

## Case Report: STENT DISLODGEEMENT

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### ABSTRAK

*Laki-laki usia 61 tahun yang mengalami angina stabil sejak 1 bulan lalu, dengan faktor risiko CAD: hipertensi, dislipidemia dan perokok berat. ECG menunjukkan infark miokard lama yang rendah. Angiografi koroner diagnostik menemukan: lesi bifurcatio di distal LMCA dengan stenosis signifikan 60% pada LM distal dan 85% di LCX osteal (Medina skor 1-1-0), D1 tinggi dan penyakit menyebar dengan stenosis maksimal 85% pada LAD distal setelah D2, stenosis signifikan 85% di LCX osteal dan CTO di distal setelah OMI, difus penyakit dengan maksimal stenosis 85% pada pertengahan RCA. Sebuah kateter 6-Fr JR 4.0 (Launcher, Medtronic) terlibat ke dalam ostium arteri koroner kanan melalui femoral pembuluh darah. GW percontohan 50 (Hi-Torque Percontohan 50) dimasukkan ke distal RCA. Peran balloon didukung oleh Sapphire II yang dimasukkan ke pertengahan RCA dan melebar, setelah itu peran balloon ke proksimal RCA dan melebar. Stent DES Firebird II (Rapamycin) sampai pertengahan RCA dan melebar. Stent BMS Apollo 3.0x36 mm dimasukkan untuk proksimal-mid RCA, tumpang tindih dengan stent sebelumnya, namun dihilangkan atau dicabut dan dimasukkan ke kateter. Stent BMS ditarik keluar dengan bekas stent balloon kecil. GC 6F 4.0 dimasukkan untuk menaikkan aorta dan terlibat di ostium RCA. Stent BMS Arthos PICO 3.0x 34 mm dimasukkan ke proksimal-mid RCA, tumpang tindih dengan stent sebelumnya dan melebar. Angiography akhir dikonfirmasi sukses menarik keluar dari kehilangan stent dan pelebaran RCA. (FMI 2016;52:219-224)*

**Kata kunci:** *difus penyakit dengan stenosis maksimal, RCA, kehilangan stent atau dislodgement, teknik balloon kecil.*

### ABSTRACT

*Male 61 years old who presented with stable angina since 1 month ago, with Risk factor of CAD: hypertension, Dyslipidemia and heavy smoker. The ECG showed inferior old myocardial infarction. Diagnostic coronary angiography found: bifurcatio lesion at distal LMCA with significant stenosis 60% at the distal LM and 85% at the osteal LCx (Medina score 1-1-0), high D1 and diffuse disease with maximal stenosis 85% at the distal LAD after D2, Significant stenosis 85% at the osteal LCx and CTO at the distal after OMI, diffuse disease with maximal stenosis 85% at the mid RCA. A 6-Fr JR 4.0 guiding catheter (Launcher, Medtronic) was engaged into the right coronary artery ostium via the femoral artery. GW pilot 50 (Hi-Torque Pilot 50) inserted to distal RCA. Perform Balloon support by Sapphire II inserted to mid RCA and dilated, after that perform balloon to proximal RCA and dilated. Stent DES Firebird II (Rapamycin) to mid RCA and dilated. Stent BMS Apollo 3.0x36 mm inserted to proximal-mid RCA, overlapping with previous stent, but was loss or dislodged and insert to the guiding catheter. BMS stent was pulled out with small balloon ex stent. GC 6F 4.0 inserted to ascending Aorta and engaged at ostium RCA. BMS stent Arthos PICO 3.0x 34 mm inserted to proximal-mid RCA, overlapping with previous stent and dilated. Final angiography confirmed successful pull out of loss stent and dilation of the RCA. (FMI 2016;52:219-224)*

**Keywords:** *diffuse disease with maximal stenosis, RCA, stent loss or dislodgement, small balloon technique.*

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### INTRODUCTION

Interventional cardiology has developed very quickly following the development of Drug Eluting Stents (DES). DES make their Percutaneous Coronary Interventions (PCI) more simple, durable, and safe. With the presence of such a device, the handling of cases of complex coronary is increasing in numbers. One of the problems that arises is the discharge of the instrument into the vessel wall and stent damage (Hur et al 1997). While the term stent dislodgement or released

is an extremely rare complication. The incidence of stent dislodgement produces embolic complications that require emergency heart surgery until the occurrence of death. More advanced development equipment design of catheterization can reduce the incidence of stent dislodgement, also some of the techniques of removal are quite varied (George et al, 2009).

