bypass Tedavi Seçeneği
Kalp ve Damar Cerrahisi

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Özet

Bu çalışmanın amacı, çoklu damar koroner arter hastalığında myelodisplastik sendrom (MDS)'un etkilerini araştırmaktır. Bilinen MDS tanılı 72 yaşında erkek hasta, efor anjinası ile başvurdu. Koroner anjiyografisinde, özellikle sol ana koroner arter de %80 darlık olmak üzere çoklu segment koroner damar hastalığı (MVCAD) tespit edildi. Tam kan sayımında, trombosit sayısı $10-20^3/\mu\text{L}$ olarak ölçüldü. Trombosit sayısını arttırmak ve hemoraji gelişmesini önlemek amacı ile günlük iki kez, bir hafta boyunca trombosit replasmanı uygulandı. Bu olgu, çalışan kalp koroner bypass cerrahisi (OPCAB) sonrası; hemodinamik uygunsuzluk ve MDS'daki klinik zorluklar ile değişik derecelerde ciddi trombositopeni olması nedeniyle önemliydi. Hasta stabilizasyonu, trombosit sayısının arttırılması sonrasında sağlandı. Bu olgu, nadir rastlanması ve tedavi algoritmasındaki karar verme zorlukları sebebi ile sunulmuştur.

Anahtar kelimeler: *Trombositopeni, Myelodisplastik sendrom, Koroner stenoz, Kardiyak hastalıklar, Myelofibrosis.*

Abstract

The aim of this study is evaluate the outcomes of myelodysplastic syndrome on multivessel coronary artery disease. A 72-year-old male who had been diagnosed as myelodysplastic syndrome (MDS) referred for effort angina. On coronary angiography, critical 80% stenosis of the left main coronary artery and multivessel coronary artery disease (MVCAD) determined. On complete blood count the number of platelets was about $10-20^3/\mu\text{L}$. We administered platelet replacement twice daily to increase the number of platelets to prevent hemorrhage for a week. This case was characterized with hemodynamic instability and difficulties in MDS after off pump coronary artery bypass grafting (OPCAB) due to thrombocytopenia of varying severity. He was stabilized after increasing the number of platelets. Herein, we have published this case due to its rarity and difficulty in decision-making.

Keywords: *Thrombocytopenia, Myelodysplastic Syndrome, Coronary stenosis, Cardiac disorders, Myelofibrosis.*

Introduction

Myelodysplastic syndrome (MDS) is a rare disorder of hematopoietic stem cells that results with ineffective hematopoiesis. Clinically, MDS is presented with anemia, thrombocytopenia and neutropenia which is an independent risk factor for heart surgery, additively is known as to increase the risk of hemorrhage and infection or anemia during cardiac surgery. We reported here a case with MDS and severe multivessel coronary artery disease with hemodynamic instability underwent OPCAB operation. In similar cases, surgeons avoid operating because of disastrous complications. Rarely patients with left main coronary artery and multivessel coronary artery disease and MDS has been reported. Our extremely rare approach succeeded without any harmful complications in such a difficult case.

Case Report

A 72-years-old male who had been diagnosed as myelodysplastic syndrome (MDS) referred for effort angina. His physical examination was usual. Routine blood count and also biochemical measurements were normal. In PA chest radiograph, cardiothoracic ratio was increased with widened aortic knob (Figure-1).

