Early Stent Thrombosis after Percutaneous Coronary Intervention (PCI): a case report

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ABSTRACT

Stent thrombosis is a rare complication but have around 15-45% case fatality rate. Early stent thrombosis in first 24 hours after PCI still accounts for 6-25% from all stent thrombosis cases. This article will discuss a 60 year-old male brought to emergency with chest pain, shortness of breath, and diaphoresis. The chest pain was started 1.5 hours prior to admission felt as a heavy sensation in the chest. The patient has a history of diabetes, hypertension, and dyslipidemia. One week prior to admission, 2 drug eluting stent (DES) on proximal left anterior descending (LAD) and distal left circumflex (LCx) were placed. Clopidogrel and aspirin were consumed routinely as an antiplatelet. The patient diagnosed with early stent thrombosis and cardiogenic shock. Coronary artery bypass graft surgery with 4 grafts was successfully done the day after, intra-aortic balloon pump and temporary pacemaker were reserved until 2 days post-surgery. Clopidogrel was shifted to ticagrelor post-surgery and combined with aspirin. No event of subsequent acute coronary syndrome was observed.

Keywords: Early stent thrombosis, percutaneous coronary intervention, thrombolysis

ABSTRAK

Trombosis *stent* merupakan komplikasi yang jarang namun angka kematiannya tinggi hingga 15-45%. Kasus trombosis *stent* dini dalam 24 jam pertama setelah PCI merupakan 6-25% kasus trombosis *stent*. Dalam artikel ini akan dibahas seorang laki-laki 60 tahun yang dibawa ke ruang gawat darurat dengan nyeri dada, sesak napas, dan keringat dingin. Nyeri sejak 1,5 jam sebelum masuk rumah sakit terasa sebagai sensasi berat di dada. Pasien memiliki riwayat diabetes, hipertensi, dan dislipidemia. Satu minggu sebelumnya, telah dilakukan pemasangan *stent* berlapis obat (DES) di *proximal left anterior descending (LAD)* dan *distal left circumflex (LCx)*. *Clopidogrel* dan aspirin sebagai *antiplatelet* dikonsumsi rutin. Pasien didiagnosis trombosis *stent* dini dan syok kardiogenik. Operasi bedah pintas koroner jantung (CABG) dengan 4 *graft* dilakukan 1 hari kemudian, IABP (*intra-aortic balloon pump*) dan alat pacu jantung sementara dipasang dan dipertahankan selama 2 hari setelah operasi. *Clopidogrel* diganti dengan *ticagrelor* setelah operasi dan dikombinasikan dengan aspirin. Setelah itu tidak ada lagi kejadian sindrom koroner akut. **Andreas Willianto, Martin Hendrata. Trombosis *Stent* Dini pada Pasien setelah *Percutaneous Coronary Intervention* (PCI): laporan kasus**

Kata kunci: *Percutaneous coronary intervention*, trombolisis, trombosis stent dini,

INTRODUCTION

Bleeding and thrombosis have always been a dilemma in treatment of patient with acute coronary syndrome. Although incidence of stent thrombosis decline to 40-70% after Drug Eluting Stent (DES) were used rather than Bare Metal Stent (BMS), the occurence rate is still 1-2% for all PCI cases.[1-3] Stent thrombosis is a rare complication, but have a high case fatality rate of around 15-45%. Acute stent thrombosis in the first 24 hours after PCI still accounts for 6-25% from all stent thrombosis cases.[3] The rate of stent thrombosis increased in patients with diabetes mellitus, bifurcation stent, and in patient who do not comply with antiplatelet therapy.[4]

CASE

A 60 years-old male was brought to emergency room with chest pain, shortness of breath, and diaphoresis. The chest pain was started 1.5 hours prior to admission and described as a heavy sensation. The patient has a history of diabetes, hypertension, and dyslipidemia. One week prior to admission, medical checkup was done in another hospital. Coronary angiography showed stenosis on proximal left anterior descending (LAD) and distal left circumflex (LCx), thus 2 DES stents were placed. Clopidogrel and aspirin were given as an antiplatelet and consumed routinely.

Upon examination, the patient was alert and cooperative. The blood pressure was 94/71 mmHg, pulse rate 63 beats per minute, respiration rate 23 breaths per minute, and oxygen saturation was 100% on 2 liters oxygen per minute via nasal cannula. Electrocardiography showed anterior ST elevation and cardiac enzymes were elevated. Echocardiography showed akinetic of the anteroseptal wall and left ventricular ejection fraction of 30%. Coronary angiography showed stent thrombosis in both stents. Balloon angioplasty was done but the

result was not optimal. Hemodynamic was further impaired, blood pressure was slowly decreased. The patient then diagnosed with early stent thrombosis and cardiogenic shock.