Stent damage as a complication of folded stent is a rare incident, ranging from 1-16%. The incidence of damage to the stent starts to become a great concern after the

installation of DES due to a close relationship with the incidence in stent restenosis (ISR) and stent thrombosis (Lee et al, 2009). Specifically, stents, catheters or wire that loose into coronary circulation cause thrombosis and myocardial infarction. The incidence of stent loss of 3.4% has been reported earlier and 0.32% in subsequent reports (Eggebrecht et al 2000). However, reports of incidence of stent after DES era is are. This article discusses case of loosened/dislodgement and damage to the stent.

## CASE REPORT

A man named Mr. S, 61 years old, Javanese, lived in Mojokerto. The patient had undergone hospitalization in a hospital in Mojokerto because of heart attack. The patients had history of complaints of chest pain since one month before undergoing catheterization. The complaint was felt increasingly advancing. We obtained his past history of hypertension, smoking history, and the presence of dyslipidemia.

Physical examination revealed moderate general condition, GCS 456, with a blood pressure of 130/80 mm Hg, pulse 88x/min regular, breath frequency 20x/minute, the temperature of 36.7°C. On examination of

the head and neck no abnormalities were found. On examination of the heart, ICS V ictus cordis in the left mid-clavicular line, S1, S2 single. On examination of the lungs, vesicular breath sounds, we found no ronchi or wheezing. Abdominal examination showed the liver and spleen were not palpable. Extremity examination found no abnormality. ECG Examination showed sinus rhythm 72x/minute, old inferior myocardial infarction. Laboratory tests revealed L = 7100, BUN = 16.7, K = 4.09, Plt = 222000, SGPT = 24, Cl = 99, SGOT = 13, SK = 1.0, Kol Tot = 179, TG = 198, Na = 147, Hb = 134, and GDA = 162

Then, the patients performed coronary angiography with the results:

LMCA revealed bifurcation in distal LMCA lesions with significant stenosis of 60% in distal LMCA and significant stenosis 85% in osteal Cx (Medina Score 1-1-0). LAD reveale High D1, diffuse disease with maximal stenosis of 85% in the distal LAD after D2, collateral gr. II of septal branch to the distal LAD to LCx. LCx was non-dominant, showing significant stenosis 85% in osteal Cx. CTO looked at the distal Cx after OM1

RCA: Dominant. Looks diffuse disease with maximal stenosis of 85% in the mid RCA.



Fig. 1. Overview of coronary angiography (LMCA: Left the main coronary artery, LAD: Left Anterior Descendent artery, Cx: Left cicumflex artery, RCA: Right Coronary Artery)

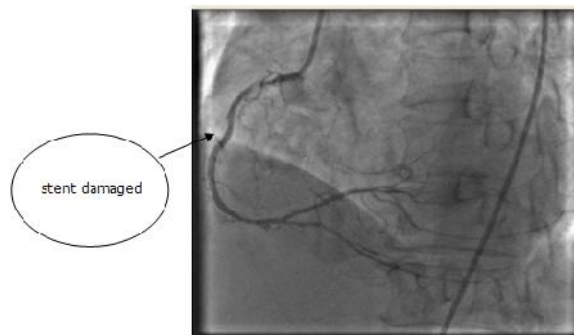


Fig. 2. An angiography showed damaged stent.



Fig. 3. A shape of the stent has been successfully removed

Then the patient performed PTCA with the steps as follows: Guide wire (GW) Pilot 50 was entered toward distal Right Coronary Artery (RCA) continued with predilatation of Saphirre II balloon 1.5 x 15 mm towards mid RCA, then the stenting DES Firebird II (rapamycin) in mid RCA was performed followed with Bar Metal Stents (BMS) Apollo stenting 3.0 x 36 mm in prox-mid RCA overlapping with the stent in the distal. However, the stent loosened/dislodged and entered the Guiding Catheter (GC). Then the stent was removed using a small balloon ex stent technique. Then it was proceeded with the installation of a new stent BMS Arthos PICO 3.0 x 34 mm in prox-mid RCA, overlapping with the stent in the distal. The outcome was good and residual stenosis was 0%. During and after the procedure complications were not found.

**DISCUSSION**

The incidence of stent loss (SL) causing damage to the stent is extremely rare in the era of DES and are rarely reported in the literature. For example, there is a failure to take the catheter using amplatz gooseneck snare loop. Furthermore, there has been development a technique using "simple balloon technique" to develop guiding catheter balloon in the stent so that the damaged and loose can be attached to the inner wall of the guiding catheter. It was also decided to use the type of non-

compliant balloon at high pressure than the compliant balloon types to capture stent damaged at the time of the action. The technique will be difficult to do on a stent that was broken in the DES era. After the initial literature search, there are a few techniques found in the damaged stent retrieval from India and Taiwan (Fujita et al 2003, Trehan et al 2003). Incidence of dislodged stent is over 8% per day. Some retrieval techniques that of dislodged stent has been evaluated previously with fairly high success rate reaching 86% (George et al, 2009).