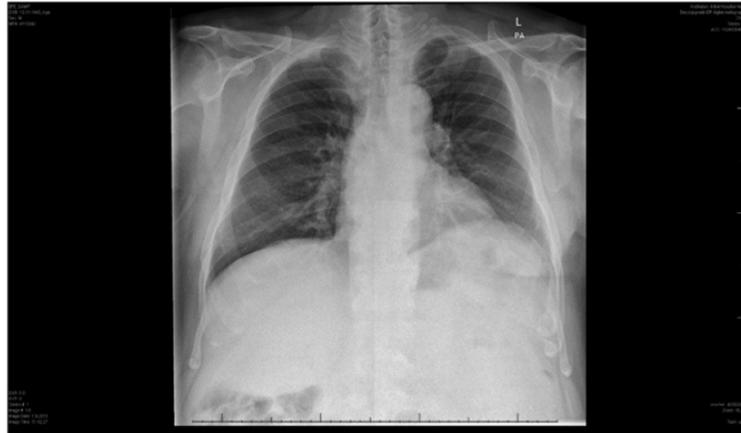


Figure 1
X ray image

Echocardiography revealed moderate aortic regurgitation and 40% ejection fraction. His pancytopenia improved gradually after reducing synthetic corticosteroids (danazol 200 mg/day). After blood and platelet transfusions the surgery was performed within appropriate hemogram values (Table1). Prophylactic antibiotics and infusion of blood products were used for pre-operative state.

	HGB	WBC	HTC	PLATELET
PREOPERATIVE	9,2 g/Dl	5.8 10 ³ /μL	28,5	78 10 ³ /μL
POSTOPERATIVE DAY 1	9,8 g/Dl	7.2 10 ³ /μL	30,6	118 10 ³ /μL
POSTOPERATIVE DAY3(TTRANSFER TO SERVICE)	8,5 g/Dl	9,0 10 ³ /μL	27,4	112 10 ³ /μL
POSTOPERATIVE DAY13 (DISCHARGE)	8,1 g/Dl	3,9 10 ³ /μL	25,4	40 10 ³ /μL

Table 1
hemogram results

Coronary artery disease (CAD) diagnosed by coronary angiography showed right coronary artery (RCA) 90%, RCA PDA branch 80%(Figure 3A), left anterior descending (LAD) 90%, circumflex artery (CX) 80% proximal

stenoses (Figure 3B).

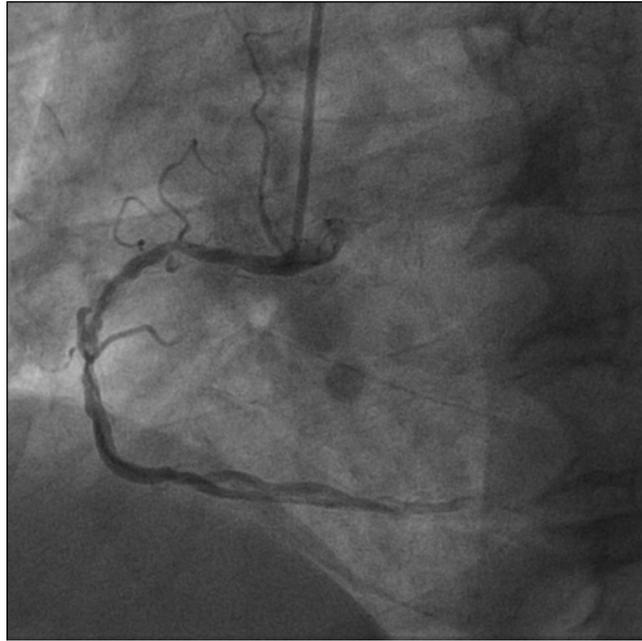


Figure 3A

Coronary angiography image



Figure 3B

Coronary angiography image 2

Treatment of pancytopenia with transfusion of red blood cells and platelets preoperatively followed with off-pump coronary artery bypass grafting. 3-vessels OPCAB (LIMA-LAD with left internal thoracic artery, AO-RCA PDA (posterior descending branch) and AO-CX OM1 (obtuse marginal branch) with saphenous vein grafts) established. Proximal ones performed after the distal anastomoses to protect the stabilization. We preferred OPCAB in order to decrease activation of complements. A large amount of transfusion of red blood cells or platelets in intra-operative and postoperative states was not required. Major bleeding was avoided and controlled during the OPCAB. Heparin reversal established and granulocyte colony stimulating factor was not used. The

amount of chest drainage was totally 400 ml and drain was taken 3 days postoperatively to avoid bleeding.

He was hemodynamically stable without inotropic support and had no any high fever in intensive care unit (ICU) period. Post-operative chest radiograph showed as usual lungs (Figure-2).

