Totally occluded distal left anterior descending artery caused by distal embolization of left main coronary artery thrombus; which is the best treatment?

CHOE SEONGIL

Hanyang University Kuri Hospital,

KOREA

Male / 46, Rest chest pain

Present Illness:

He was diagnosed as stable angina for effort chest pain 1 year ago, he did not any medication. He had been exertional chest pain for the past few weeks and on the very day, he complained of the severe chest pain which was sudden onset, unremitting and lasting over 60 minutes

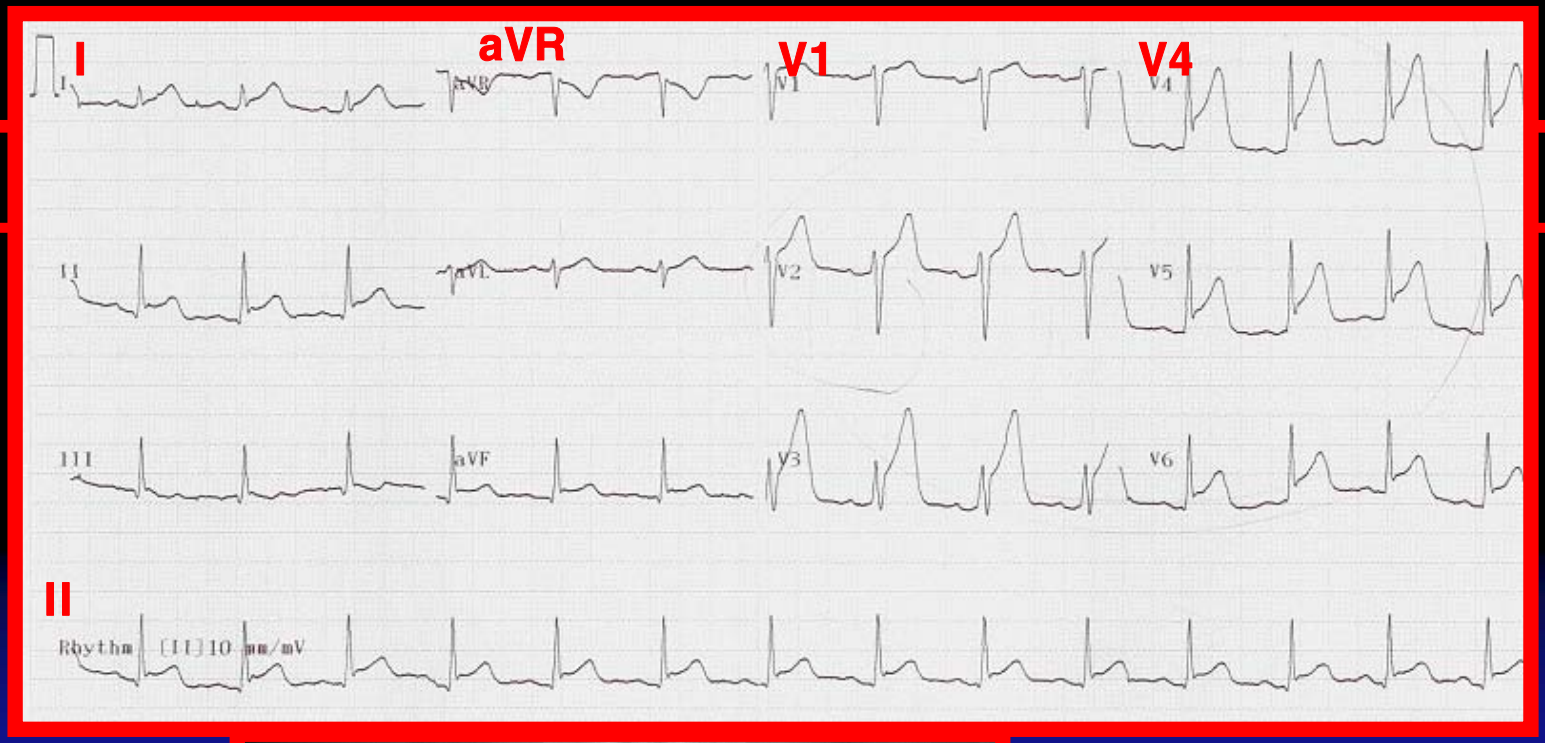
Cardiovascular risk factor: 1 pack / day X 25 years

Alcohol: Social

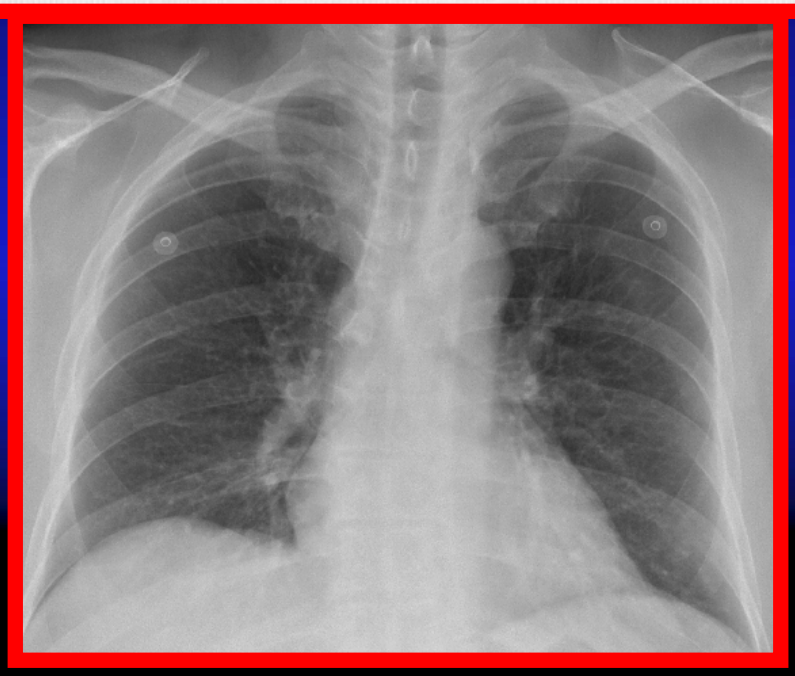
Vital Sign: 36.5 ℃– 20 – 75 BPM– 138 / 86 mmHg