Fig. 4. The final result after the installation of the new stent

Broken stents become particular concern since the installation of DES is associated with ISR and stent thrombosis. ISR mechanism of the damaged stent is associated with lower levels of drug on the damaged site of the stent, and high mechanical irritation due to smooth muscle proliferation and disrupted reendothelialization. Stent defect also relates to the size of the stent length, stent overlap, stent overexpansion, and calcified lesions (Canan & Lee, 2010).

There is a decrease in the incidence of loosened stent in the last few years. This is supported by the development of stent with better shape and perfect adhesion. At first, the stent is easily to loose if there is no contact with area subjected to ballooning. Stent is generally made to be able to attach to the stent catheter balloon using adhesive machine and it will significantly decrease the incidence of stent loose (Brilakis et al 2005). Other predisposing factors that may cause the stent loosen are anatomic aspects and techniques during the procedure. Complex lesion anatomy, such as the presence of the tortuous blood vessels, long diffuse lesions, and severe calcification of the lesion, may need special attention to prevent loss of the stent at the time of withdrawal. On the technical factor, too excessive maneuvering on the stent without sufficient predilatation may cause deformation and distortion of the stent itself. The

withdrawal of the stent that is not fixed properly on the situation increases the risk of stent loose (Wani et al 2010). If the stent is loose and broken and no immediate withdrawal of the coronary arteries is done by percutaneous device, it will be able to cause coronary thrombosis and continue until the occurrence of myocardial infarction. This situation would soon need a heart surgery to take the stent apart. Stents that regardless of the position in the ascending aorta can cause severe neurological events due to systemic embolism (Eggebrecht et al 2000).

There are several variations of the method of taking loosened stent described by some literatures, such as by using snare, forceps variations, even angioguard (distal part protection tool), simple balloon, and pressing the stent toward the wall of the blood vessel by a balloon (Foster-Smith et al 1993). Stents is formed in accordance with the area in the vascular system. However, difficult movement of the stent may still be found to be because of the size and rigidity of the blood vessels. We need to decide whether the loosened stent is possible to remove or moved to relatively safer areas. The high risk of the removal depends on maneuvers, such as trauma to blood vessels wall, rupture or perforation (Sheiban 2010).

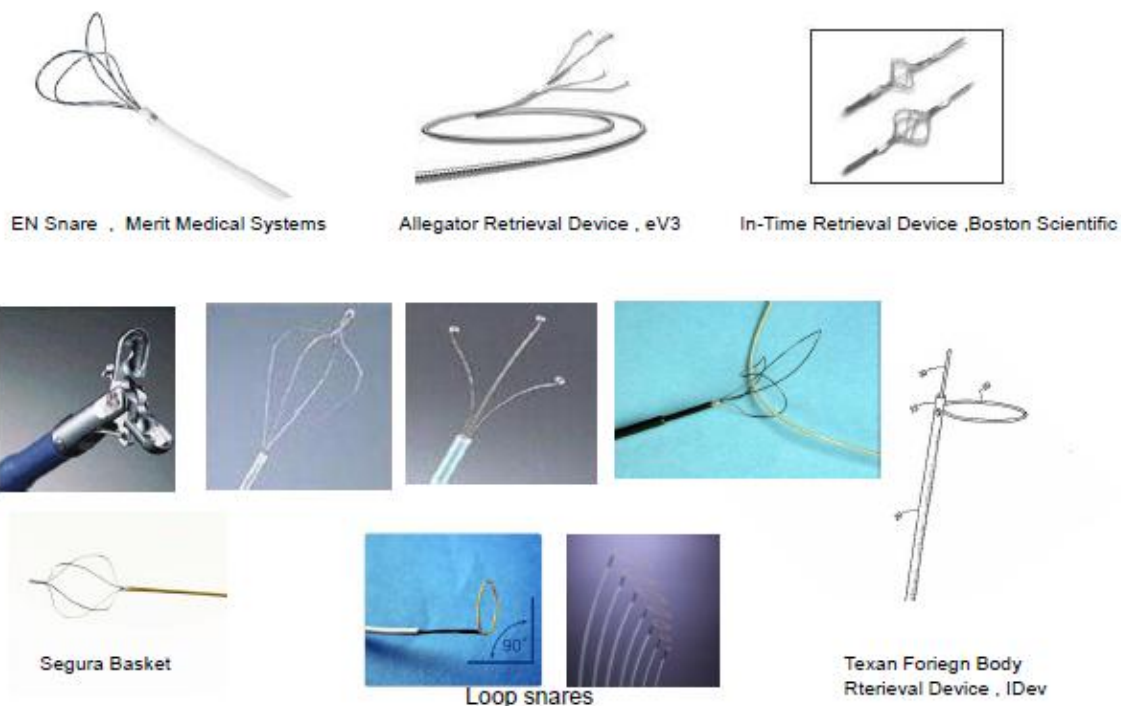


Fig. 5. Some types of tools to retrieve foreign bodies in blood vessels (Sheiban 2010).

