



**PHILIPS**

Interventional Cardiology

AlluraClarity

# Making the difference with Live Image Guidance

Diagnosis and treatment of coronary artery diseases and atherosclerosis

## Where/who

The First Bethune Hospital of Jilin University (Second Campus), Jilin, China

Prof. Guangzhu Lin, MD, PhD, deputy director of cardiology department and associate professor.

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## Challenge

Reducing radiation dose without comprising clinical image quality.

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## Solution

Philips AlluraClarity system provides equivalent image quality at 50% X-ray dose reduction without any change in how procedures are conducted.

First Bethune Hospital is a level three, top tier research and medical teaching hospital (Chinese national hospital ranking system). As the largest public teaching hospital in China's Jilin Province, this hospital has been shaping the development of the medical field in China for over half a century. It serves a patient population estimated at three million people.

These cases were performed by Prof. Guangzhu Lin, MD, PhD, Deputy Director of Cardiology Department and Associate Professor at the First Bethune Hospital of Jilin University (Second Campus) in Jilin, China.



## AlluraClarity – reduce radiation while maintaining excellent image quality

The Cardiology Department at this hospital is a national key clinical department, which conducts clinical work, academic teaching, and research. There are about 40 staff members in the department, including clinical physicians, interventional physicians, nurses, and technicians.

This department performs an average of 800 interventional diagnostic and treatment procedures a year on mainly adult and elderly patients. They are committed to reducing radiation dose as much as possible during these procedures to enhance the health of staff and patients. To further reduce radiation for their cardiology procedures, the hospital recently added the Philips AlluraClarity interventional X-ray system to the Cardiology Department. The AlluraClarity family of X-ray systems with ClarityIQ technology delivers superb image quality at 50% dose reduction, helping to minimize patient and staff exposure. It helps medical staff manage low dose levels to see what they must, without changing the way they work.

Prof. Guangzhu Lin, MD, PhD, deputy director of cardiology department and associate professor has been working with the AlluraClarity for a few months and sees several advantages of using it. "The main advantage is radiation dose reduction. For interventional cardiology, it satisfies the clinical requirement of reducing radiation without compromising the clinical image quality."

### Up to 50% less X-ray dose for therapeutic interventions

The Cardiology Department has reduced dose rates for both diagnostic and therapeutic interventions drastically. Prof. Lin says, "At the moment, we use 25% of the regular dose setting for diagnostic coronary angiograms and 50% of the regular dose setting for therapeutic interventions. The image quality from both settings meets clinical requirements." For diagnostics, the team uses the lowest dose levels since this provides sufficient image quality to make a proper diagnosis. The team uses the 50% dose reduced settings for interventions to be absolutely certain that they obtain the best possible image quality to place the device. The team believes that with more experience with the low dose settings of the diagnostic procedures, they may be able to use the same low dose setting for the therapeutic procedures as well.

Maintaining image quality at lower dose settings is especially important for procedures on obese patients and bifurcation lesions, and Prof. Lin is satisfied with the results provided by the AlluraClarity for these procedures.

For more information about Philips AlluraClarity, please visit [www.philips.com/AlluraClarity](http://www.philips.com/AlluraClarity)



"There is a clear reduction in radiation without any change in how procedures are conducted. It provides important care for the physical and mental health of both the medical staff and patients."

**Prof. Guangzhu Lin, MD, PhD, deputy director**

# PCI

## Angiography results

LM: no obvious stenosis

LAD: up to 50% diffuse stenosis in proximal segment.

Mid segment is occluded, forward blood flow at TIMI grade 0.