Physical Exam: Regular heart beat without murmur

Initia
l
EKG



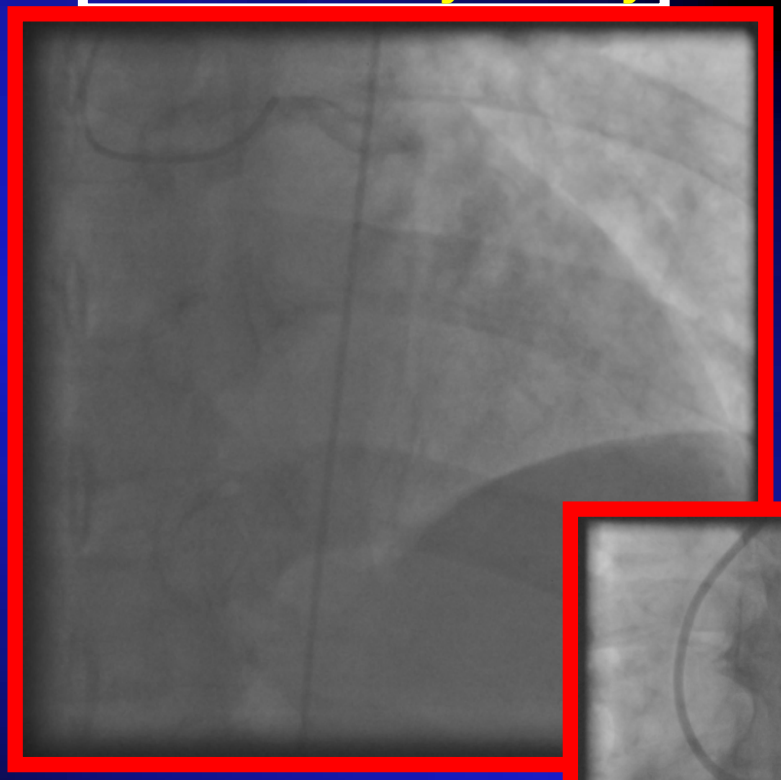
Initial
Chest AP



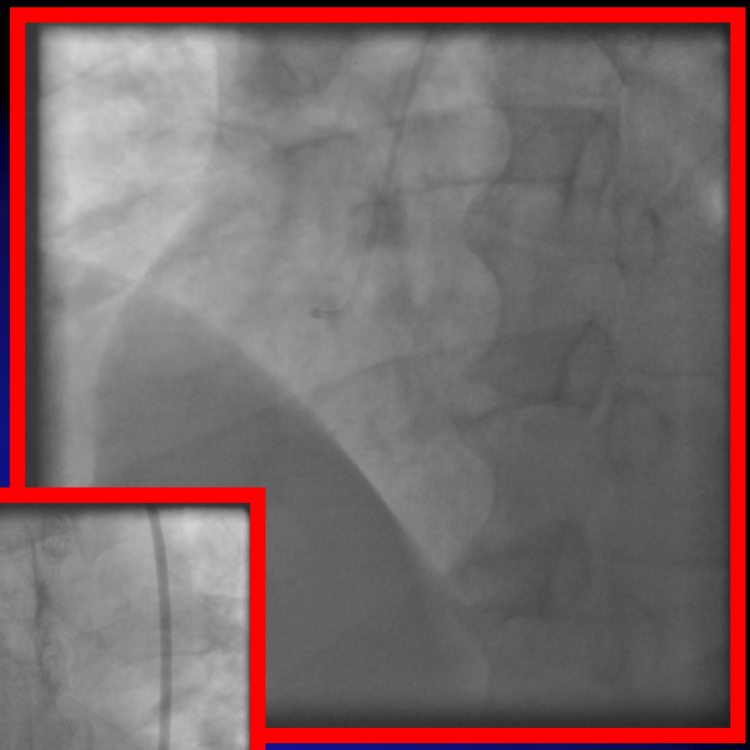
Aspirin & Clopidogrel administeration.

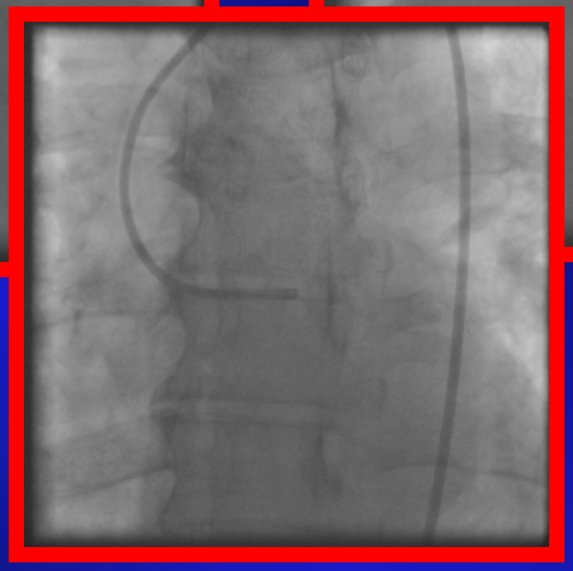
Coronary angiogram

Left coronary artery



Right coronary artery

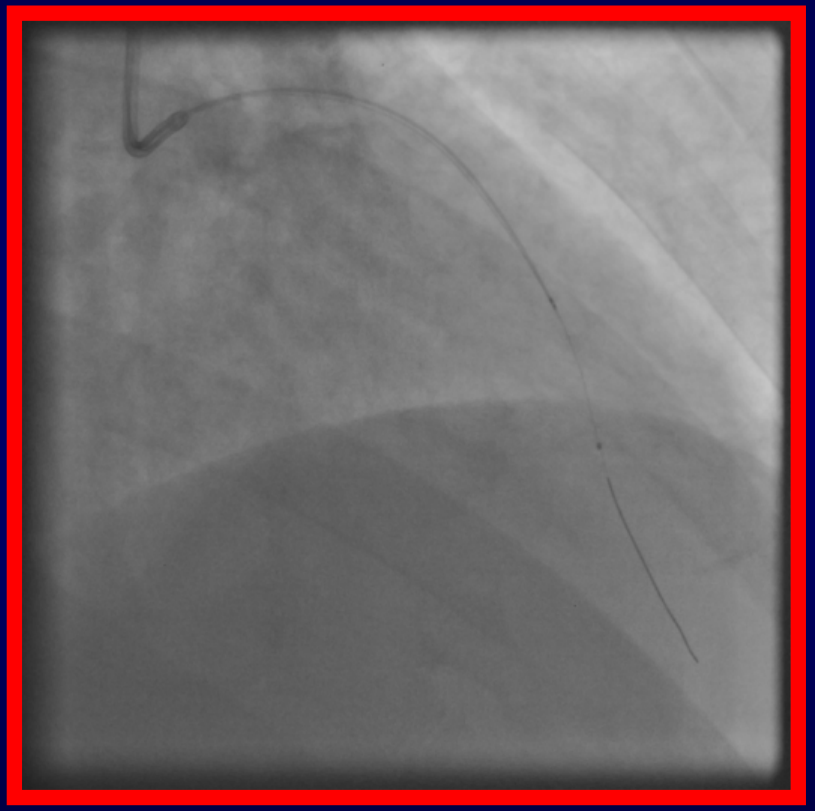




At first Glycoprotein IIb/IIIa receptor antagonist and heparin were IV injected.

