

Two Cases of Trifurcated LM Lesion Treated by Double Mini-Crush Technique

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Tsukuba Memorial Hospital**

Disclosure Statement of Financial Interest

I, Kenji Wagatsuma DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation

Case 1

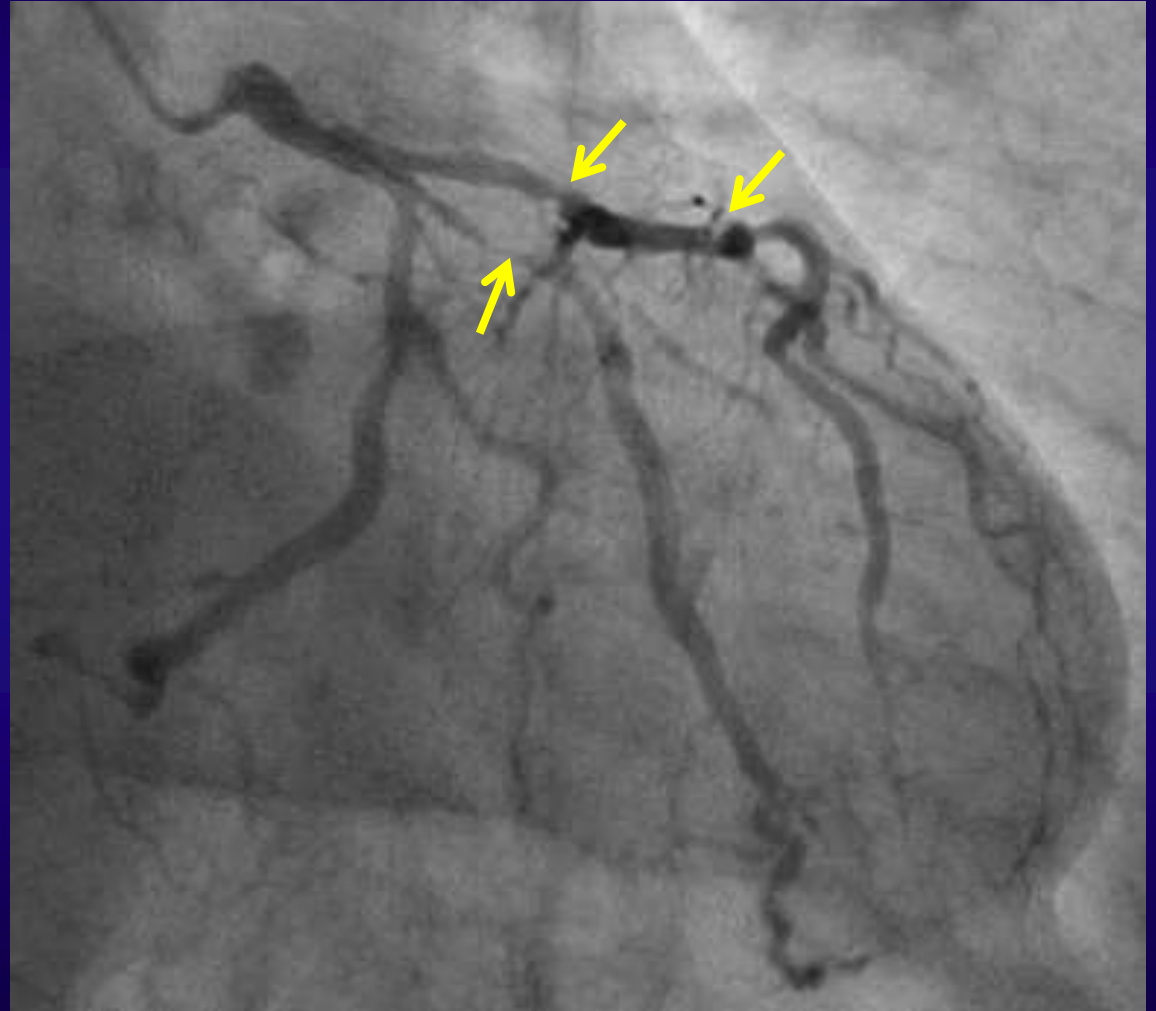
【Case】 71-year-old male

【Case history】 He presented to our hospital for the left shoulder pain on February 2013. The CAG revealed severe stenosis of LAD #6, #8 and the Intermediate branch(IM). These three lesions were treated with DES.

He was admitted for the recurrence of angina, and underwent emergency CABG (LITA-LAD, SVG-IM, SVG-LCx) on May 11. Then, he made good progress.

But he was admitted again for ACS and acute pulmonary edema.

2/23/2013 UAP



2/23/2013 UAP

#6 3.0/9mm Integrity
#8 2.5/12mm Integrity
IM 2.5/14mm Integrity



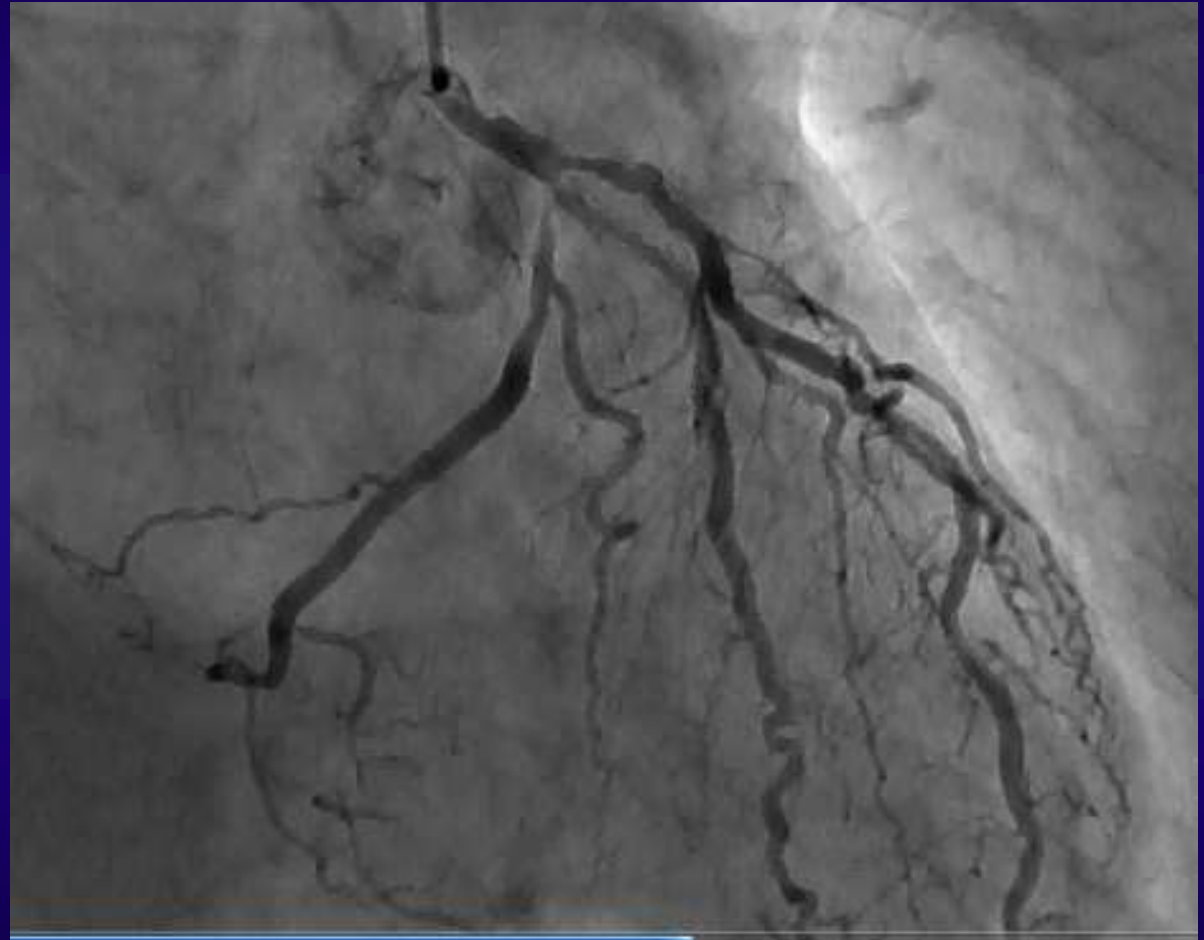
5/10/2013 Recurrent UAP

Emergent
CABG

LITA-LAD

SVG-IM

SVG-LCx



Case: Trifurcation LM lesion

Case

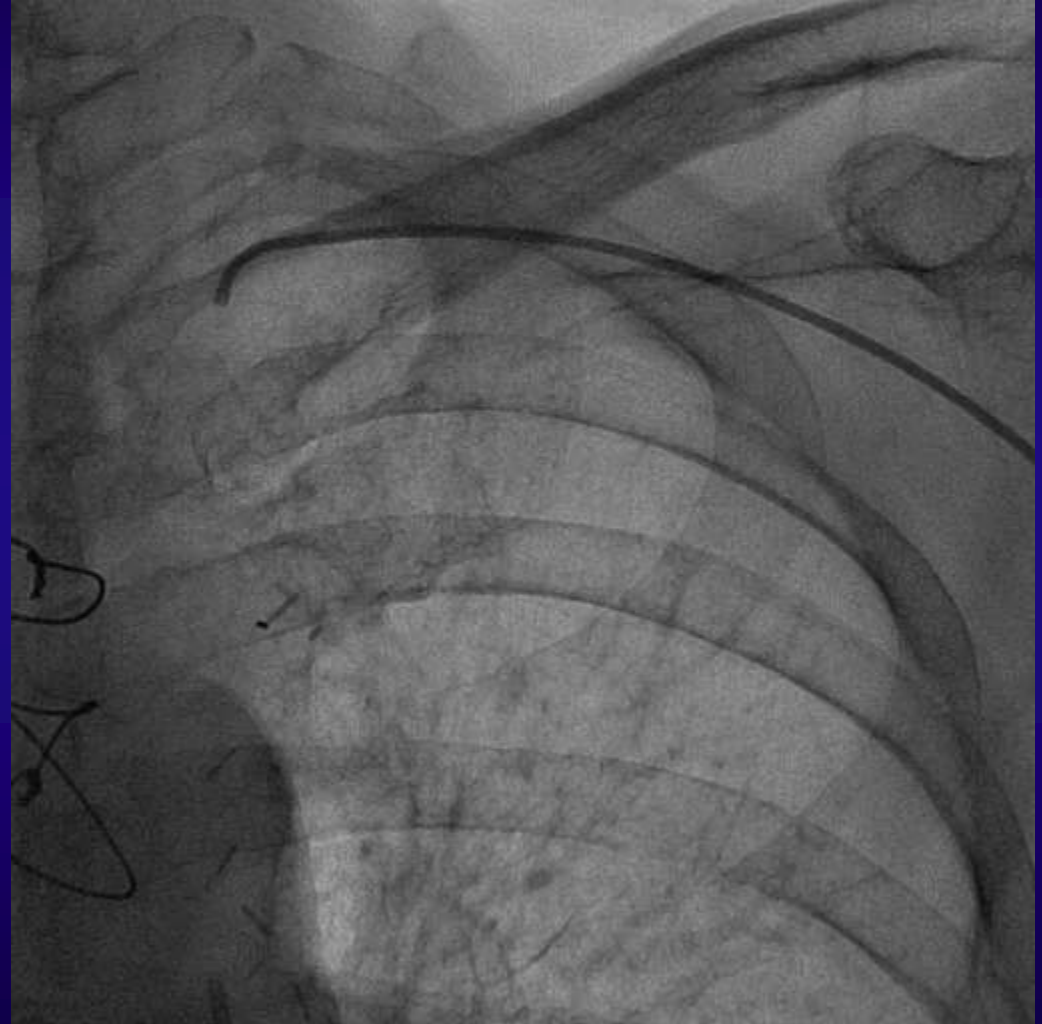
**UAP complicated by
cardiogenic shock,
71 y.o. Male**