Up to 70% diffuse stenosis in D2 proximal segment, forward blood flow at TIMI grade 3

LCX: up to 30% diffuse stenosis in proximal segment, forward blood flow at TIMI grade 3

RCA: up to 40% diffuse stenosis in mid segment, forward blood flow at TIMI grade 3

Collateral circulation: no

Dominant coronary artery: right

## Procedural notes

**Angiography:** Trans-radial access on right arm with 6F artery sheath.  
3000 units of Heparin – at beginning and end of angiography

**Treatment strategy:** Based on angio results, next steps were discussed with patient's family. The family declined a coronary bypass operation. After consulting with other experts, physician planned to do a PCI in the LAD

**LAD PCI:** Balloon dilatation (12 atm) in the mid-distal segment of the artery.  
Distal end: Tivoli 2.5\* 35 mm stent implantation. Mid segment: Tivoli 2.5\* 25 mm stent implantation. Balloon expansion (16 atm) at the overlapped ends of the stents.  
Angiography showed good lumen attachment of the stents and no remaining stenosis.  
Forward blood flow at TIMI grade 3.

## End of procedure

The patient was stable after the procedure, and returned to the ward.

## Case 1

Patient:

**64 year-old female**

Diagnosis during procedure:

**LAD occlusion**

Pre-op diagnosis:

**Coronary heart disease**

Planned procedure:

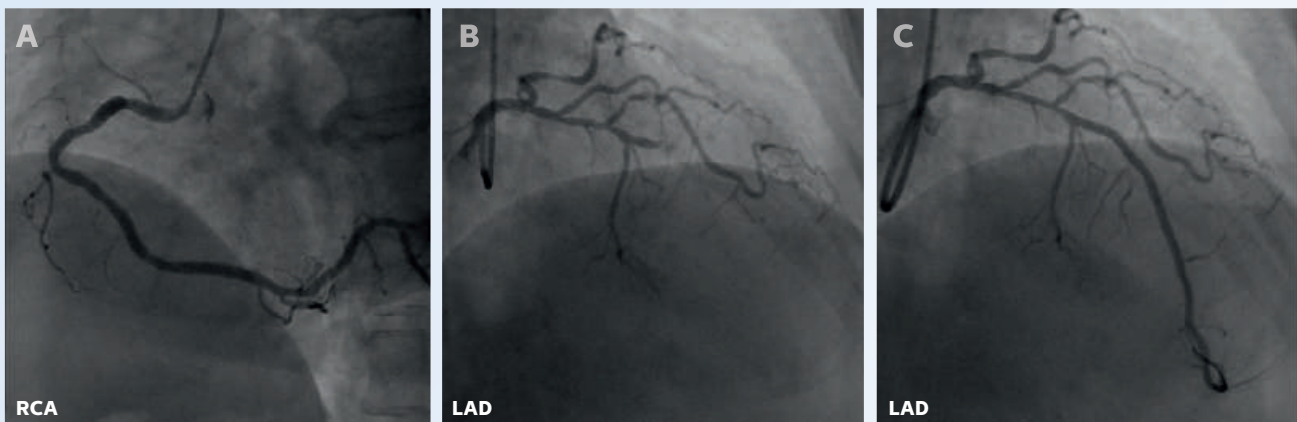
**Coronary angiography**

Executed procedure:

**Coronary angiography and  
coronary stent implantation**

Anesthesia:

**Local**



**25% of the regular dose used to clearly visualize the total occlusion in mid segment LAD and a stenosis on the proximal D2 (image A & B). Excellent visualization of the stent of 50% of the regular dose (image C).**



# PCI

## Case 2

Patient:

**55 year-old female**

Diagnosis during procedure:

**LAD, LCX, RCA stenosis**

Pre-op diagnosis:

**Non ST elevated myocardial infarction**

Planned procedure:

**Coronary angiography**

Executed procedure:

**Coronary angiography and coronary stent implantation**

Anesthesia:

**Local**

### Angiography results

LM: no obvious stenosis

LAD: up to 90% diffuse stenosis in proximal mid segment. 70% stenosis in D1 ostium, 90% stenosis in D2 ostium and proximal end segment, forward blood flow at TIMI grade 3

LCX: up to 90% diffuse stenosis in proximal segment, forward blood flow at TIMI grade 3

RCA: 20% to 30% diffuse stenosis in proximal mid segment. Up to 80% diffuse stenosis in posterior descending artery, forward blood flow at TIMI grade 3