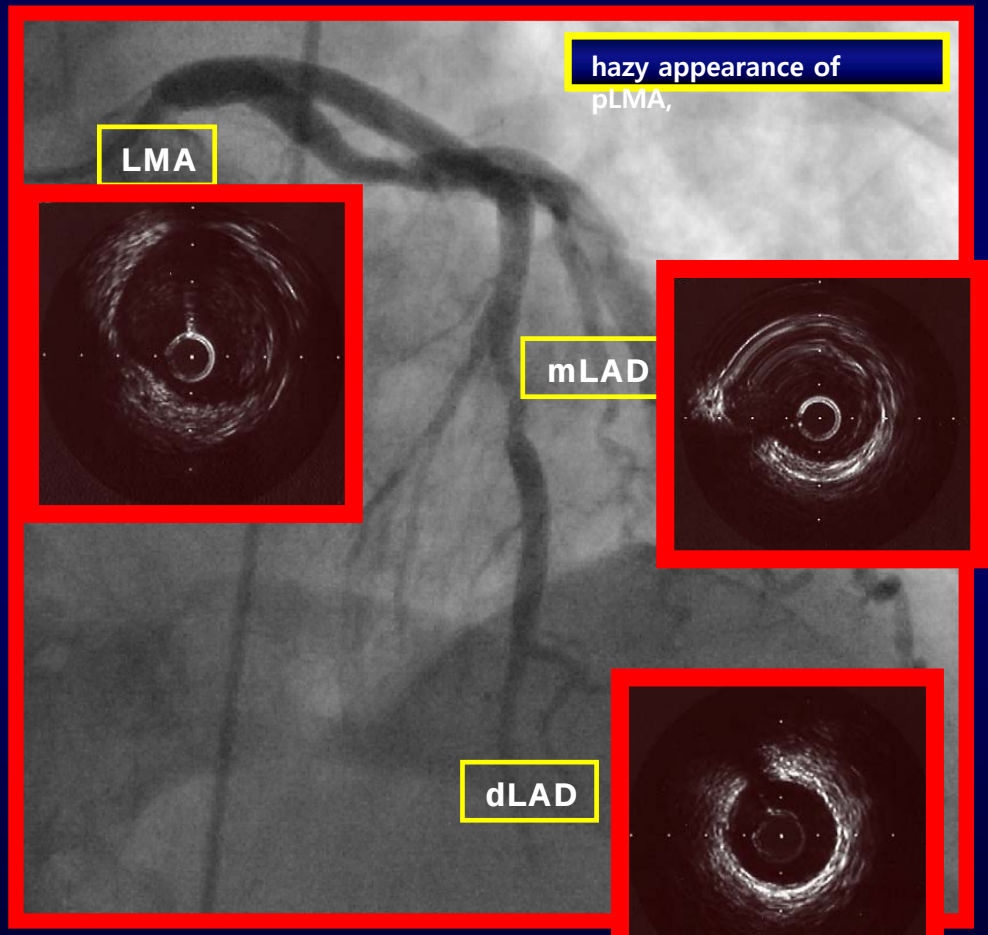
PCI for LMA lesion

After wiring & IVUS exam



7Fr Cordis XB 3.5 guiding catheter and
Route coronary guidewire

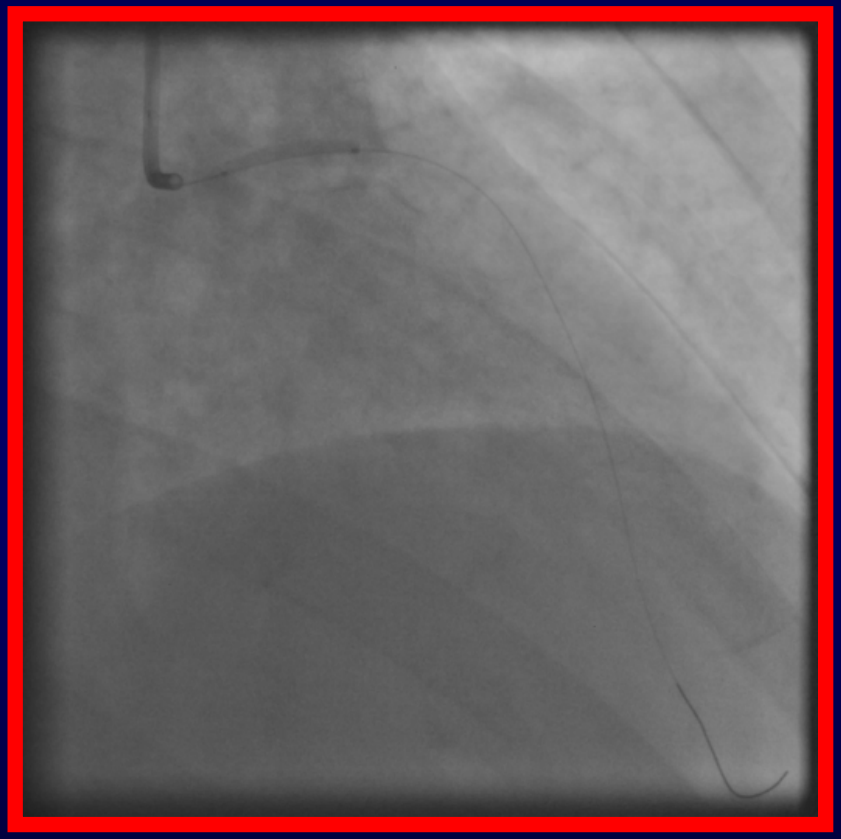
IVUS image



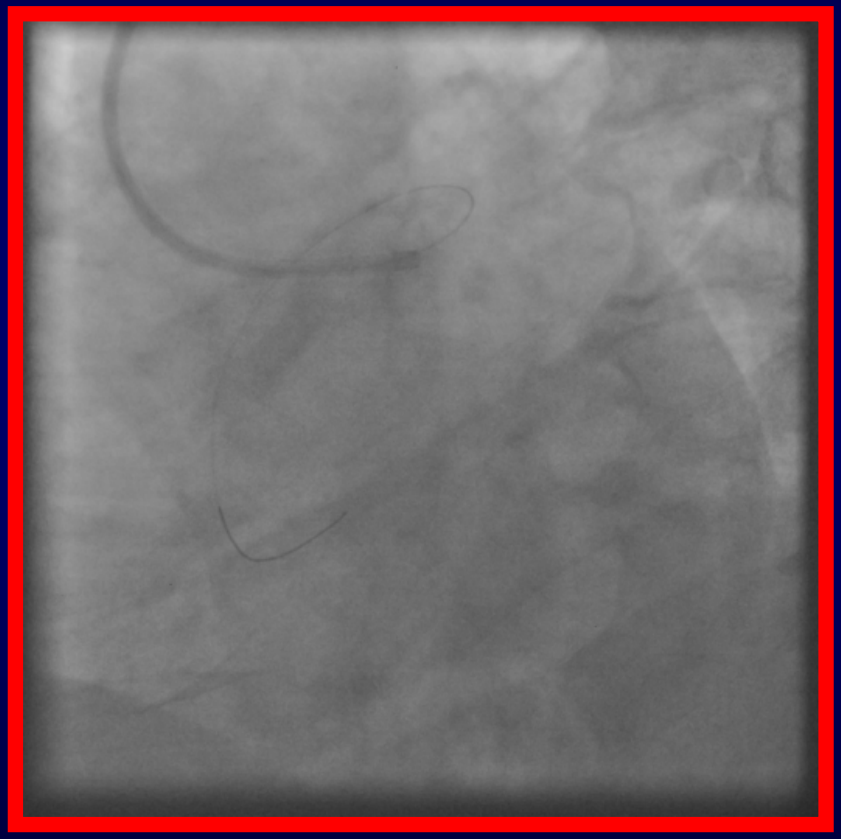
plaque rupture with embolization into

PCI for LMA lesion

Balloon dilatation



After Ballooning



Apollo 2.0x 20 mm balloon.