Post CABG

LITA-LAD: closed

SVG-IM: closed

SYNTAX Score 34



Case: Trifurcation LM lesion

Case

**UAP complicated by
cardiogenic shock,**

71 y.o. Male

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

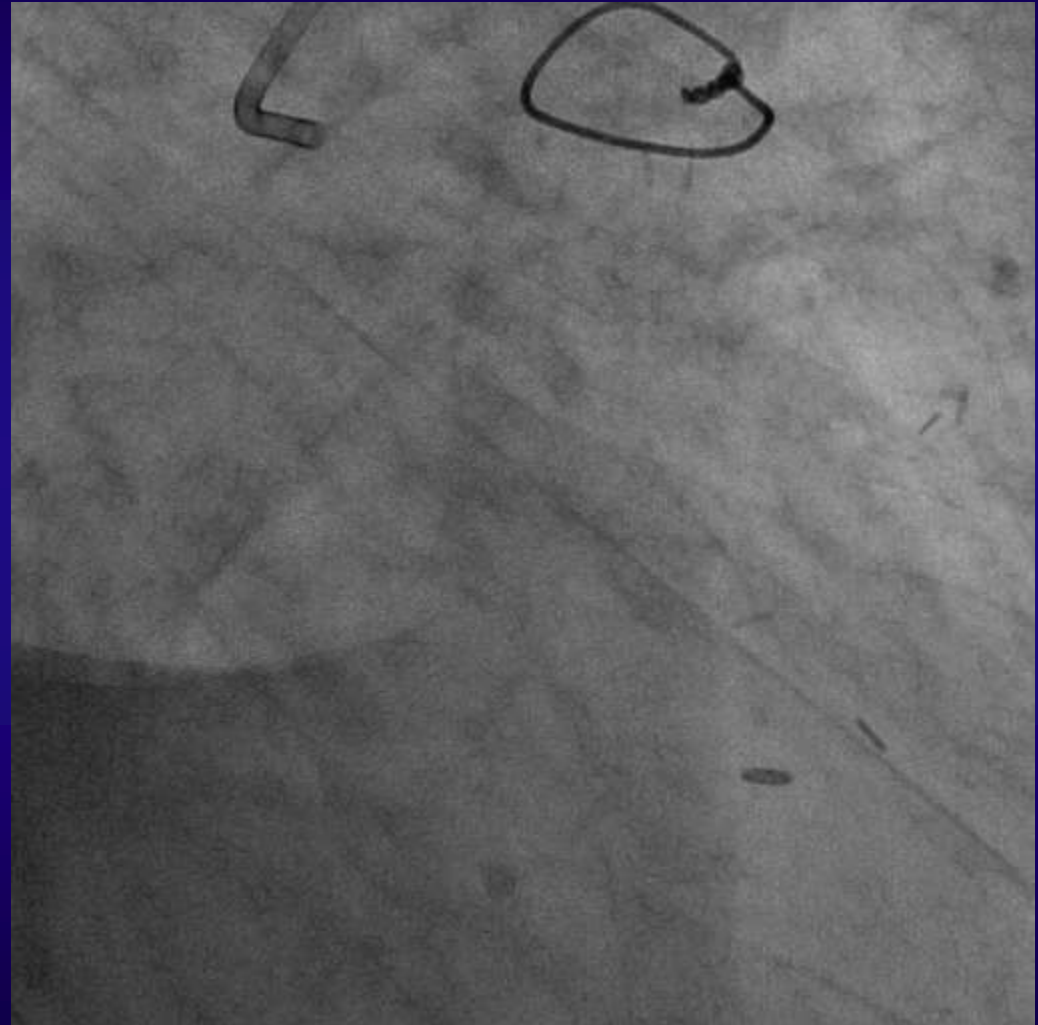
IABP assisted

Post CABG

LITA-LAD: closed

SVG-IM: closed

SYNTAX Score 34



Case: Trifurcation LM lesion

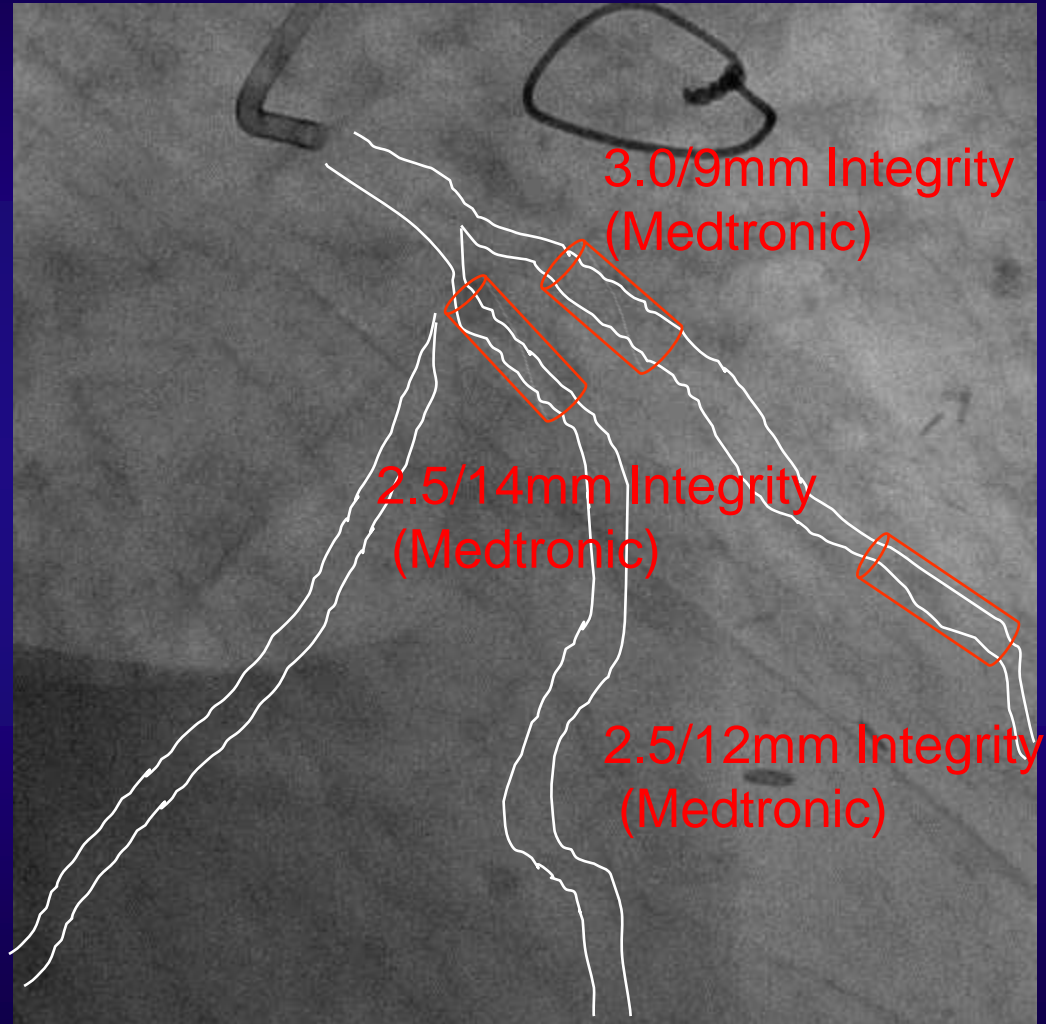
Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

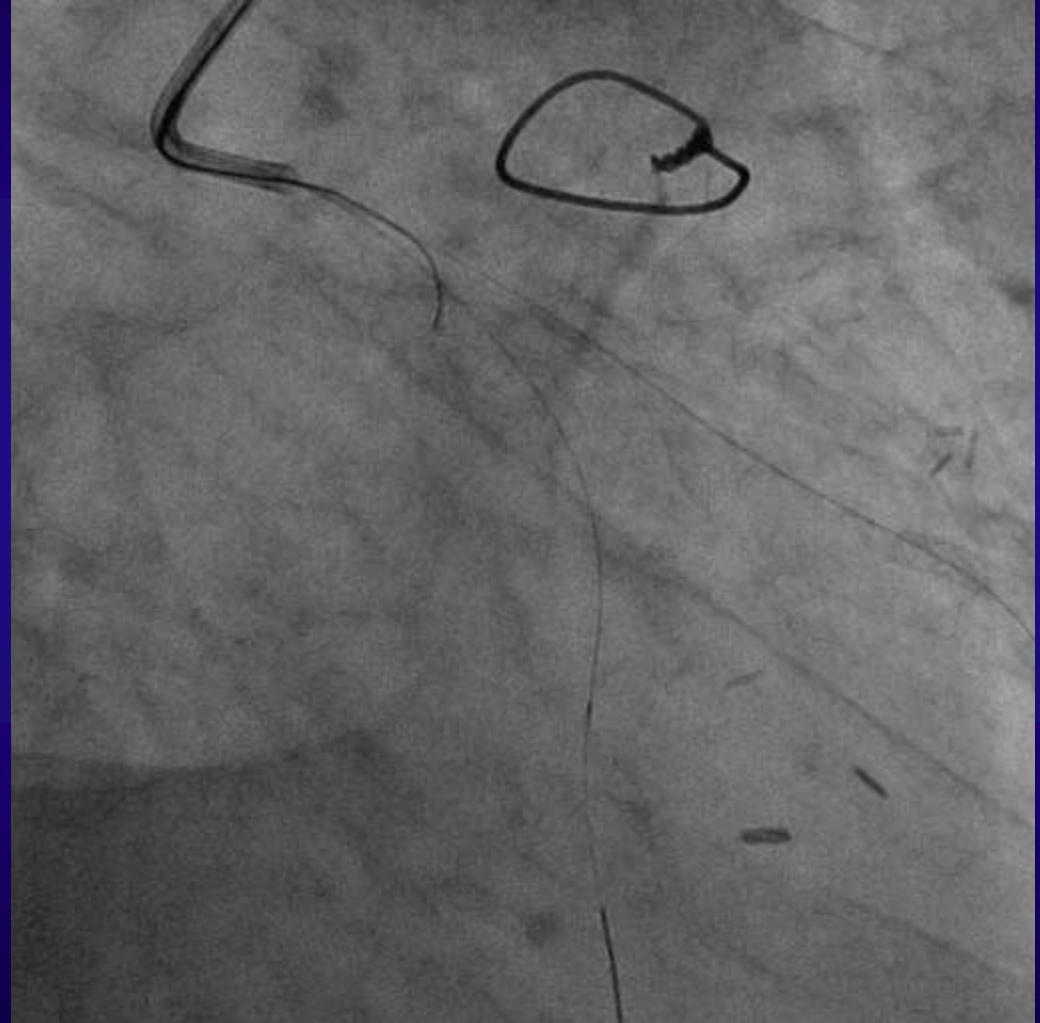
GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:

***LAD, IM: BMW universal
II (Abbott Vascular)***

***LCx: XT-R (ASAHI
INTECC)***



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

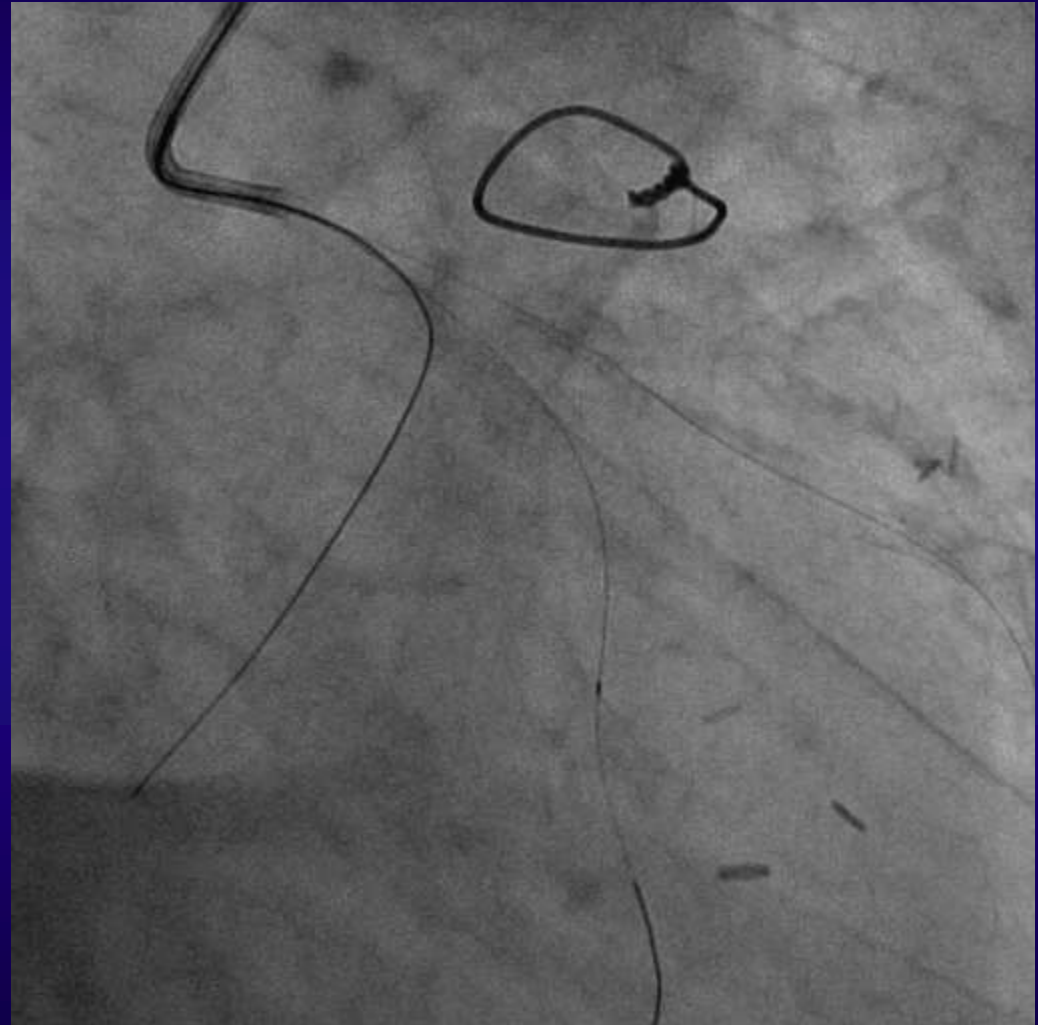
GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:

***LAD, IM: BMW universal
II (Abbott Vascular)***

***LCx: XT-R (ASAHI
INTECC)***



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x3

(Abbott Vascular)

Balloon:

***2.0/15mm TREK (Abbott
Vascular)***



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x3

(Abbott Vascular)

Stent: 2.25/12 mm

Promus Element

(BSC)

Balloon:

2.5/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x3

(Abbott Vascular)

Stent: 2.25/12 mm

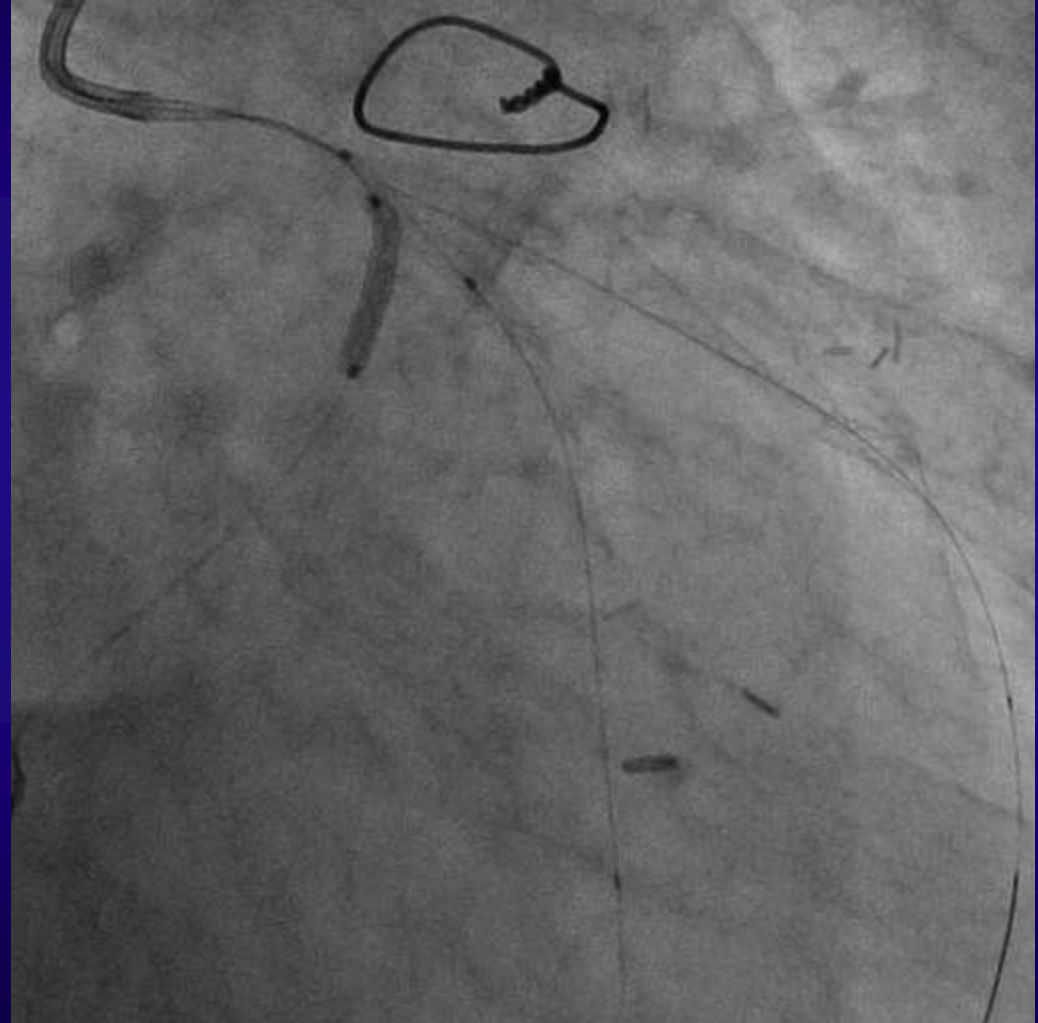
Promus Element

(BSC)

Balloon:

2.5/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x2

(Abbott Vascular)

Stent: 2.25/12 mm

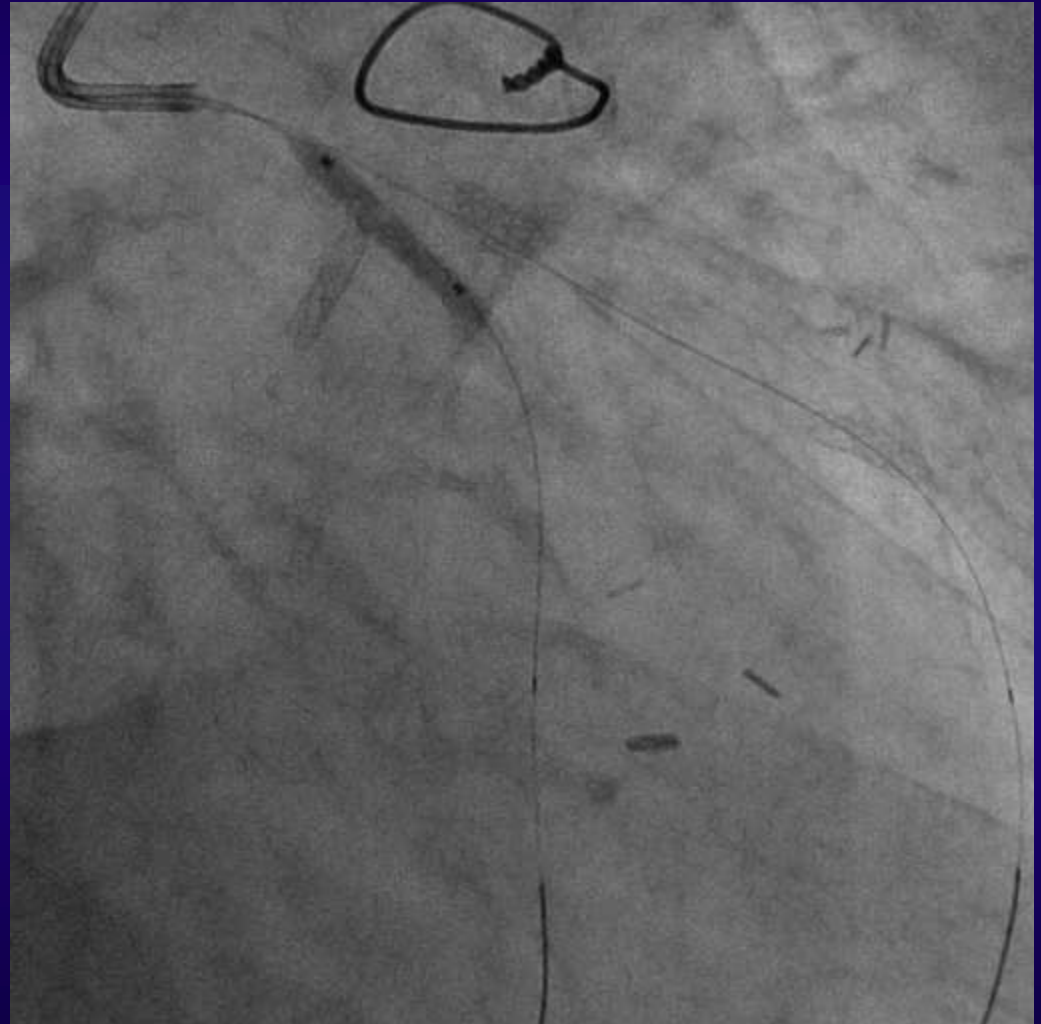
Promus Element

(BSC)

Balloon:

2.5/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x2

(Abbott Vascular)

Stent: 2.5/28 mm

Promus Element

(BSC)

Balloon:

3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x2

(Abbott Vascular)

Stent: 2.5/28 mm

Promus Element

(BSC)

Balloon:

3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II

(Abbott Vascular)

Stent: 2.5/28 mm

Promus Element

(BSC)

Balloon:

3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

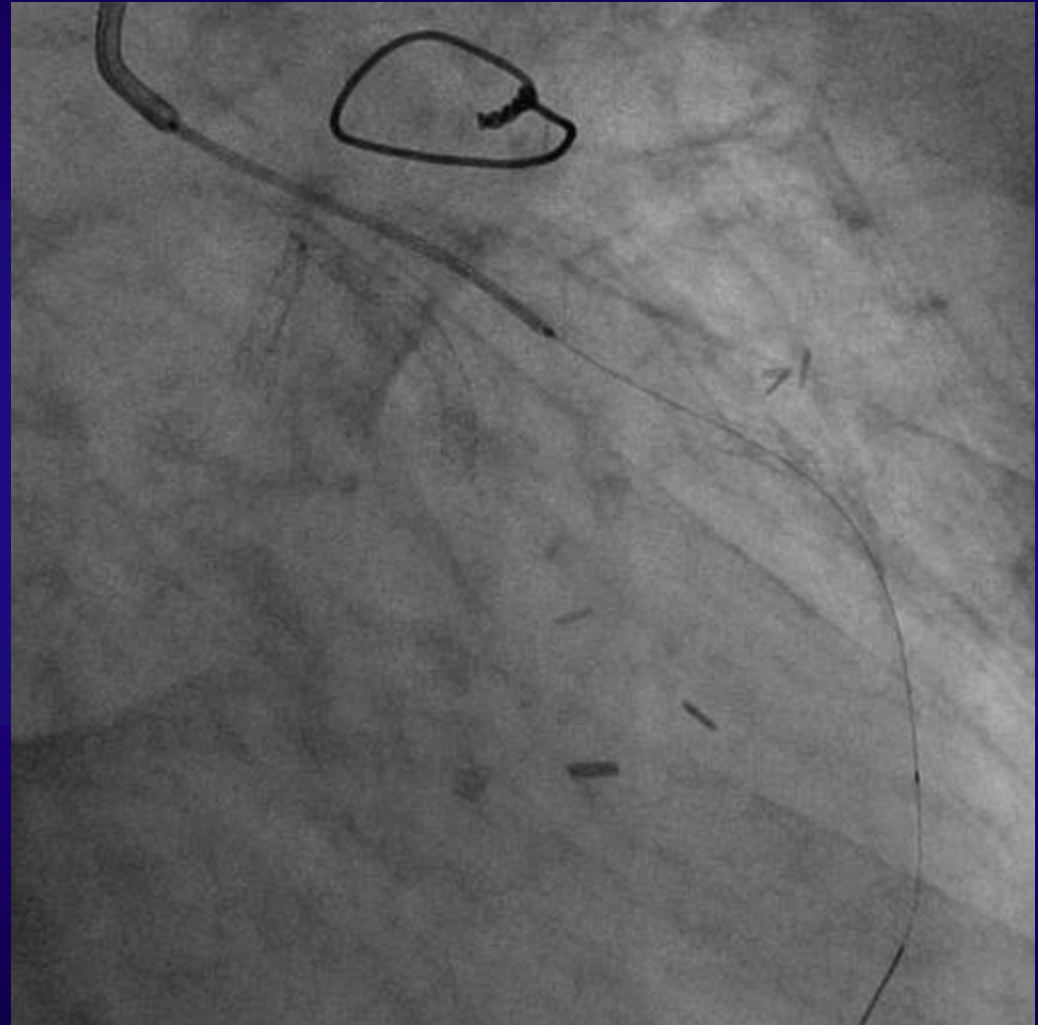
GW:BMW universal II

(Abbott Vascular)