Collateral circulation: no

Dominant coronary artery: right

### Procedural notes

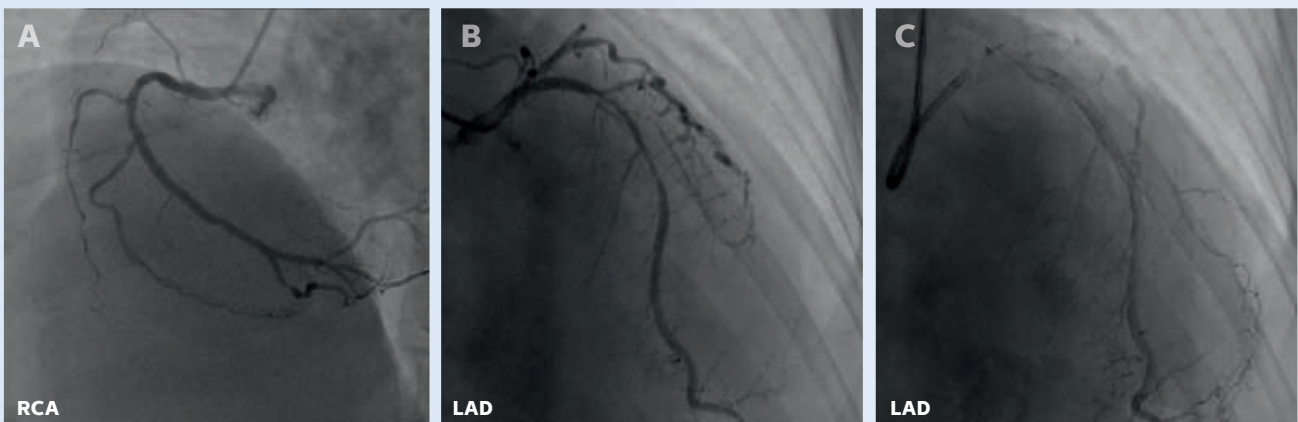
**Angiography:** Trans-radial access on right arm with 6F artery sheath. 3000 units of Heparin – at beginning and end of angiography.

**Treatment strategy:** Based on angio results, next steps were discussed with patient's family. The family declined a coronary bypass operation. After consulting with other experts, physician planned to do a PCI in the LAD.

**LAD PCI:** Balloon dilatation (12 atm) in the mid segment of the artery. Mid segment: Tivoli 3.0\* 35 mm stent implantation. Proximal mid segment: Tivoli 3.5\* 15 mm stent implantation. Closure of D1 and D2 was shown. It still did not open up after guidewire attempts. Angiography showed poor lumen attachment of the stents. Balloon dilatation (16 atm) in the stent. Angiography showed good attachment of the stents, no remaining stenosis, and forward blood flow at TIMI grade 3.

### End of procedure

The patient was stable after the procedure, and returned to the ward.



**With 25% of the regular dose, the branch of the lesion can be accurately assessed (image A & B). Excellent visualization of the stent at 50% of the regular dose (image C).**

# PCI

## Angiography results

LM: no obvious stenosis

LAD: proximal segment occluded, forward blood flow at TIMI grade 0. 60% stenosis in D1 ostium, forward blood flow at TIMI grade 3

LCX: up to 30% diffuse stenosis in OM2 mid segment, forward blood flow at TIMI grade 3

RCA: 30% diffuse stenosis in mid segment. Forward blood flow at TIMI grade 3

Collateral circulation: no

Dominant coronary artery: right

## Procedural notes

**Angiography:** Trans-radial access on right arm with 6F artery sheath. 3000 units of Heparin – at beginning and end of angiography

**Treatment strategy:** Based on angio results, next steps were discussed with patient's family. The family declined a coronary bypass operation. After consulting with other experts, physician planned to do a PCI in the LAD

**LAD PCI:** Applied suctions using thrombosuction catheter at the lesion. A few dark red thrombi were taken out. Balloon dilatation (12 atm) in the mid segment of the artery. Mid segment: Tivoli 2.5\* 21 mm stent implantation. Proximal mid segment: Tivoli 3.5\* 21 mm stent implantation. Angiography showed poor lumen attachment of the stent. Balloon dilatation (18 ATM) in the stent. Angiography showed good lumen attachment of the stent, no remaining stenosis, and forward blood flow at TIMI grade 3. End of procedure.