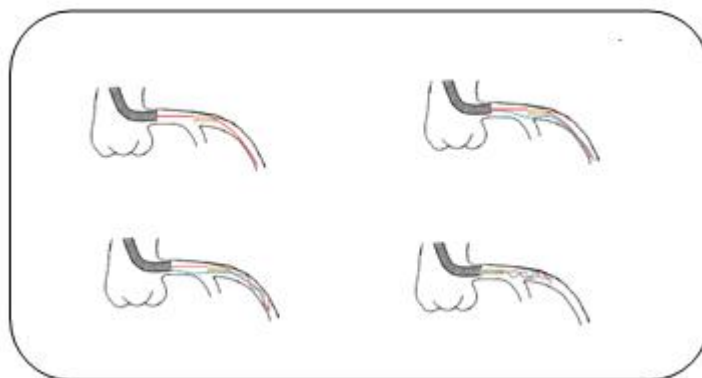


Fig. 6. Two wire technique (Sheiban 2010).

One other way to take stent apart is by the technique of "two wire". This method uses two wires, where one wire is inserted past the stent experienced a dislodged while the other wire is inserted through the area beside the stent. Both wire and then wound together until the coil can attract experienced stent dislodgement (Sheiban 2010).

In this case the broken stent loose was taken by the method of small balloon stent ex. The wire was inserted past the dislodged stent, then developed a balloon at the distal end of the stent, and the guiding catheter, balloon and the stent were drawn together (Sheiban 2010).

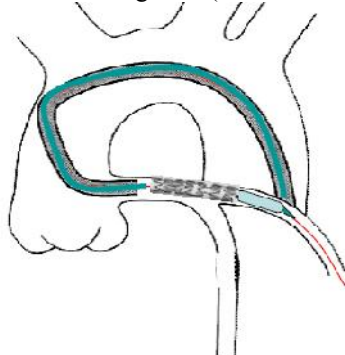


Fig. 7. Small balloon technique (Sheiban 2010).

To anticipate the occurrence of stent loose, we require an understanding of the character of the lesions using Intravascular ultrasound (IVUS). This examination provides information about the distribution of calcification and plaque. If there are doubts about the failure to penetrate the lesion that may add to the complications, then it takes a more mature preparation before taking action especially if IVUS inspection cannot be performed (Wani et al 2010). Today, IVUS imaging plays a very important in view of the position damaged stent. Here is a picture of stents that were damaged.

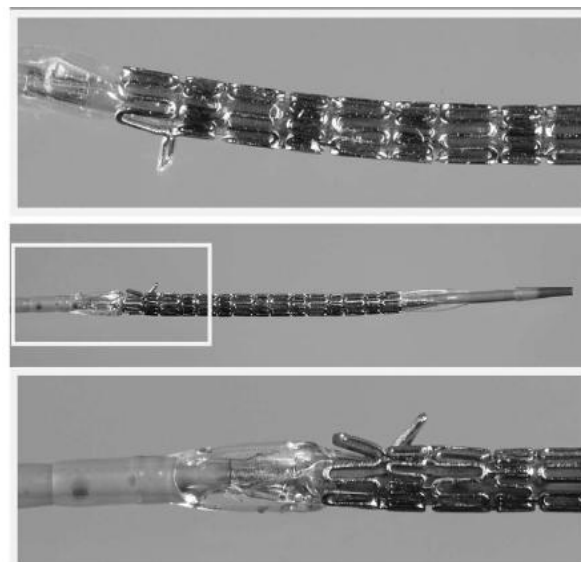


Fig. 8. Examples of stents that was broken in the distal part of the lead dislodgement (Roffi et al 2006).

## CONCLUSION

We have reported a male patient Mr. S, 61 years old underwent coronary angiography with the diagnosis Tripple Vessel Disease. With a history of previous coronary heart disease and hospitalized in Mojokerto he was then sent to our center to undergo catheterization. We performed Percutaneous Transluminal Coronary Angioplasty (PTCA) stent in the RCA. But by the time of the second stent installation, damage had occurred and resulted in stent loosening or dislodgement. This was due to technical aspects of the procedure before the action was performed. Stents were broken and taken apart by the method of Small balloon ex stent and it was successful. Then, we reassembled new stent in the site of the dislodgment with good outcome.

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