Stent: 3.0/38 mm

Promus Element

(BSC)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

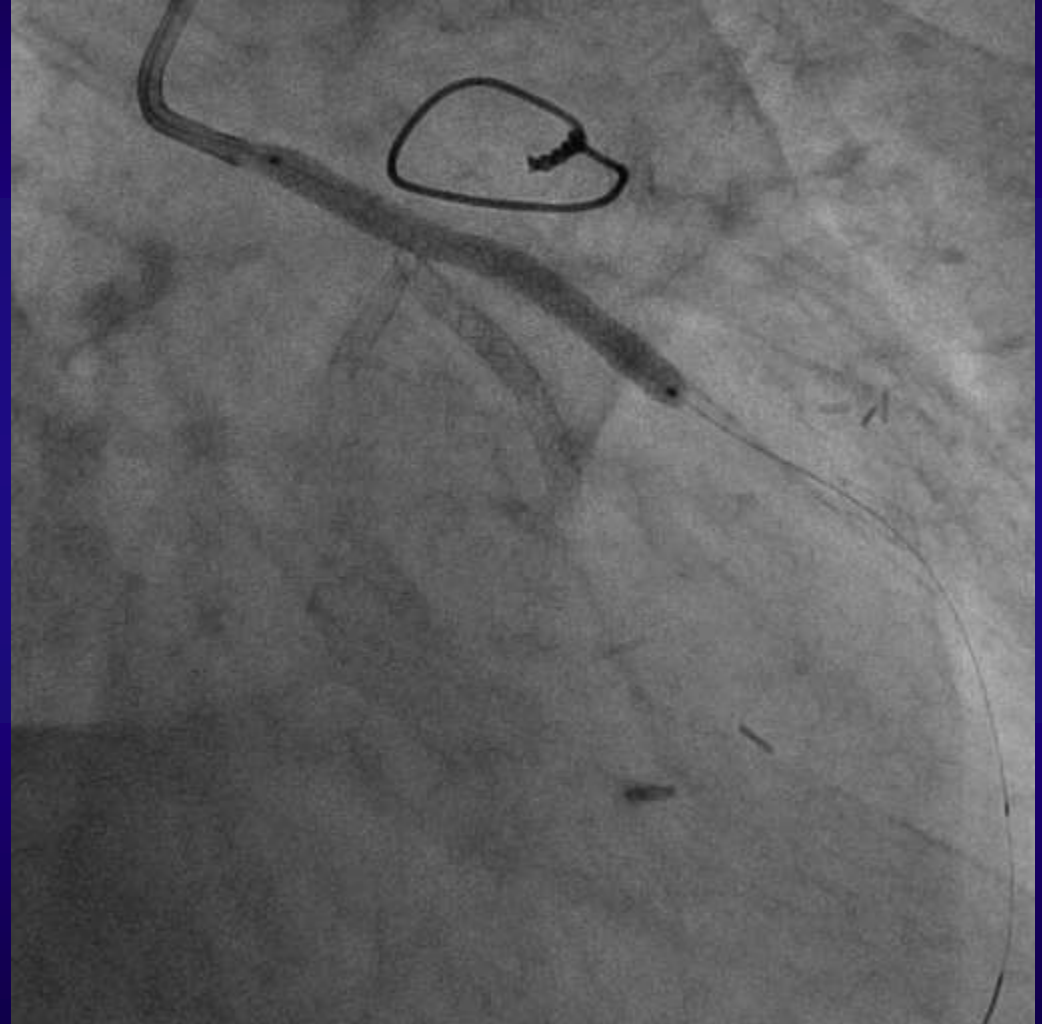
GW:BMW universal II

(Abbott Vascular)

Stent: 3.0/38 mm

Promus Element

(BSC)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

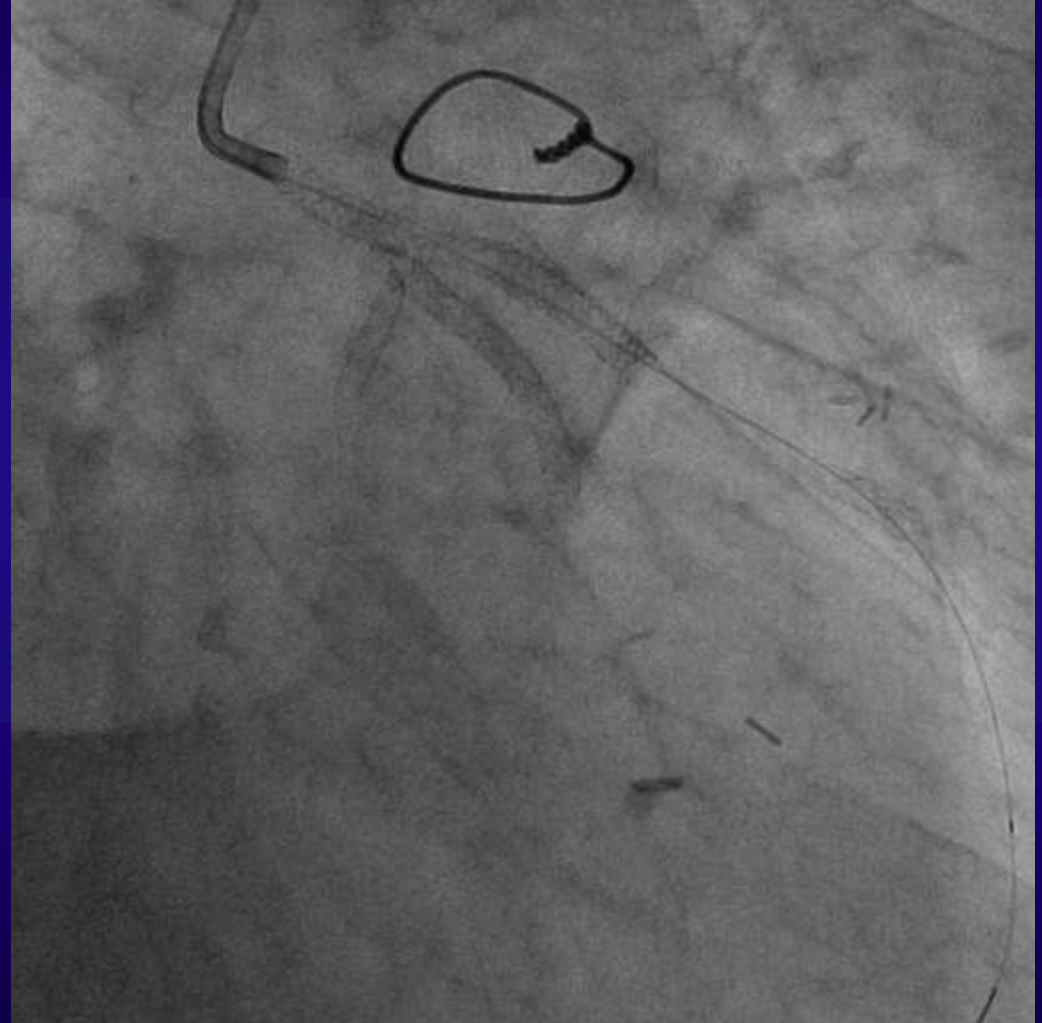
GW:BMW universal II

(Abbott Vascular)

Stent: 3.0/38 mm

Promus Element

(BSC)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x2

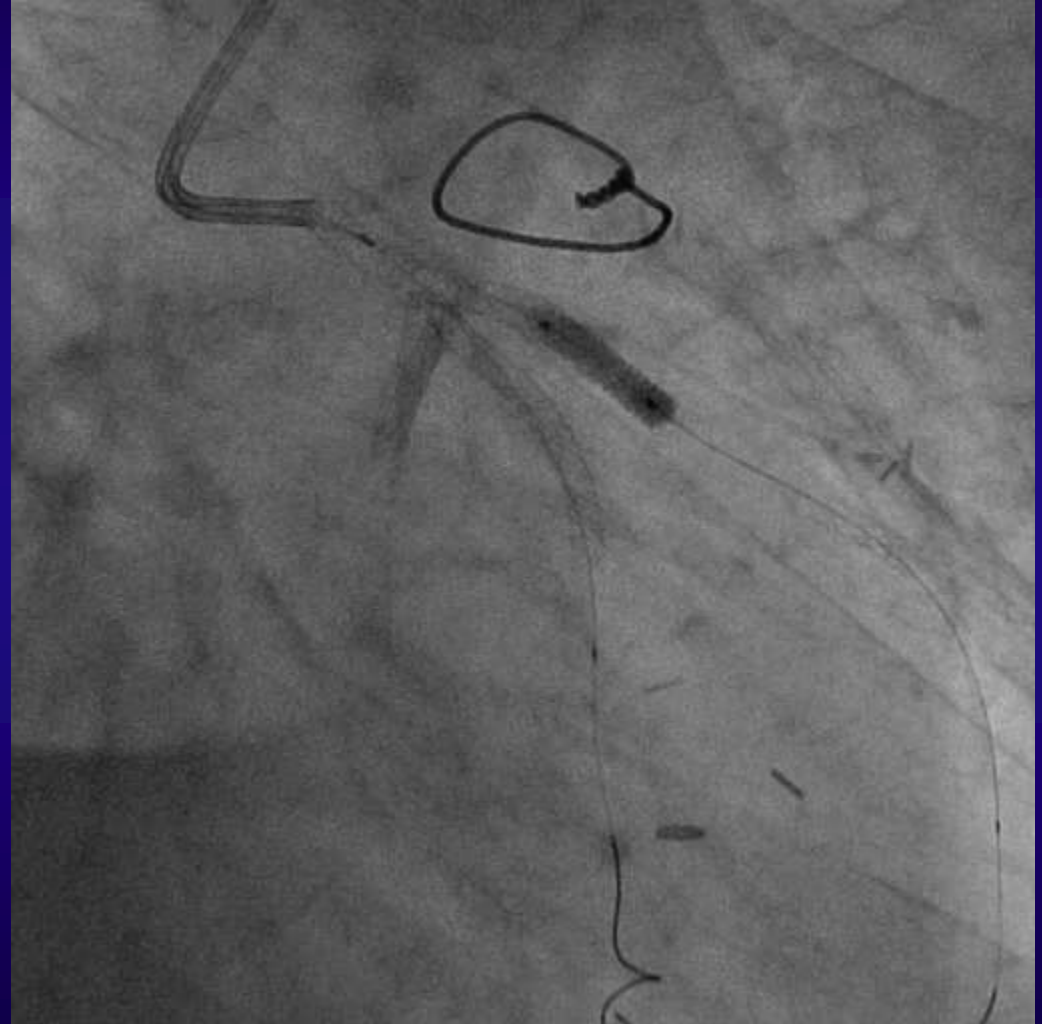
(Abbott Vascular)

Balloon: IM:1.25/10 mm

Sapphire (OrbusNeich)

LAD:3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

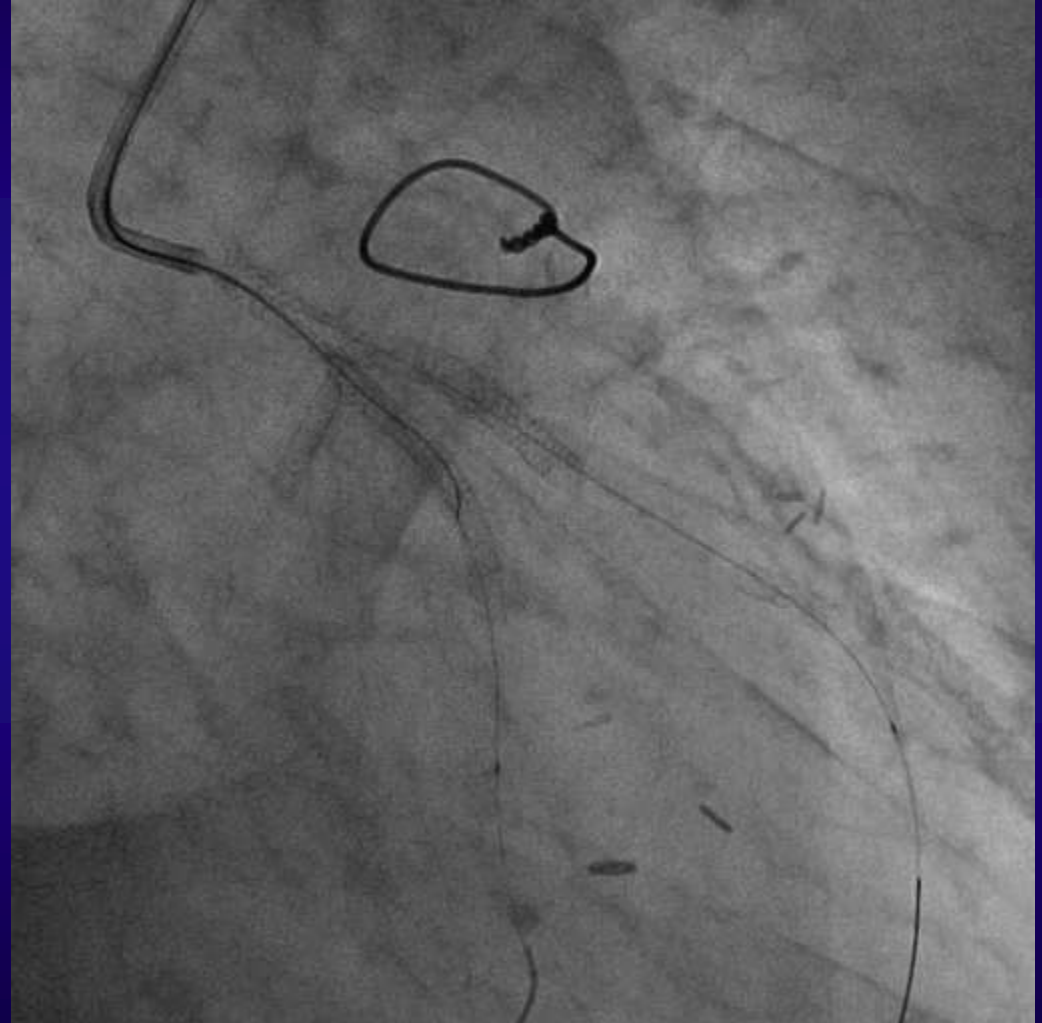
(Mach 1, BSC)