## End of procedure

The patient was stable after the procedure, and returned to the ward

## Case 3

Patient:

**65 year-old male**

Diagnosis during procedure:

**LAD occlusion**

Pre-op diagnosis:

**Acute anterior wall myocardial infarction**

Planned procedure:

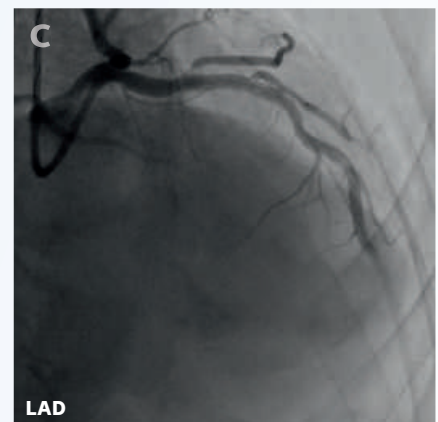
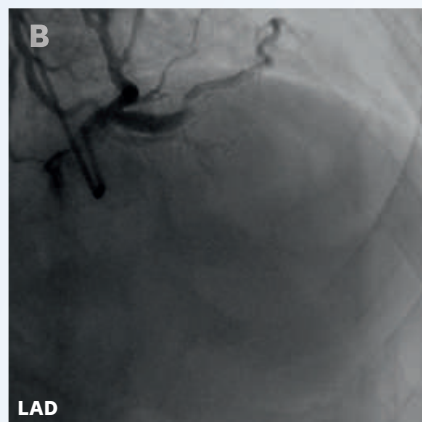
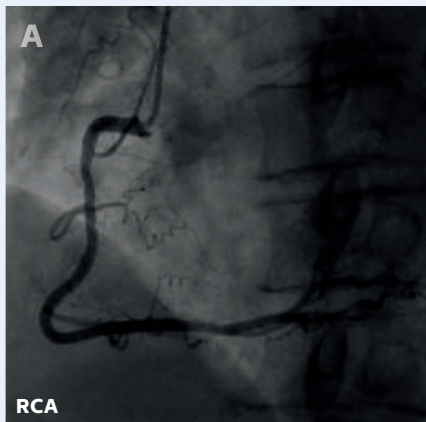
**Coronary angiography**

Executed procedure:

**Coronary angiography and coronary stent implantation**

Anesthesia:

**Local**



**With 25% of the regular dose, the lesion can be accurately assessed (image A & B). With 50% of the regular dose, the intervention is preformed (image C).**

# Diagnostic Angiography

## Case 4

Patient:  
**50 year-old male**

Diagnosis during procedure:  
**D1 occlusion, LAD, LCX,  
RCA stenosis**

Planned procedure:  
**Coronary angiography**

Executed procedure:  
**Coronary angiography**

Anesthesia:  
**Local**

### Angiography results

LM: no obvious stenosis

LAD: 30% diffuse stenosis in mid segment, forward blood flow at TIMI grade 3. Could see myocardial bridge in mid segment. D1 occlusion, forward blood flow at TIMI grade 0

LCX: 20% diffuse stenosis in proximal mid segment, forward blood flow at TIMI grade 3

RCA: Could see shadow of plaque in mid segment, forward blood flow at TIMI grade 3