Eptifibatide were given post-procedure, dobutamine and norepinephrine were given to maintain blood pressure but the response was not significant. Intra-aortic balloon pump was inserted while waiting for coronary artery bypass graft surgery. After the procedure, the electrocardiography evolved to right bundle branch block and first degree AV block. The next day, complete heart block was developed hence temporary pacemaker placement was done through left femoral vein.

Figure. Coronary angiography showed in stent thrombosis

Coronary artery bypass graft surgery with 4 grafts was successfully done the day after, intra-aortic balloon pump and temporary pacemaker were reserved until 2 days post-surgery. Clopidogrel was shifted to ticagrelor post-surgery and combined with aspirin. ECG showed sinus rhythm with frequent ventricular extra systole and non-sustained ventricular tachycardia. Implantable Cardioverter Defibrillator (ICD) implantation was advised to reduce the risk of sudden cardiac death. The patient then discharged after 7 days post-surgery and Cardiac Resynchronization Therapy – Defibrillator (CRTD) implantation was done 2 months later with no complication.

DISCUSSION

Stent thrombosis is a rare complication, but have a high case fatality rate of around 15-45%. Early stent thrombosis in the first 24 hours after PCI still accounts for 6-25% from all stent thrombosis cases.[3] Many strategies for prevention of early stent thrombosis has been developed. Integer-based risk score may be applied to patient planned for PCI. This risk score may be used to identify patients who might benefit most from more aggressive antiplatelet therapy after stent implantation.[4]

Recently, multiple risk factors associated with stent thrombosis were reported. Patients with STEMI, multi-vessel coronary artery disease, low left ventricular ejection fraction (EF), small stent diameter, long segmental stenosis and younger age have the higher risk of early

stent thrombosis. This case is an example of myocardial infarction with multi-vessel disease who received PCI on multi-vessel stenosis. In these cases, the physician should be alert to new onset or aggravation of chest pain or sudden abnormal findings of vital signs.[5,6]

The most important aspect for the diagnosis and treatment is clinical suspicion of early stent thrombosis. Currently the diagnostic and treatment strategies are not well defined. Emergent repeat PCI (thrombus aspiration, balloon dilatation) is commonly employed, and glycoprotein IIb/IIIa inhibitor is also used as 'rescue' therapy. Glycoprotein IIb/IIIa inhibitor inhibited platelet aggregation, thrombus formation, and furthermore, induced lysis of fresh thrombus. Furthermore, development of biodegradable stents might also be a way to decrease the incidence of late and very late stent thrombosis.[7]

In this case, thrombus aspiration and balloon dilatation were employed but the result was suboptimal. Clopidogrel was changed to ticagrelor and eptifibatide was used. Coronary artery bypass surgery is opted to revascularize the blocked coronary artery. The myocardial infarction was severe enough to cause electrical activity disturbances; complete heart block was resolved after surgery but frequent ventricular extrasystole and a couple of non-sustained ventricular tachycardia episodes still occur. CRTD was opted to optimize cardiac function and to prevent malignant arrhythmia that can cause sudden cardiac death.

REFERENCES:

1. Kim SS, Jeong MH, Sim DS, Park KH, Hong YJ, Kim JH, et al. Sequential development of cardiac tamponade and subacute stent thrombosis after primary percutaneous coronary intervention for acute ST-segment elevation myocardial infarction: A case report. Journal of Cardiology Cases. 2010;1:75-9.

2. Palmerini T, Kirtane AJ, Serruys PW, Smits PC, Kedhi E, Kereiakes D, et al. Stent thrombosis with everolimus-eluting stents: Meta-analysis of comparative randomized controlled trials. Circ Cardiovasc Interv. 2012;5:357-64.

3. Shin HS, Kim SH, Kim HL, Seo JB, Chung WY, Zo JH, et al. Acute stent thrombosis after coronary stenting in patients with acute coronary syndrome. J Lipid Atheroscler. 2014;3:43-8.

4. Brener SJ, Cristea E, Kirtane AJ, McEntegart MB, Xu K, Mehran R, et al. Intra procedural stent thrombosis: A new risk factor for adverse outcomes in patients undergoing percutanenous coronary intervention for acute coronary syndromes. JACC. 2013;6:36-43. doi: 10.1016/j.jcin.2012.08.018.

5. Aoki J, Lansky AJ, Mehran R, Moses J, Bertrand ME, McLaurin BT, et al. Early stent thrombosis in patients with acute coronary syndromes treated with drug-eluting and bare metal stents: The acute catheterization and urgent intervention triage strategy trial. Circulation 2009;119:687-98.

6. Park SH, Hong GR, Seo HS, Tahk SJ. Stent thrombosis after successful drug-eluting stent implantation. Korean Circ J. 2005;35:163-71.

7. Akhtar MM, Jones DA, Gallagher S, Weerackody R, Sammut E, Rathod KS, et al. 035 Thrombectomy and platelet glycoprotein IIB/IIIA blockade for stent thrombosis. Heart 2012;98:22.