GW:BMW universal II x2

(Abbott Vascular)

Runthrough HC

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II

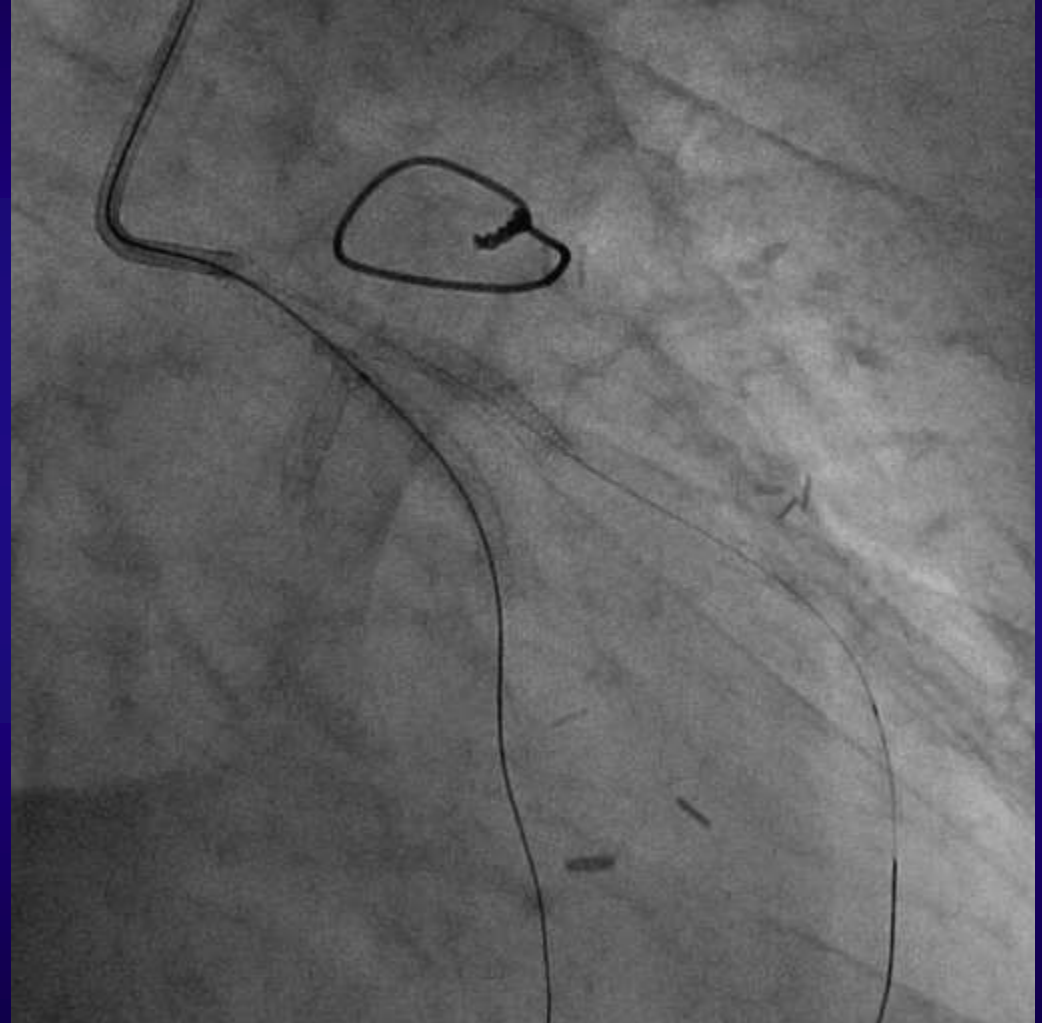
(Abbott Vascular)

Runthrough HC

(Terumo)

Balloon: 1.25/10 mm

Sapphire (OrbusNeich)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II

(Abbott Vascular)

Runthrough HC

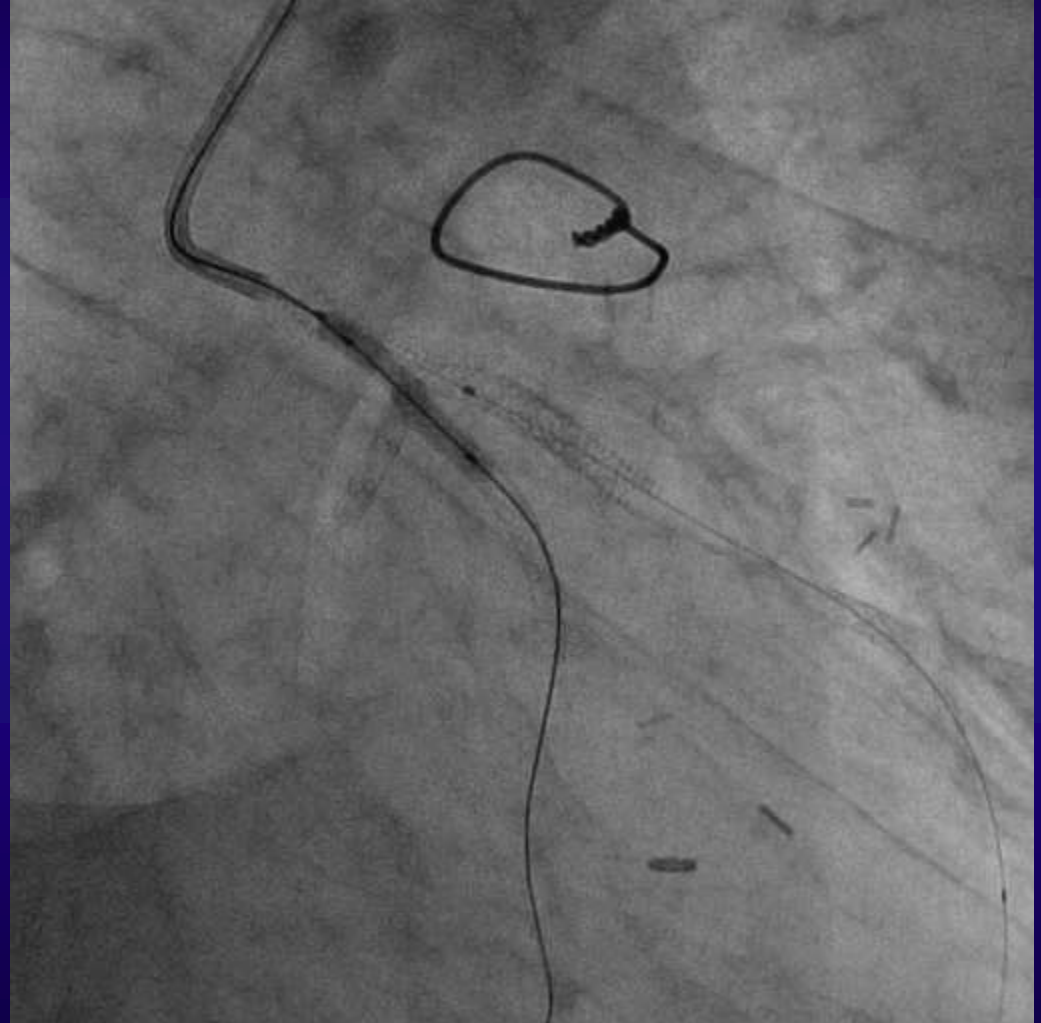
(Terumo)

Balloon: IM:2.5/15 mm

Emerge (BSC)

LAD:3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II

(Abbott Vascular)

Runthrough HC

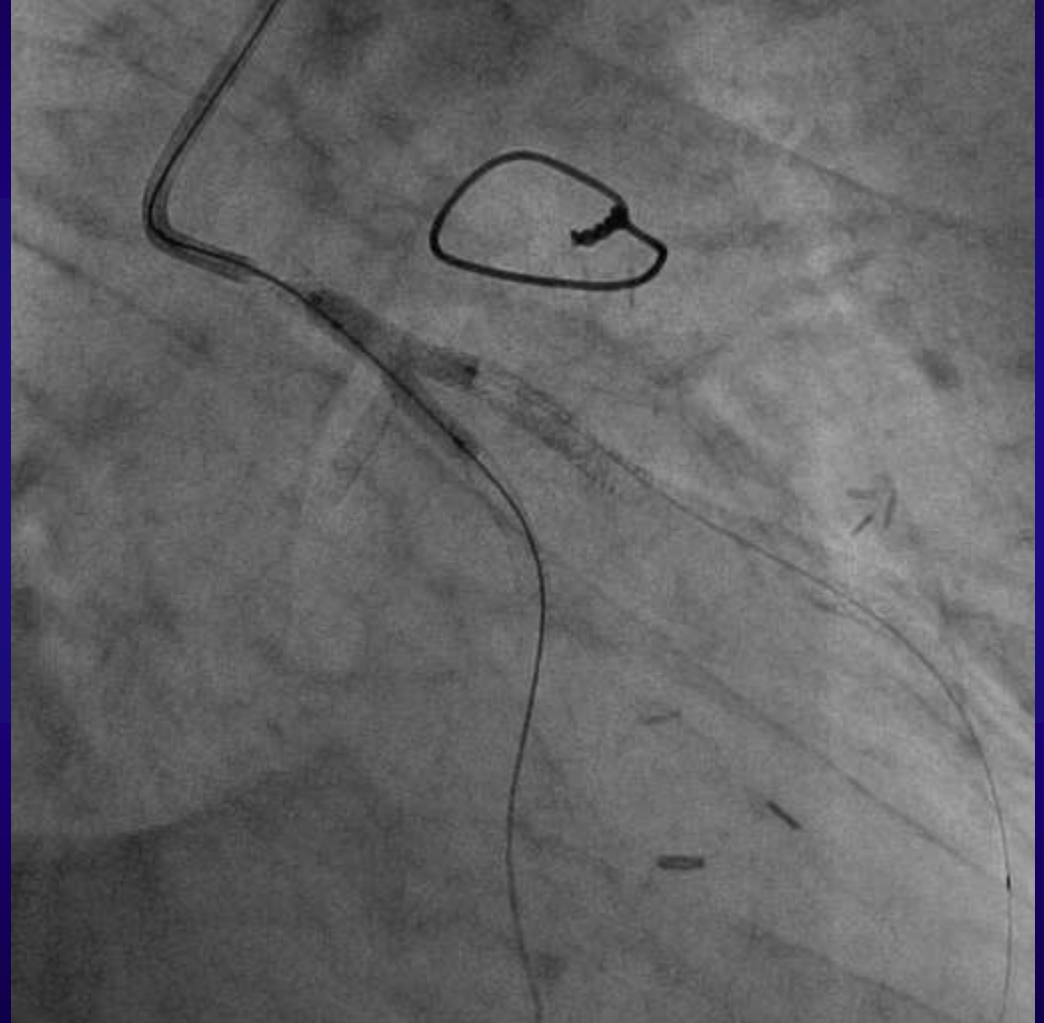
(Terumo)

Balloon: IM:2.5/15 mm

Emerge (BSC)