Collateral circulation: no

Dominant coronary artery: right

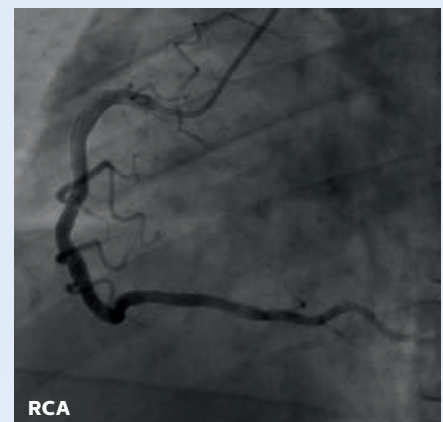
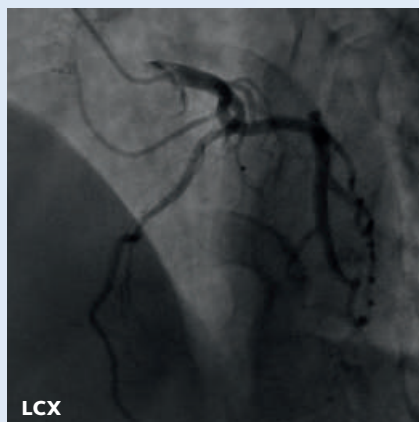
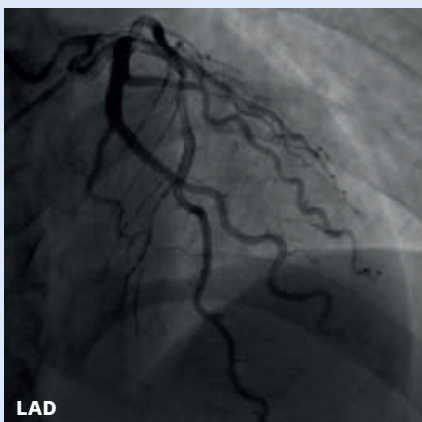
### Procedural notes

**Angiography:** Trans-radial access on right arm with 6F artery sheath. 3000 units of Heparin – at beginning and end of angiography

**Treatment strategy:** Based on angio results and after consulting with experts, the physician proposed to the patient and family to do an interventional treatment to D1. This was declined by the family.

### End of procedure

The patient was stable after the procedure, and returned to the ward.



**With 25% of the regular dose, the diagnostics was completed.**

# Diagnostic Angiography

## Angiography results

LM: no obvious stenosis

LAD: 60% stenosis in proximal segment. Could see myocardial bridge in mid segment, forward blood flow at TIMI grade 3

LCX: 60% stenosis at most severe point in OM1 proximal segment, forward blood flow at TIMI grade 3

RCA: the vessel lumen was not smooth. Could see shadow of plaque. 60% stenosis at most severe point in PDA. Forward blood flow at TIMI grade 3  
Collateral circulation: no  
Dominant coronary artery: right

## Procedural notes

**Angiography:** Trans-radial access on right arm with 6F artery sheath. 3000 units of Heparin – at beginning and end of angiography

**Treatment strategy:** Based on angio results, no indication for PCI.

## End of procedure

The patient was stable after the procedure, and returned to the ward.

## Case 5

Patient:

**59 year-old male**

Diagnosis during procedure:

**LAD, OM1, PDA stenosis**

Planned procedure:

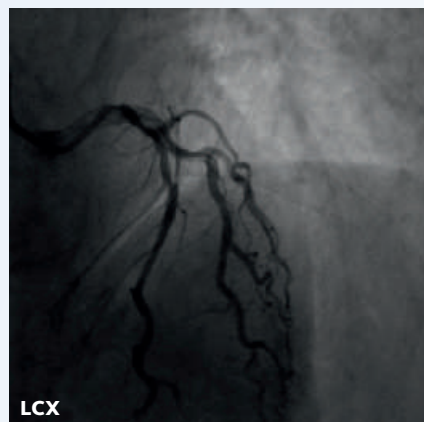
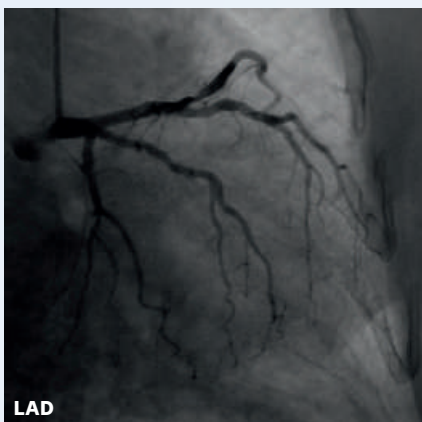
**Coronary angiography**

Executed procedure:

**Coronary angiography**

Anesthesia:

**Local**



With 25% of the regular dose, the decision not to continue with the intervention could be taken.



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