PCI for LMA lesion

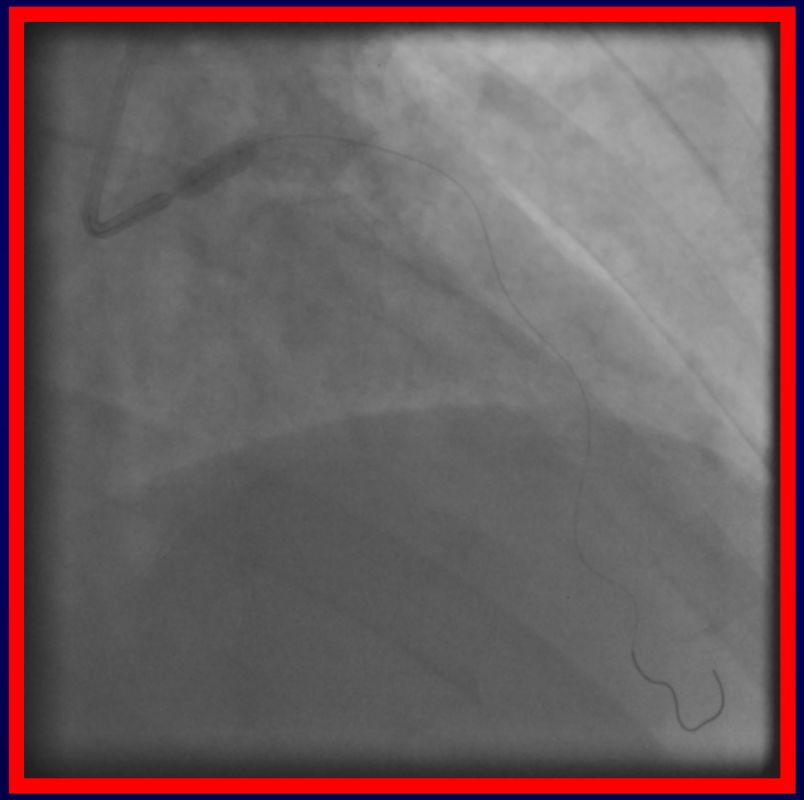
Stenting

Post-stenting

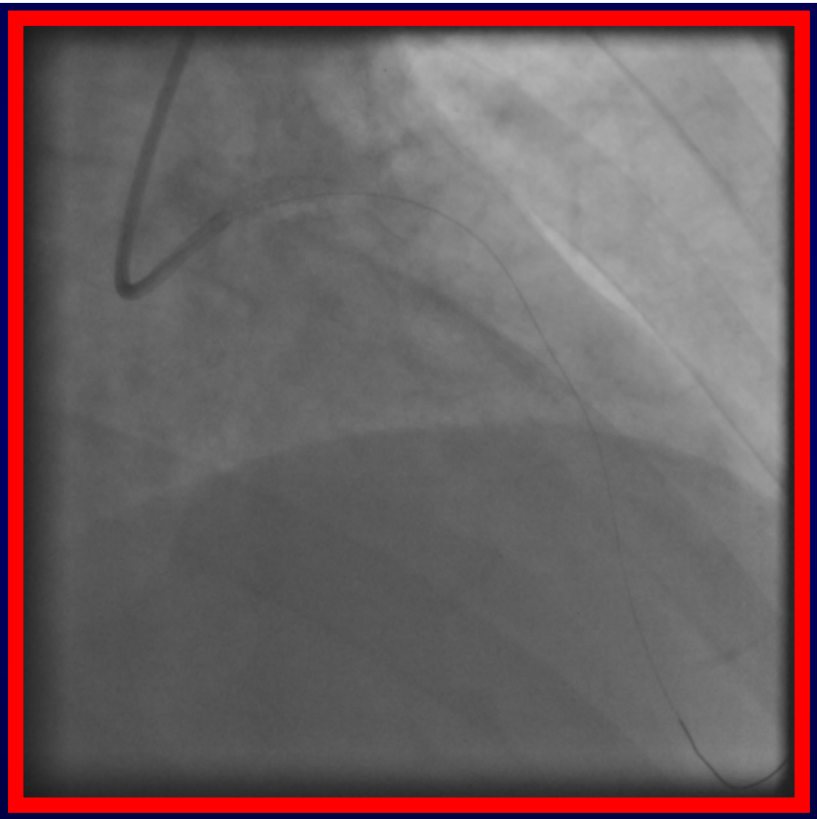
4.0x 16 mm PROMUS Element stent

PCI for LMA lesion

High pressure ballooning



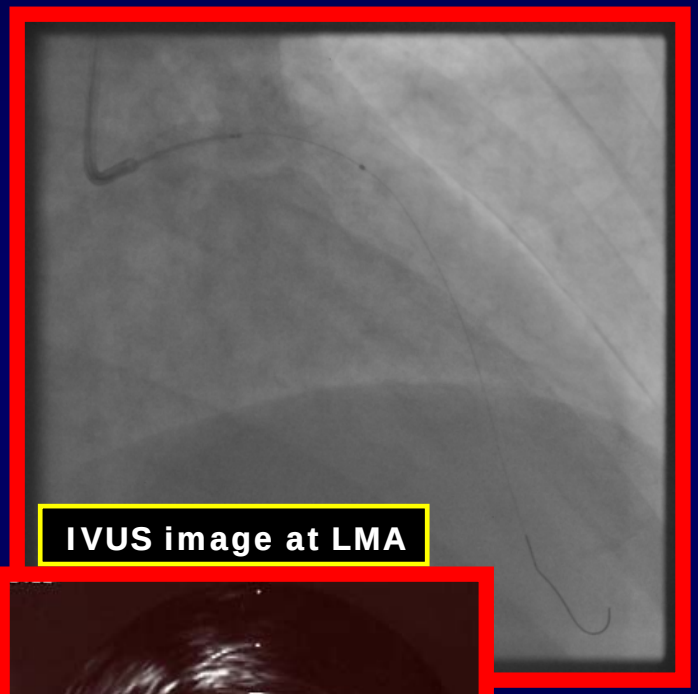
After high pressure ballooning



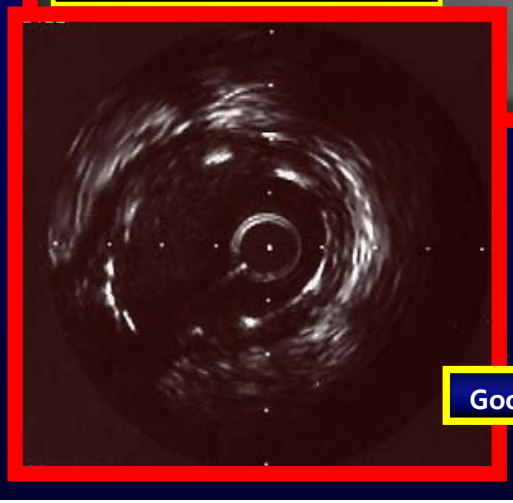
Apollo 4.0 x 10 mm

PCI for LMA & LAD lesion

IVUS exam after stenting

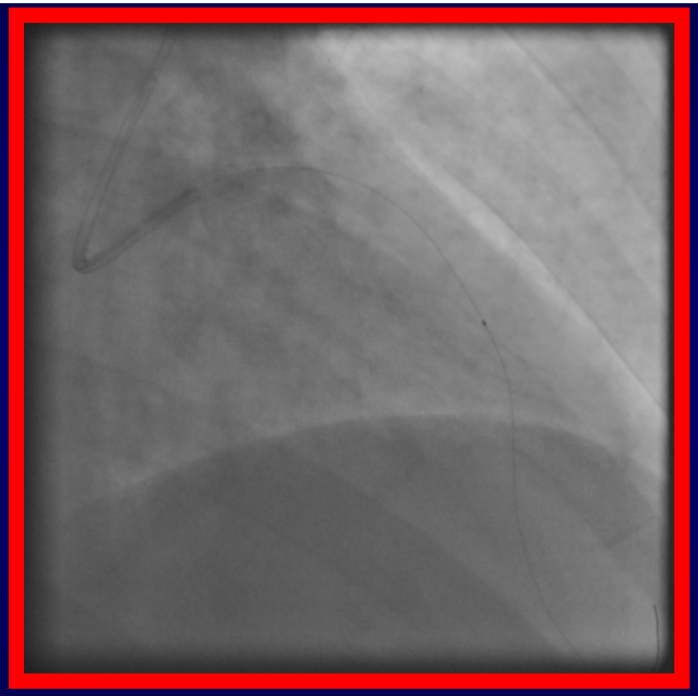


IVUS image at LMA



Good stent apposition in LMA

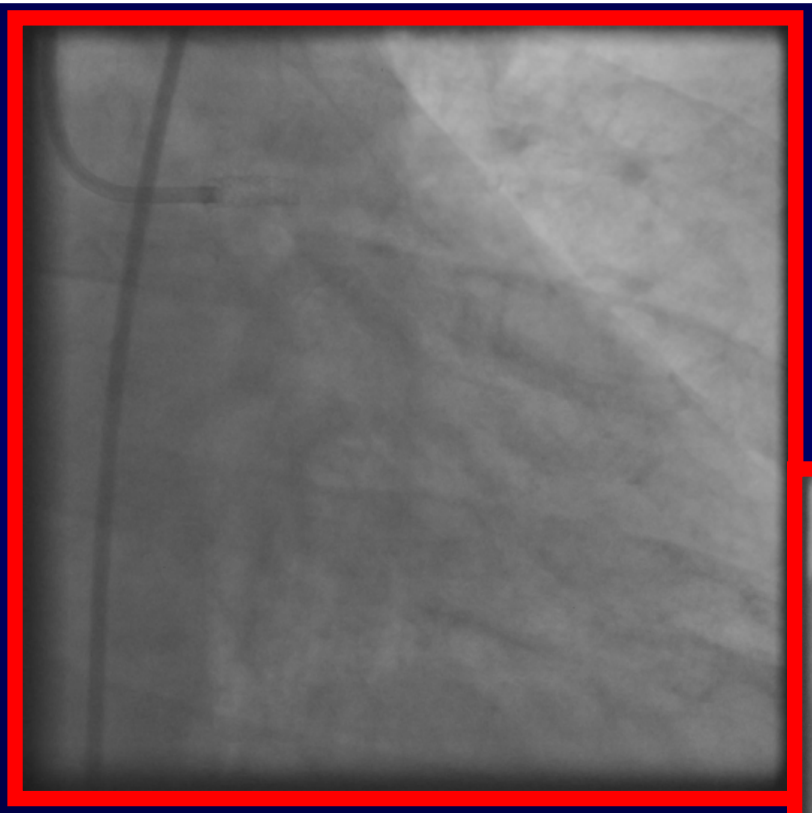
Aspiration at dLAD lesion



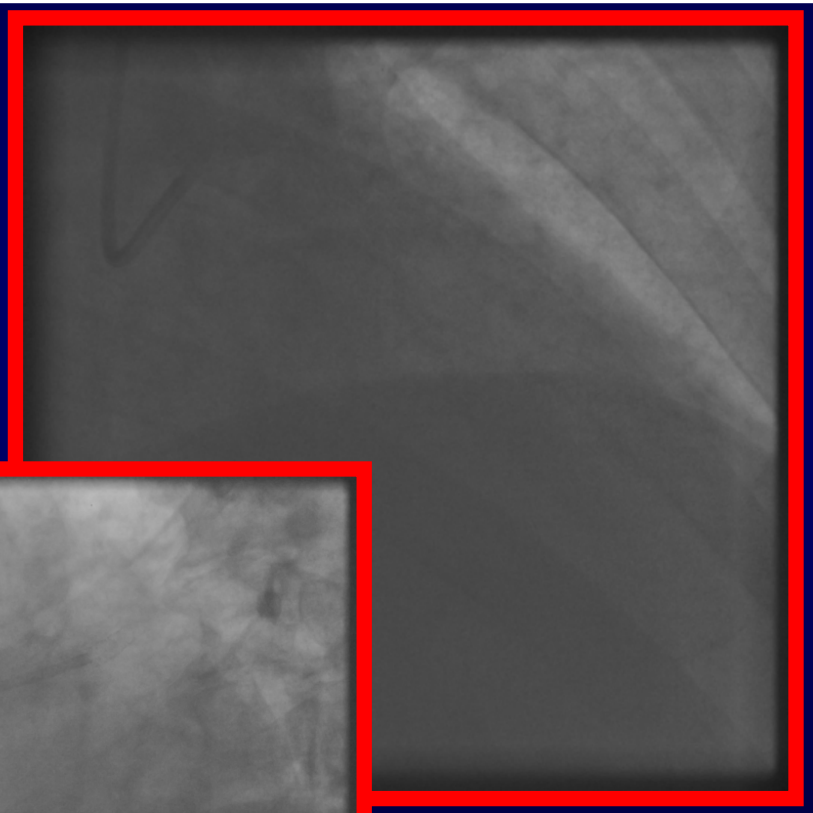
7F export catheter

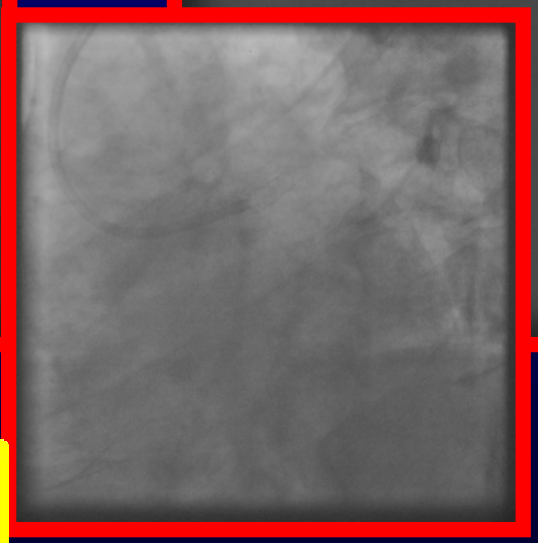
PCI for LMA & LAD lesion

Final Angiogram – RAO caudal



Final Angiogram – RAO cranial





TIMI 1 flow remained in dLAD

Remnant embolized thrombi of dLAD was planned to be treated medically by anti-platelet and anticoagulation agents.

some white thrombi were aspirated, TIMI3 flow was not achieved in dLAD.

Clinical course

Cardiac Marker:

Early peak suggesting adequate reperfusion therapy.