LAD:3.0/15 mm Hiryu

(Terumo)



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

GW:BMW universal II x2

(Abbott Vascular)

Runthrough HC

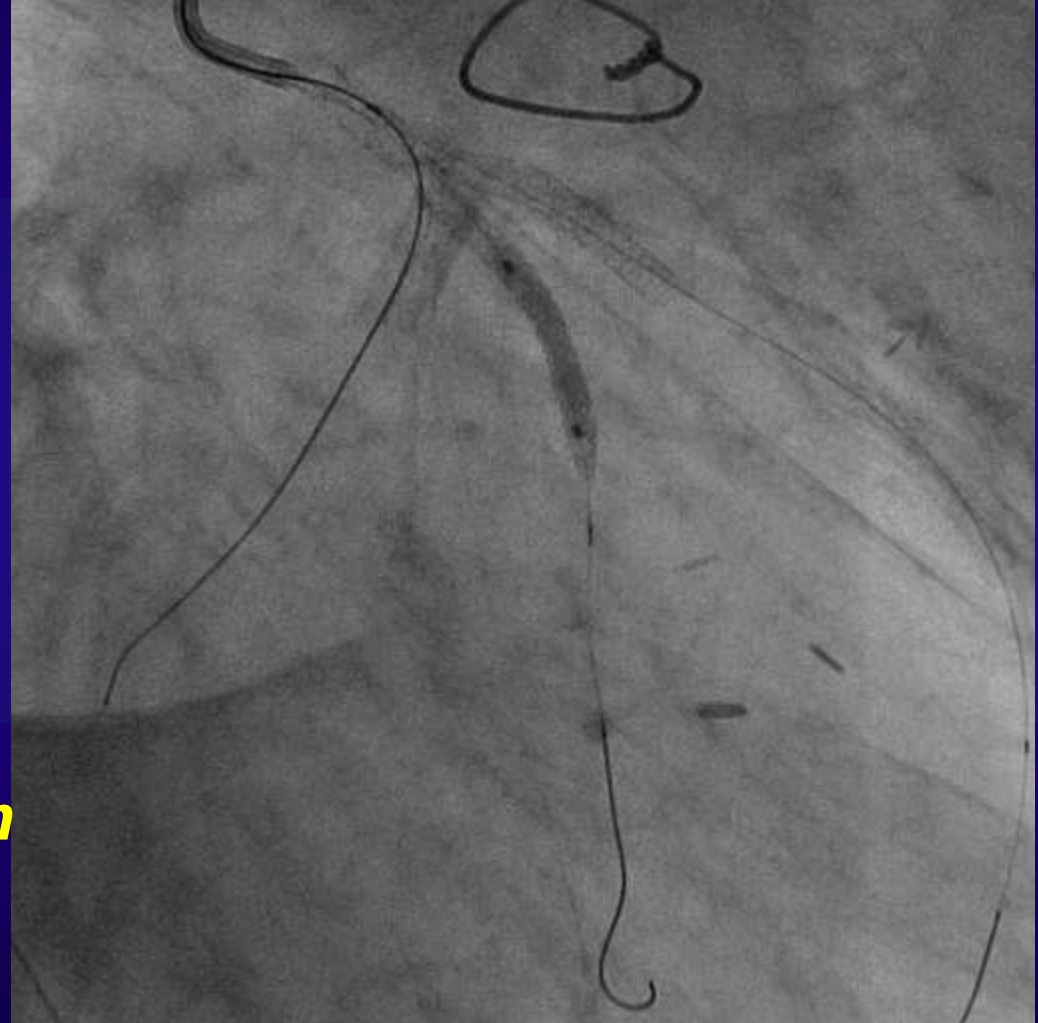
(Terumo)

Balloon: LCx:1.25/10 mm

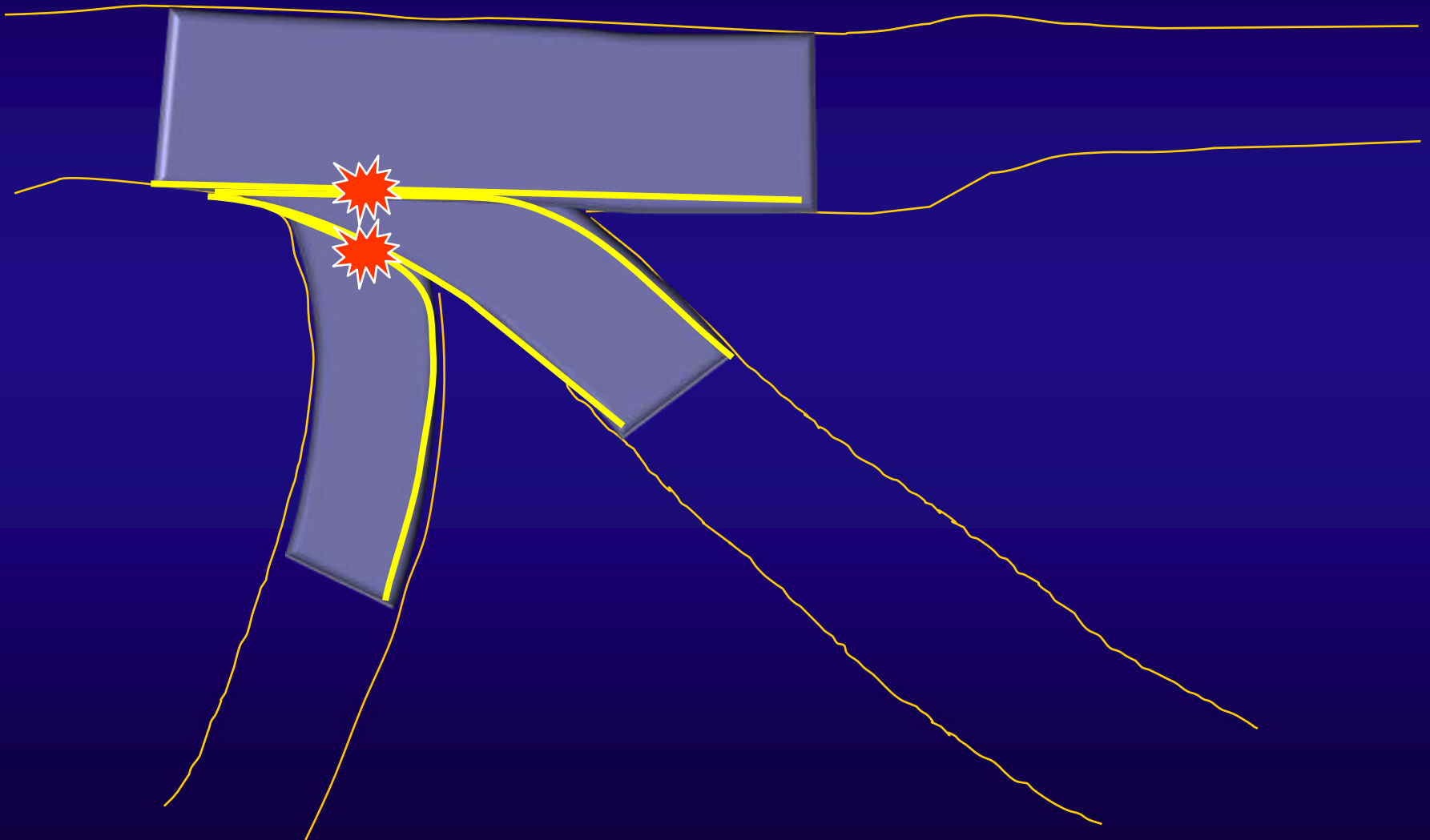
Sapphire (OrbusNeich)

IM:3.0/15 mm Hiryu

(Terumo)



Double Mini-Crush Technique for Trifurcation Lesions by 6Fr TRI



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
71 y.o. Male***

Rt. radial approach

GC: 6Fr. VL3.0

(Mach 1, BSC)

Final result



Case: Trifurcation LM lesion

Case

***UAP complicated by
cardiogenic shock,
72 y.o. Male***

F-up CAG

12 month after PCI



Case 2

【Case】 75-year-old male

【Case history】 He presented to our hospital for chest pain on October 10, 2015. The CAG revealed severe stenosis of LMT distal and also LAD ostium, LCx ostium and Intermediate branch ostium.

Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

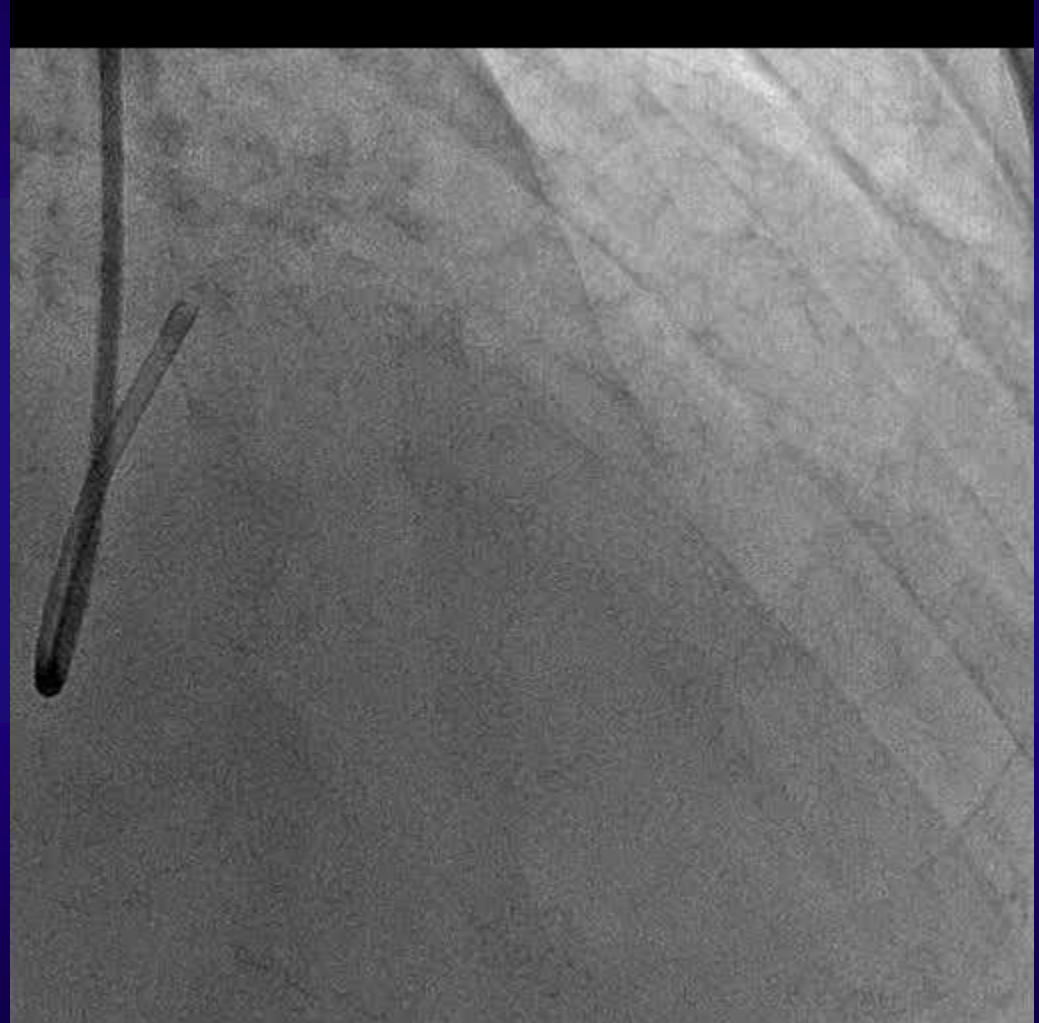
Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

SYNTAX Score 36

**(including RCA prox.
and distal lesions)**



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

SYNTAX Score 36

**(including RCA prox.
and distal lesions)**



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

SYNTAX Score 36

**(including RCA prox.
and distal lesions)**



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Balloon:

2.25/15mm Sapphire II

(OrbusNeich)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

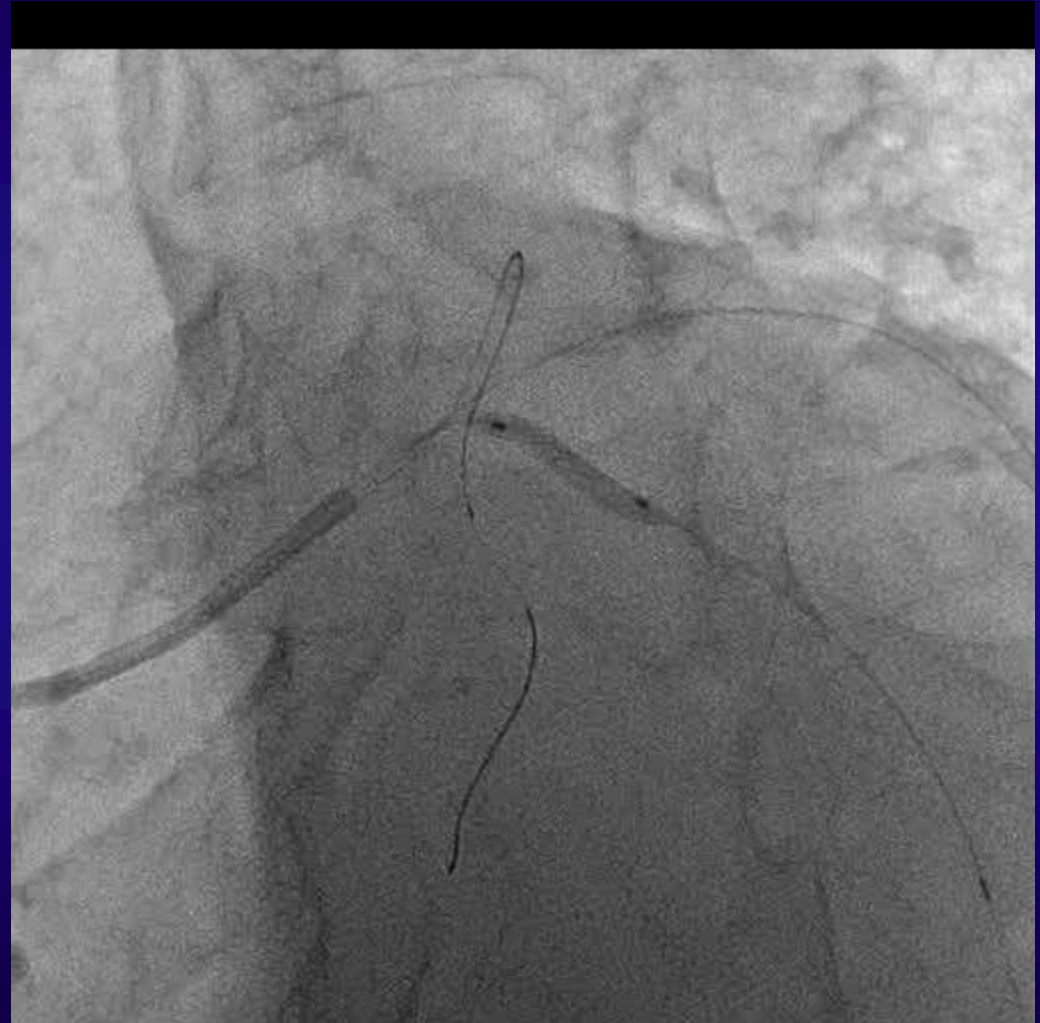
universal II (Abbott

Vascular)

Balloon:

2.25/15mm Sapphire II

(OrbusNeich)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

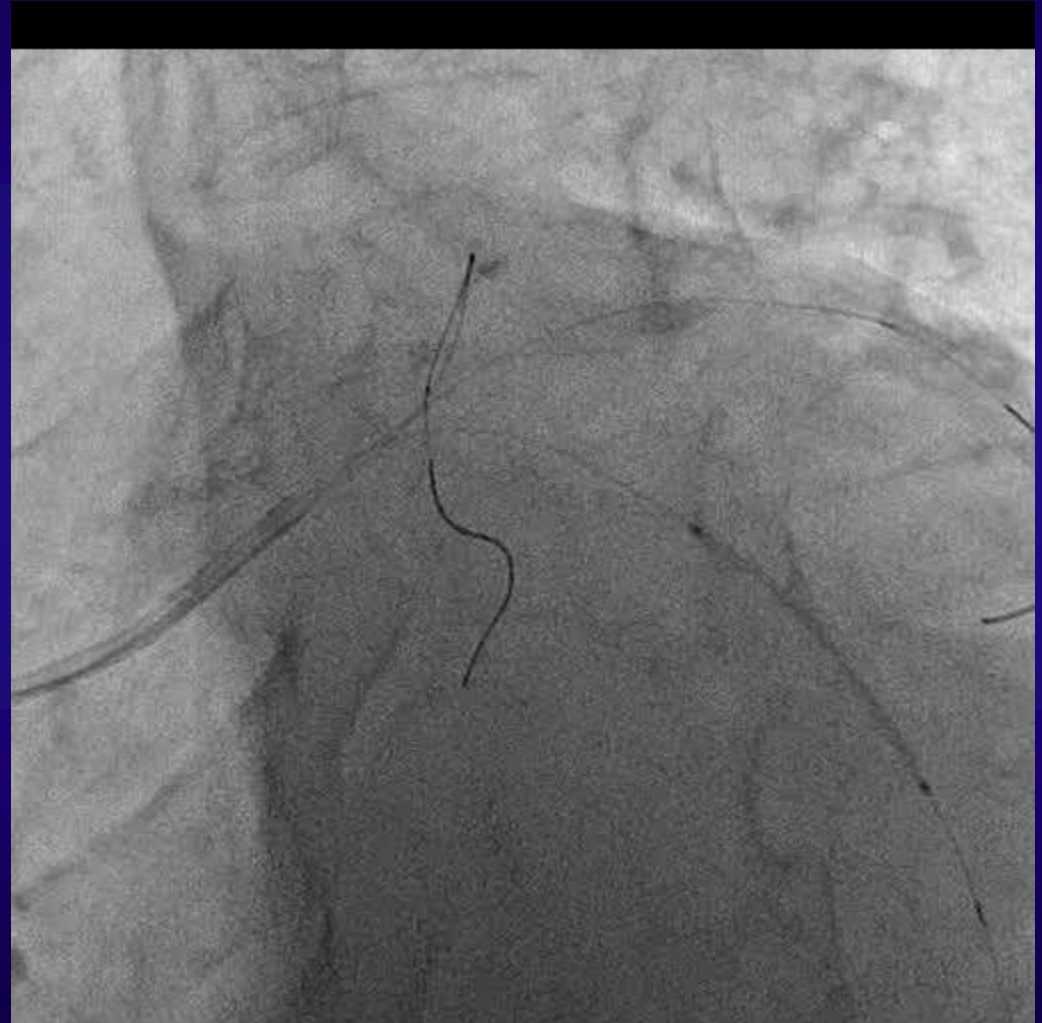
universal II (Abbott

Vascular)

Stent: 2.5/26 mm

Resolute Integrity

(Medtronic)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

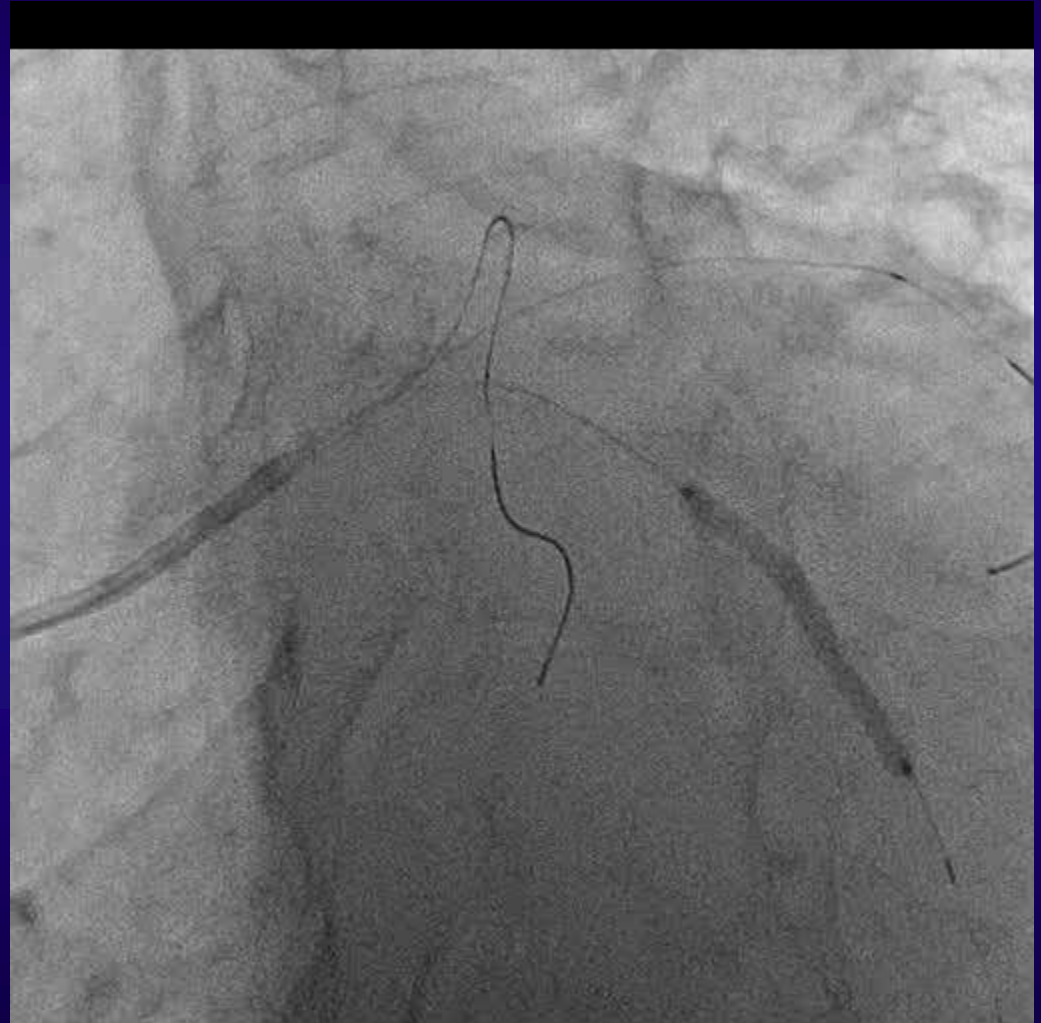
universal II (Abbott

Vascular)

Stent: 2.5/26 mm

Resolute Integrity

(Medtronic)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.5/30 mm

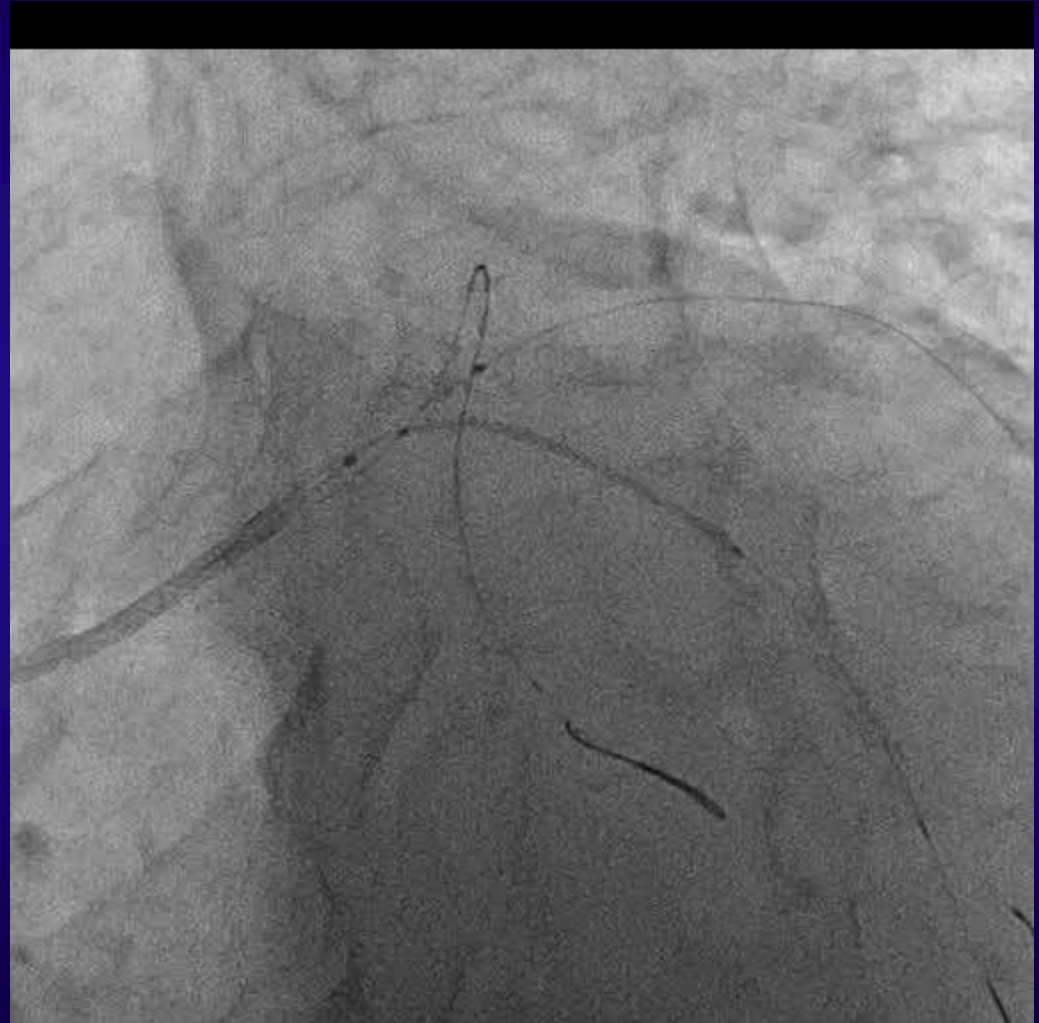
Resolute Integrity

(Medtronic)