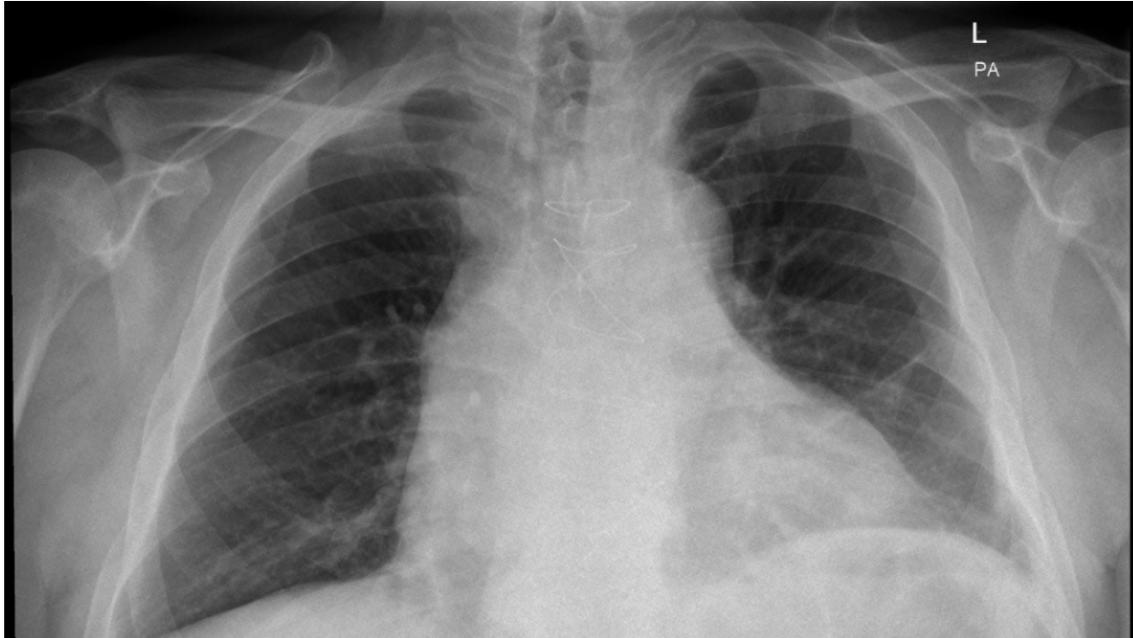


Figure 2
X ray image 2

In the follow-up period our patient developed any comorbidites. Patient treated with the standard anticoagulant therapy (acetyl - salicylic acid 100 mg/day and clopidogrel 75 mg/day per oral) was given to protect graft patency. Patient was discharged without any complication.

Case Discussion

This rare case was important for hemodynamic instability and difficulties in MDS after OPCAB due to thrombocytopenia. Furthermore, many surgeons avoid surgery in cases with MDS because of disastrous complications. MDS increases the risk of hemorrhage and infection or anemia in cardiovascular surgery. We preferred surgery for critical stenosis of the left main coronary artery and MVCD. We succeeded operation by platelet transfusion twice daily. We saw pancytopenia was improved gradually by reducing the synthetic corticosteroids (danazol 200 mg/day). Prophylactic antibiotics and infusion of blood products were used peri-operative state.

Three percent to 4% of platelet groups have been detected on blood count and microscopic examination. Acute MDS was diagnosed as “unclassified (MDS-U)” according to WHO classification of MDS. The Revised Prognostic Scoring System (IPSS-R) was calculated to be <1.5 (very low). He was interpreted as acute myofibrosis. Medical treatment with danazol was continued. Department of Hematology has concluded the case as a high risk patient for open heart surgery and suggested platelet and appropriate blood products transfusion to keep platelet level above 100000 /mm³. Daily blood counts and microscopic examinations were performed during postoperative period.