Working date(접수일):	2011 03/01 21:38	##	2011 03/01 04:27	##	2011 03/01 00:21	##
CK-MB [0.3~4(ng/ml)]	55.7	▲	17.9	▲	1.1	¤
Trop-I [0~0.1(ng/ml)]	15.96	▲	1.10	▲	0.01	¤
TP [6.4~8.5(g/dl)]		..	6.5	¤		-

Working date(접수일):	2011 03/04 06:37	##	2011 03/03 04:08	##	2011 03/02 03:26	##
CK-MB [0.3~4(ng/ml)]	1.9	¤	3.1	¤	23.3	▲
Trop-I [0~0.1(ng/ml)]	2.84	▲		-	9.12	▲

Hypercoaguability study

Lipo-A [0~30(mg/dl)]	34.7	▲		-
Homo-S [6.2~14.4(umol/l)]		..	27.90	▲
Lupus-Scr.	Negative			-
Pro-C Act [70~130(%)]	108	¤		-
Pro-C Ag [0.18~0.29(mg/dl)]	114.2	▲		-
Pro-S Act [77~143(%)]	65	▼		-
Pro-S Ag [1.35~2.40(mg/dl)]	93.1	▲		-
Pro-S F Ag [50~150(%)]	91.7	¤		-
D-Dimer [0~250.0(ng/ml)]		..	393	▲
Ant III [80~120(%)]		..	95	¤

Lipid profile:

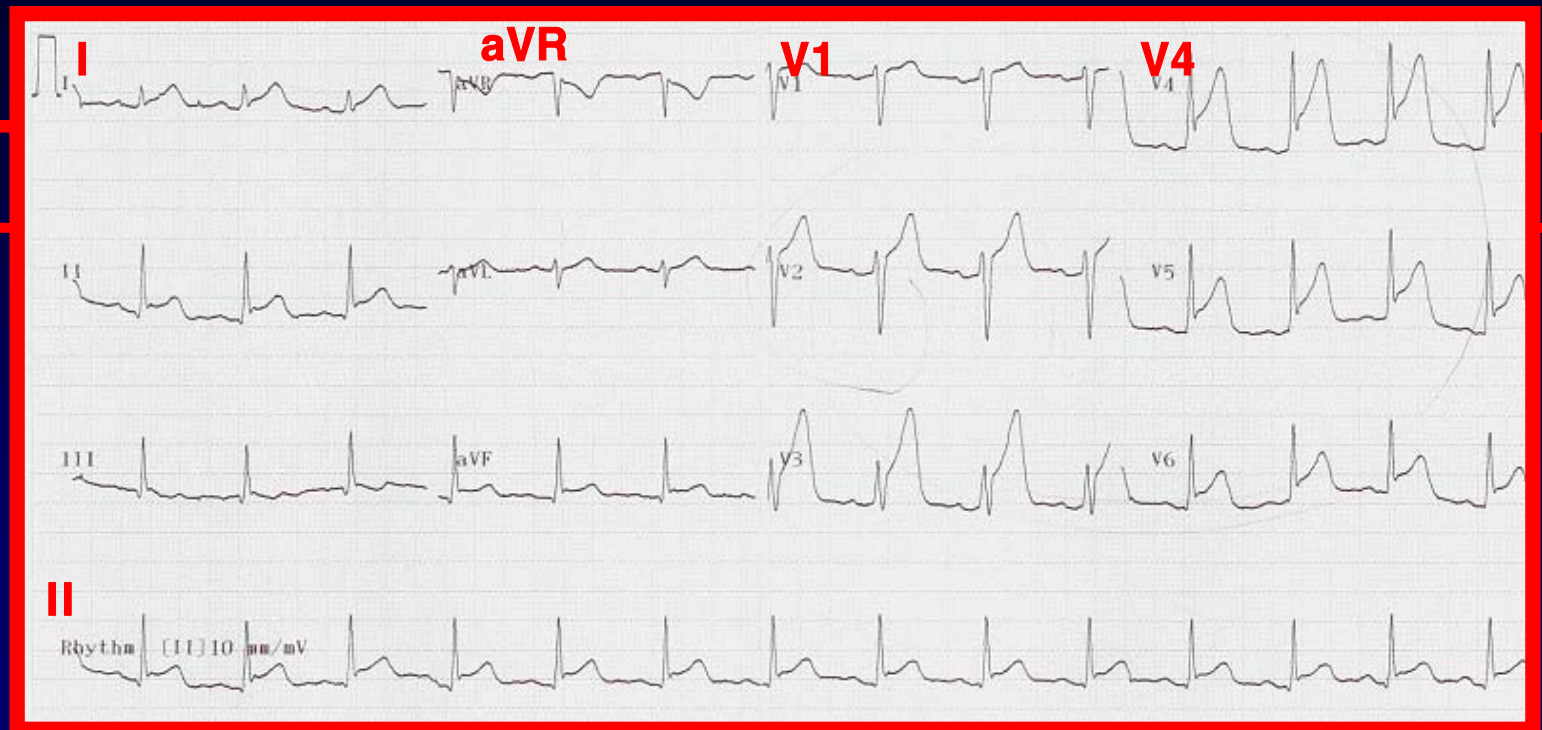
CHOL [130~250(mg/dl)]	283	▲
Glucose [60~110(mg/dl)]	124	▲
TG [60~150(mg/dl)]	123	¤
HDL [30~70(mg/dl)]	52	¤
LDL [0~120 이하(mg/dl)]	164	▲
HB A1c [4.4~6.4(%)]	6.5	▲

CRP-S [0.1~0.8(mg/dl)]	10.70	▲
HS_CRP [0~0.74(mg/dl)]	10.1000	▲
HBsAg	Negative(0.706)	

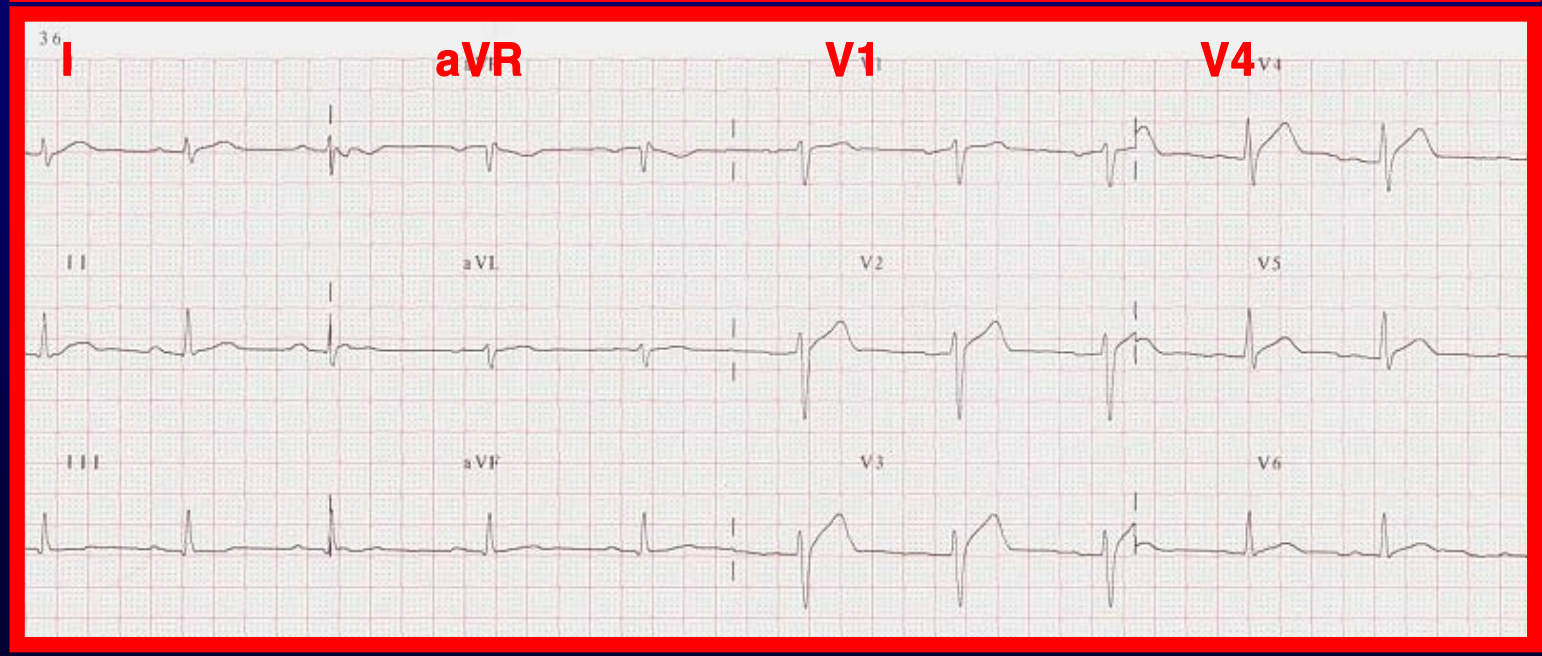
*Low risk of CVD : < 1.0
*Average risk of CVD : 1.0 ~ 3.0
*High risk of CVD : > 3.0

cardiovascular risk factors; smoker, HTN, DM, Hyperlipdemia., Homocyctein↑, lipoprotein A ↑, protein C activity ↓