We preferred OPCAB in order to reduce activation of complements and cardiopulmonary bypass related coagulopathy. Perioperative and surgical follow-up is important in patients with MDS. Management of internal emergencies was also carried out by consultation with the internal medicine and hematology specialists. Modern surgical techniques and experiences has reduced the importance of MDS in heart surgery. Treatment of post-OPCAB with MDS can be managed successfully with effective physician-to-physician communication. Herein, we have shared this case due to its rarity and difficulty in decision-making.

MDS presented with refractory anemia, accompanied by various degrees of granulocytopenia and pancytopenia^{1,2}. Thrombocytopenia and neutropenia caused by MDS can complicate cases with major infections and bleeding during cardiac surgery. We prefer OPCAB for hemodynamically unstable patients with other organ-system problems. For cardiac surgery, MDS is an independent risk factor for postoperative mortality and morbidity. OPCAB is indicated in the following problems for the fear of complications: severe aortic calcification, carotid artery stenosis, history of stroke, renal dysfunction, pulmonary artery diseases and other independent risk factors³⁻⁵. Shortened length of hospital stay, decreased respiratory period and decreased pulmonary complications, less bleeding and blood transfusion, decreased inflammatory response, decreased arrhythmias have associated with OPCAB outcomes^{4,5}.

However, limited cases were reported about MDS with MVCD. Ganti and colleagues have demonstrated that the major myeloproliferative syndromes (MPS) [polycythemia vera (PV), essential thrombocythemia (ET), chronic myeloid leukemia (CML) and myelofibrosis (MF)], PV and ET were reported to be associated with increased thrombotic complications⁶. According to this study, the relationship between these MPS's and coronary artery disease (CAD) is unclear. In addition, they showed that after adjusting for age, sex, dyslipidemia, diabetes, hypertension and tobacco use, the difference in the prevalence of CAD between the various categories of MPS was not significant⁶. Gangwani and colleagues have described that the perioperative management was challenging because of associated anaemia, pancytopenia and immunosuppression⁶. These patients also have the tendency to bleed not only due to associated thrombocytopenia but also due to the cardiopulmonary bypass related coagulopathy⁷. Enblom and colleagues conclude that a large proportion of MDS patients suffer severe thromboembolic complications prior to diagnosis⁸. According to this study, if MDS was diagnosed earlier, a large proportion of these events can be prevented⁸. Clinicians who care for patients with MDS should be aware of upper risk of severe thromboembolic complications and cardiac disorders in this population^{9,10}. Thromboembolic complications and bleeding stand as the main complications in MDS.

His coronary angiography revealed critical stenosis of the left main coronary artery and severe proximal stenoses of 3 vessel disease. We presented OPCAB on triple vessels using left internal thoracic artery and saphenous vein grafts (SVG). Standard doses (1-1.5 mg/kg) of systemic heparin had been applied. The target 'activated clotting time' (ACT) was greater than 300-350 seconds. Left internal mammary artery (LIMA) was prepared as long as possible. The grafts were harvested with scissors and hemoclips used for bleeding. The grafts had protected inside of 'perlingalit' (1.0 mmol/L) mixed with heparinized blood. Also, heparinized blood was injected intraluminally into the saphenous vein grafts after harvesting. SVG was commonly used for the obtuse marginal branches and/or the posterior descending coronary artery. Heparin reversal established. Red blood cells and platelets transfusions had used twice daily to increase the number of the granulocytes in peri-operative state. We avoided major bleeding and severe sternal infections. His follow-up was uneventful. The patient discharged with acetylsalicylate 100 mg / day and clopidogrel 75 mg / day peroral treatment. In the 1st postoperative month, functional capacity improved dramatically. New York Heart Association functional class (NYHA) IV (preoperatively) moved to II.

Heart surgery can be performed in cases with myelodysplastic syndrome who have significant comorbidities that highlights the technical considerations to be kept in mind. OPCAB with MDS cases should be performed by experienced teams.

We think, it was an interesting case of successful management in MDS who underwent open-heart surgery.

Consequently, in MDS, cardiovascular surgery with OPCAB can give simple and successful results.

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