Initial EKG

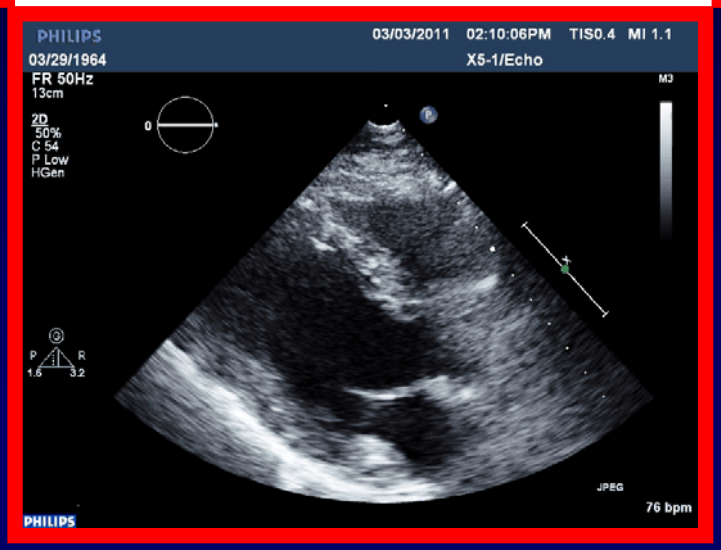


F/U EKG

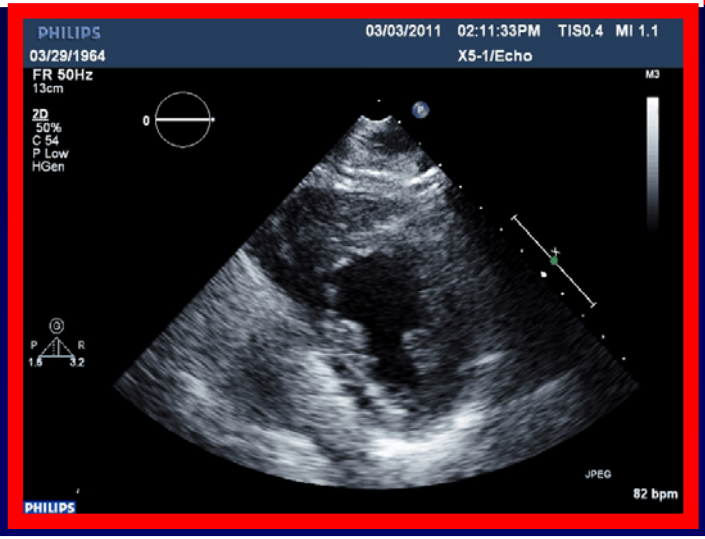


Transthoracic Echocardiography

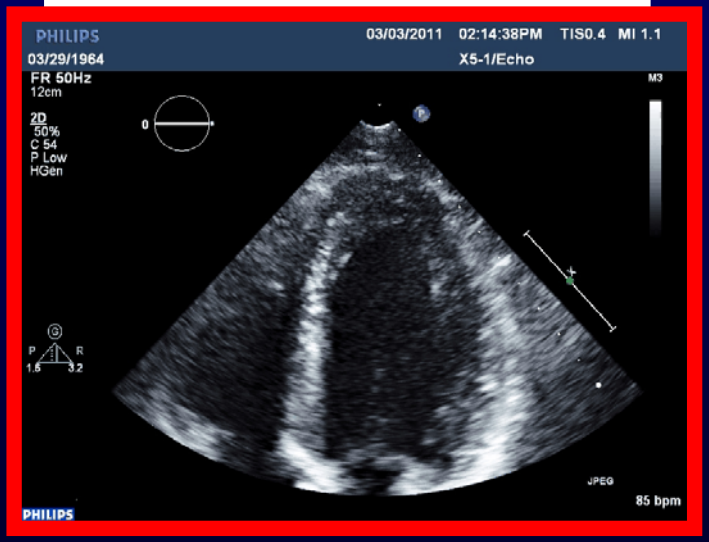
Parasternal long axis view



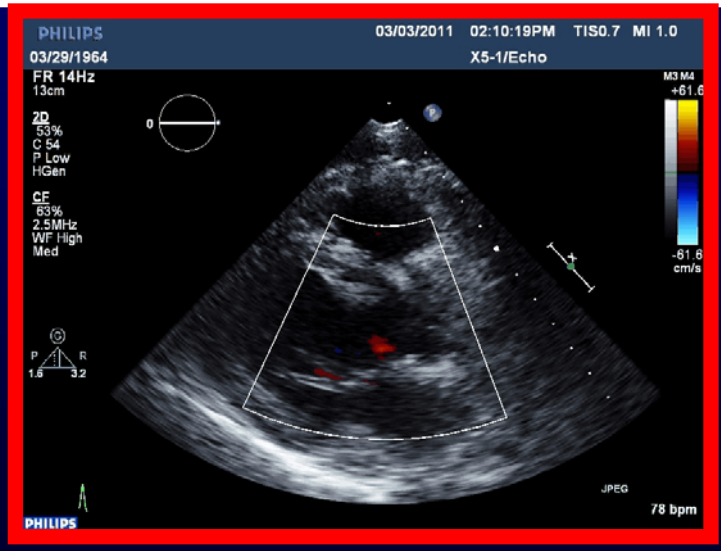
Parasternal short axis view



Apical 4-chamber view



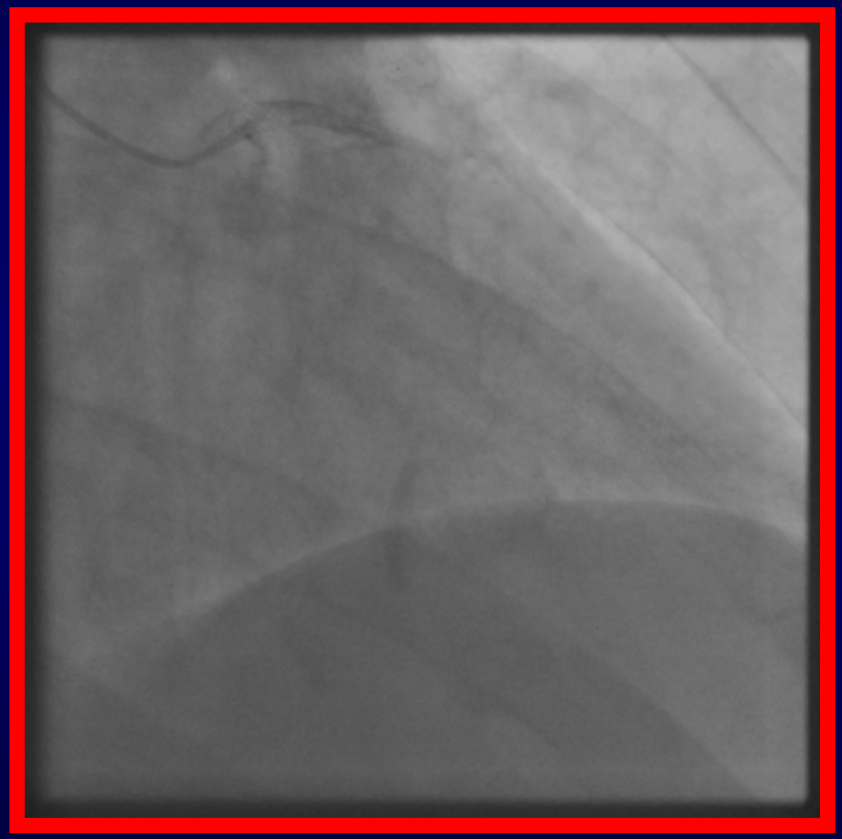
Subcostal view-Color



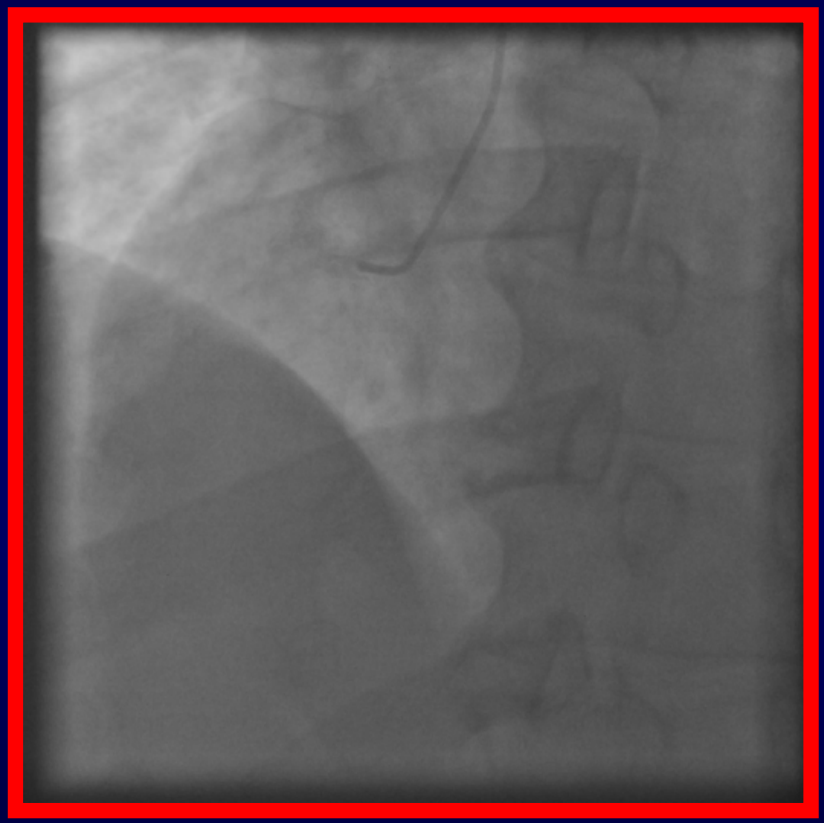
Follow up coronary angiogram;

After 3 days of subcutaneous LMWH injection

Left coronary artery



Right coronary artery



patency of dLAD; some filling defect

TIMI III flow in all coronary vascular beds .

Discharge med.; aspirin, clopidogrel, cilostazol, statin, b-blocker, ARB

Lesson(1); What is the best treatment to manage the STEMI caused by distal embolization of LMA thrombus?

No conclusive evidence & several case reports . According to the case reports, the treatment strategy is various.

Open Access

A Case of Acute Myocardial Infarction Caused by Distal Embolization of a Left Main Coronary Artery Thrombus

Kyung-Ryun Bae, MD, Young-Soo Lee, MD, Byong-Kyu Kim, MD, Geun-Ho Ha, MD
So-Yeon Kim, MD, Ji-Young Choi, MD and Kee-Sik Kim, MD
Division of Cardiology, Daegu Catholic University Medical Center, Da

1. Anticogulation medication

ABSTRACT

Coronary embolism is an uncommon cause of myocardial infarction. A 48-year-old male presented with typical c pain of an MI. There was no definite ST segment change on electrocardiogram (ECG) and no elevation of my cardial enzymes. Coronary angiography (CAG) revealed occlusion of the distal left anterior descending coronary artery (dLAD), the distal left circumflex coronary artery (dLCX), the diagonal branch (D) and the obtuse marginal branch (OM), with a large filling defect in the left main coronary artery (LMA) that caused the myocardial infarction. We considered the possibility that coronary embolization was caused by the migration of a thrombus in the LMA during CAG. We did balloon angioplasty in the dLAD, dLCX, OM and D and treated the patient with glycoprotein IIb/IIIa receptor antagonist. However, thrombi remained in the dLAD, OM, and dLCX. After 3 days of

A Case of Acute Myocardial Infarction Caused by Distal Embolization of a Left Main Coronary Artery Thrombus

We did balloon angioplasty in the dLAD, dLCX, OM and D and treated the patient with glycoprotein IIb/IIIa receptor antagonist. However, thrombi remained in the dLAD, OM, and dLCX. After 3 days of anti-thrombotic treatment, follow-up CAG revealed only slight resolution of thrombi in the LAD. After triple antiplatelet agent medication for 1 year, a follow-up CAG showed a resolution of the thrombi in all coronary arteries.

Treatment of a large left main coronary artery thrombus by aspiration thrombectomy

Petr Hajek · David Alan · Jiri Vejvoda · Katerina Linhartova · Petr Skapa · Zdenka Hajsmannova · Josef Veselka

2. Mechanical thrombus aspiration

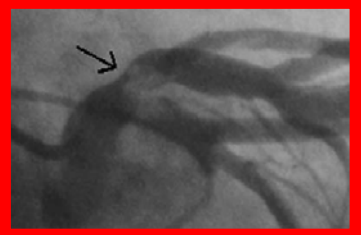
Published online:

the case of an acute left main coronary artery thrombosis leading to progressive deterioration of left ventricle function that was successfully treated with aspiration thrombectomy.

Abstract A left main coronary artery thrombosis is a life-threatening condition demanding immediate therapeutic management. Traditional treatment options include thrombolysis, percutaneous coronary intervention with stenting or cardiac bypass surgery. The num reported cases in which aspiration thrombectomy ha used is limited. Indications for this therapeutic ap are determined by coronary anatomy, clinical st and hemodynamic condition of the patient. We the case of an acute left main coronary artery thro leading to progressive deterioration of left v function that was successfully treated with asp thrombectomy.

Case report

A 64-year-old male, with a history



A Successful Management for Acute Thrombotic Myocardial Infarction with Abciximab in a Nephrotic Syndrome

Ok Young Park, MD, Myung Ho Jeong, MD, Young Wook Cho, MD, Sang Hyun Lee, MD, Du Sun Shim, MD, Bo Ra Yang, MD, Young Joon Hong, MD, Seung Hyun Lee, MD, Woo Suk Park, MD, Weon Kim, MD, Ju Han Kim, MD, Young Keun Ahn, MD, Jeong Gwan Cho, MD, Jong Chun Park, MD and Jung Chaee Kang, MD
The Heart Center of Chonnam National University Hospital, Chonnam National University Research Institute of Medical Sciences, Gwangju, Korea

ABSTRACT

A

A Successful Management for Acute Thrombotic Myocardial Infarction with Abciximab in a Nephrotic Syndrome

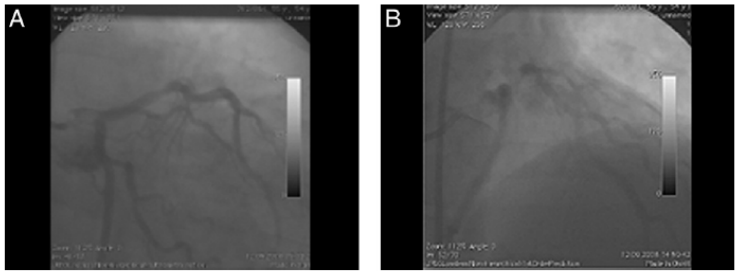
A rescue percutaneous coronary intervention was performed using repeated angioplasties with a 3.0 mm balloon. However, the filling defects and distal LAD flow did not improve. We administered Abciximab (ReoPro®), and the LAD flow improved to a TIMI III flow, with resolution of the thrombus in the LAD.

Lesson(1); What is the best treatment to manage the STEMI caused by distal embolization of LMA thrombus?

Acute Coronary Syndrome Caused by a Mobile Mass in the Left Main Coronary Artery

Baris Ikitimur, MD, Tevfik Gurmen, MD, Ali Tabakan, MD, F
Istanbul, Turkey

3.CABG



the Cardiology
rtment, Hizmet
ital, Istanbul, Turkey.
uscript received
ber 26, 2009;
pted November 5, 2009.

Intracoronary thrombi represent an important aspect of the pathophysiology of acute coronary syndromes. Their presentation and management differ depending on the clinical presentation. We present a case with an unusual angiographic presentation of a coronary thrombus in the left main coronary artery, which was managed with coronary artery bypass grafting. A 45-year-old male patient was admitted due to intermittent recent-onset chest pain

Acute Coronary Syndrome Caused by a Mobile Mass in the Left Main Coronary Artery

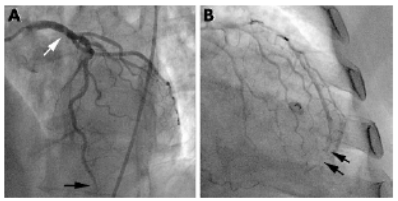
We present a case **with an unusual angiographic presentation of a coronary thrombus in the left main coronary artery, which was managed with coronary artery bypass grafting.**

Myocardial infarction caused by distal embolisation of a ruptured left main plaque

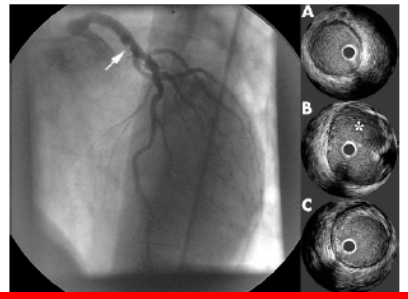
A 54-year-old man presented with a non-ST elevation myocardial infarction. Coronary angiography demonstrated a hazy appearance of the distal left main (LM) stem, and a thrombotic subtotal occlusion of the distal left anterior descending (LAD) artery with TIMI grade 1 flow (lower left pand, A, B). He was discharged following conservative management with antiplatelet treatment; however, he experienced ongoing exertional angina. Repeat angiography four weeks later demonstrated an ulcerated plaque in the distal LM stem, and a patent LAD with normal antegrade flow. There was no angiographic disease at the site of previous occlusion. Intravascular ultrasound (IVUS) was performed demonstrating a large perforated plaque in the distal LM (upper right panel, A–C). Blood speckle was seen within the plaque, suggesting a recent plaque rupture with embolisation of its contents. It was felt the ruptured plaque may provide a substrate for further thrombotic and/or embolic events. Percutaneous coronary intervention was performed with a 5.0 × 20 mm Taxus stent (Boston Scientific, Massachusetts, USA) deployed in the distal LM and proximal LAD achieving an excellent angiographic and IVUS result (lower right panel, A–C).

Rupture of an atheromatous plaque may cause localised thrombus formation at the site of plaque rupture. Alternatively, as demonstrated in this case, thrombus may embolise causing coronary occlusion downstream in the dependent vascular territory. When investigating patients with acute coronary syndromes the possibility of downstream embolisation from proximal plaque disease should be considered. Further development of technology able to target lipid-rich vulnerable plaque may have a role in predicting plaque rupture and acute cardiac ischaemia.

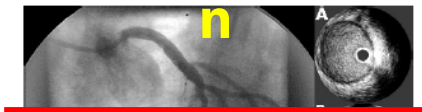
W J van Gaal
N West
A P Banning
william@vangaal.org



(A) Left anterior oblique cranial view demonstrating distal occlusion of the left anterior descending artery (LAD) (black arrow). There is a hazy appearance of the distal left main (LM) (white arrow). (B) Right anterior oblique caudal projection showing a filling defect in the distal LAD attributed to thrombus (double arrow).



4. Stent implantation



Myocardial infarction caused by distal embolisation of a ruptured left main plaque.

PCI was performed with a 5.0 X 20 mm Taxus stent deployed in the distal LM and proximal LAD achieving an excellent angiographic and IVUS result. When investigating patients with **acute coronary syndromes the possibility of downstream embolisation from proximal plaque disease** should be considered.

Appropriate treatment of STEMI caused by distal embolization of LMA thrombus remains a therapeutic challenge. Considering the coronary anatomy, clinical stability and the hemodynamic condition, we have to choose the most effective treatment modality ; anticogulation medication, mechanical thrombus aspiration, stent implantation and CABG.

Lesson 2; If the TIMI III flow is not achieved, how do we plan for better treatment outcome?

1. A Successful Management for Acute Thrombotic Myocardial Infarction with Abciximab in a Nephrotic Syndrome

Accelerated tissue type plasminogen activator (100 mg) was administered at the emergency room, but his chest pain continued, with persistent ST segment elevations. An urgent coronary angiograph revealed huge multiple filling defects, suggestive of thrombi in the proximal left anterior descending artery (LAD), with thrombolysis in the myocardial infarction (TIMI) flow. A rescue percutaneous coronary intervention was performed using repeated angioplasties with a 3.0 mm balloon. However, the filling defects and distal LAD flow did not improve. We administered Abciximab (ReoPro®), and the LAD flow improved to a TIMI III flow, with resolution of the thrombus in the LAD. His clinical course was uneventful after discharge, and a left coronary angiogram, at the 6-month follow up, showed no filling defects, with the TIMI III flow maintained.

How to achieve the TIMI III flow at distal embolized vessel

2. A Case of Successful Primary Coronary Intervention for the Total Occlusion of Left Main Stem with the Aid of Abciximab J Korean Med Sci 2001; 16: 509-11

We performed direct coronary intervention using kissing balloon technique with the aid of Abciximab infusion. Residual stenosis with thrombus remained even after high pressure balloon dilatations, therefore we placed two stents, one in the ostia of left anterior descending (LAD) and the other in left circumflex artery (LCX). Coronary angiogram after kissing stents showed improved LAD and LCX flows without residual stenosis. Follow-up coronary angiogram taken one week later showed patent previous stented arteries.

Lesson 2; If the TIMI III flow is not achieved, how do we plan for better treatment outcome?

1. How long will be anticoagulation therapy administrated?

A Case of Acute Myocardial Infarction Caused by Distal Embolization of a Left Main Coronary Artery Thrombus. Bae et al. Korean Circ J 2010;40:46-49

We considered the possibility that coronary embolization was caused by the migration of a thrombus in the LMA during CAG. We did balloon angioplasty in the dLAD, dLCX, OM and D and treated the patient with glycoprotein IIb/IIIa receptor antagonist. However, thrombi remained in the dLAD, OM, and dLCX. After 3 days of anti-thrombotic treatment, follow-up CAG revealed only slight resolution of thrombi in the LAD. After triple antiplatelet agent medication for 1 year, a follow-up CAG showed a resolution of the thrombi in all coronary arteries.

In previous 2 cases , TIMI 3 flow was achieved at distal embolized vessel but in our case was not achieved. Is our treatment inadequate ?

2. Which is the best drug?

Resolution of a coronary embolus by intravenous application of bivalirudin. Steinwender et. al. Int J Card 2009;132:e115–e116

Due to the fact that the angiographically confirmed embolus did not resolve within 4 days of treatment with aspirin, clopidogrel and low molecular weight heparin (LMWH), we intravenously administered bivalirudin instead of LMWH for another 2 days and could demonstrate complete resolution of the embolus following this protocol. No bleeding complications or recurrence of myocardial ischemia occurred.

If the TIMI 3 flow is not achieved, adequate antithrombotic therapy must be prescribed and follow up CAG may be considered to change the treatment method in embolized vessel.

Take home message

There are various strategies to treat the AMI caused by distal embolization of LMA thrombus such as anticogulation medical therapy, mechanical thrombus aspiration, stent implantation and CABG.

Which is the best treatment?

- These various treatment strategies have both merits and demerits.
- There is no reliable evidence which is the most effective therapy.
- It is not clear what is the routine treatment of LMA thrombus.

In my opinion, I suggest that the one of the best treatment options is stent implantation at LMA and anticoagulation therapy at distal embolized vessel lesion.