Balloon:

2.5/15 mm NC Euphora

(Medtronic)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.5/30 mm

Resolute Integrity

(Medtronic)

Balloon:

2.5/15 mm NC Euphora

(Medtronic)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.5/30 mm

Resolute Integrity

(Medtronic)

Balloon:

2.5/15 mm NC Euphora

(Medtronic)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.75/38 mm

Ultimaster

(Terumo)

Balloon:

3.0/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.75/38 mm

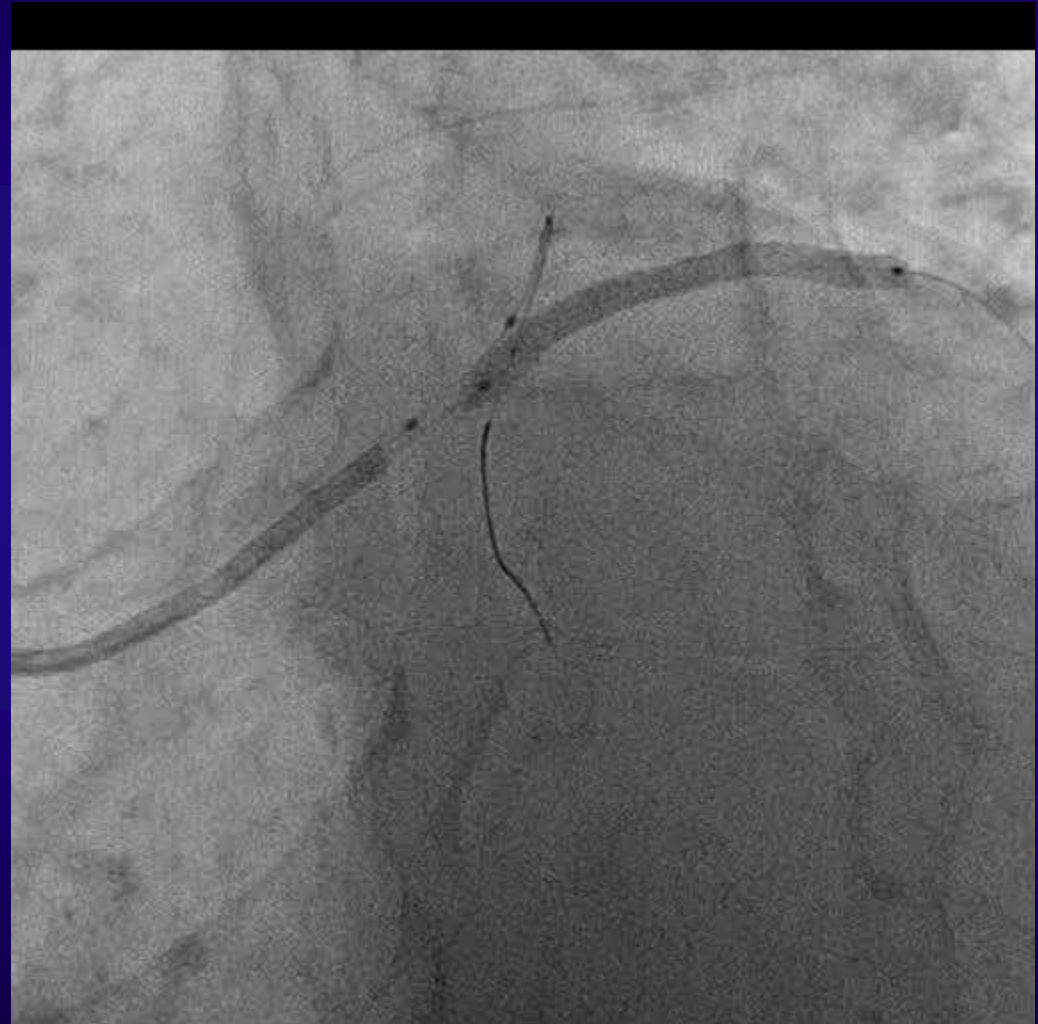
Ultimaster

(Terumo)

Balloon:

3.0/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 2.75/38 mm

Ultimaster

(Terumo)

Balloon:

3.0/15 mm Tazuna

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 3.5/18 mm Nobori

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

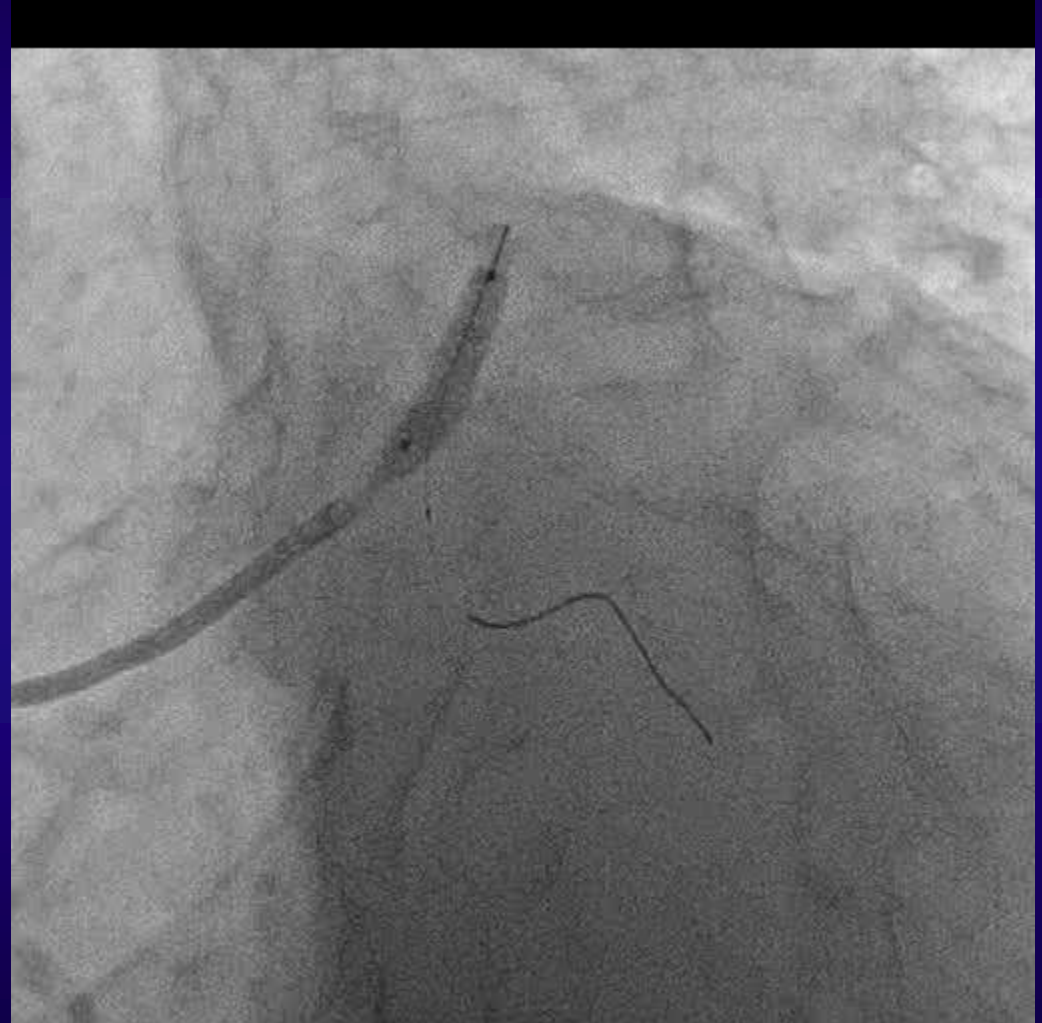
LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Stent: 3.5/18 mm Nobori

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Balloon:

4.0/10 mm Hiryu Plus

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Balloon:

2.5/15 mm Euphora

(Medtronic)

3.5/15 mm Hiryu Plus

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

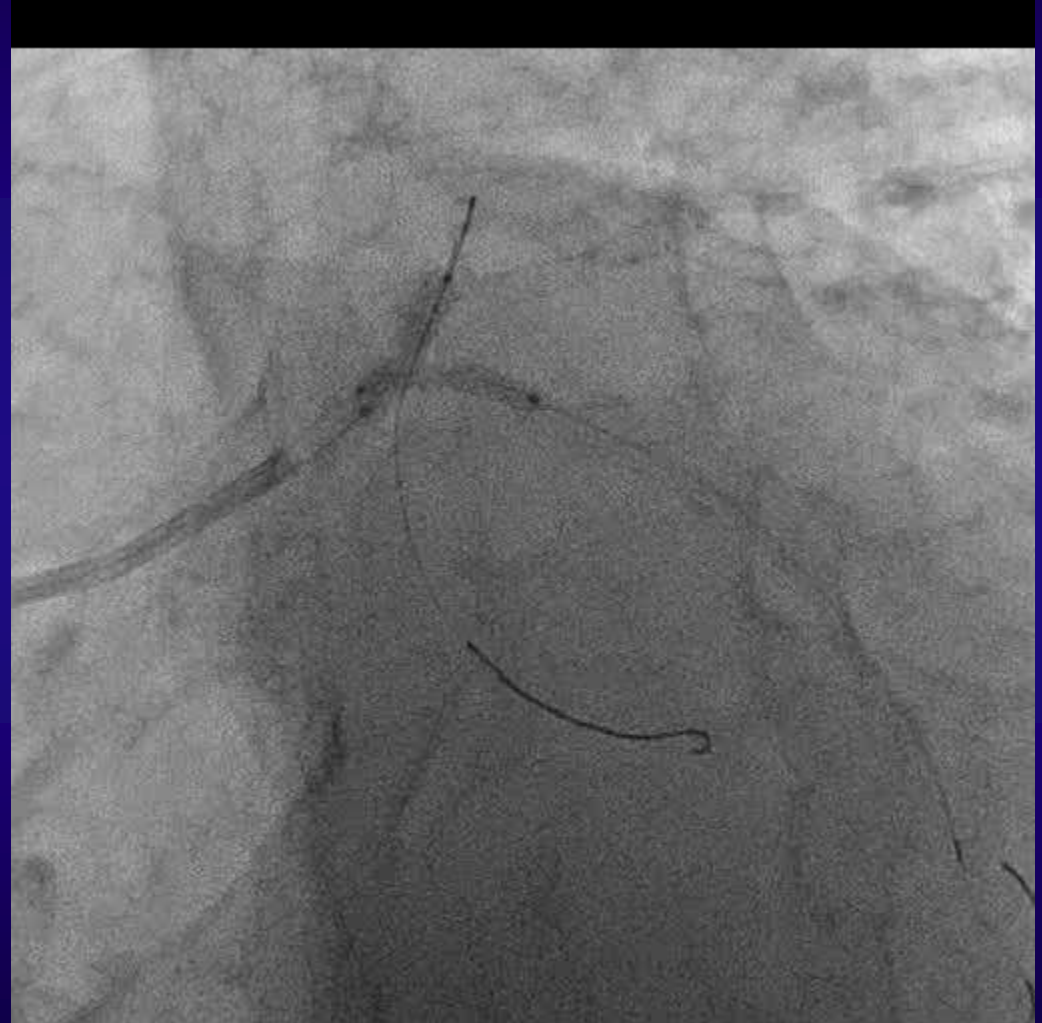
Balloon:

2.5/15 mm Euphora

(Medtronic)

3.5/15 mm Hiryu Plus

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

Balloon:

2.5/15 mm Euphora

(Medtronic)

3.5/15 mm Hiryu Plus

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC) GW:

LAD, IM, LCx: BMW

universal II (Abbott

Vascular)

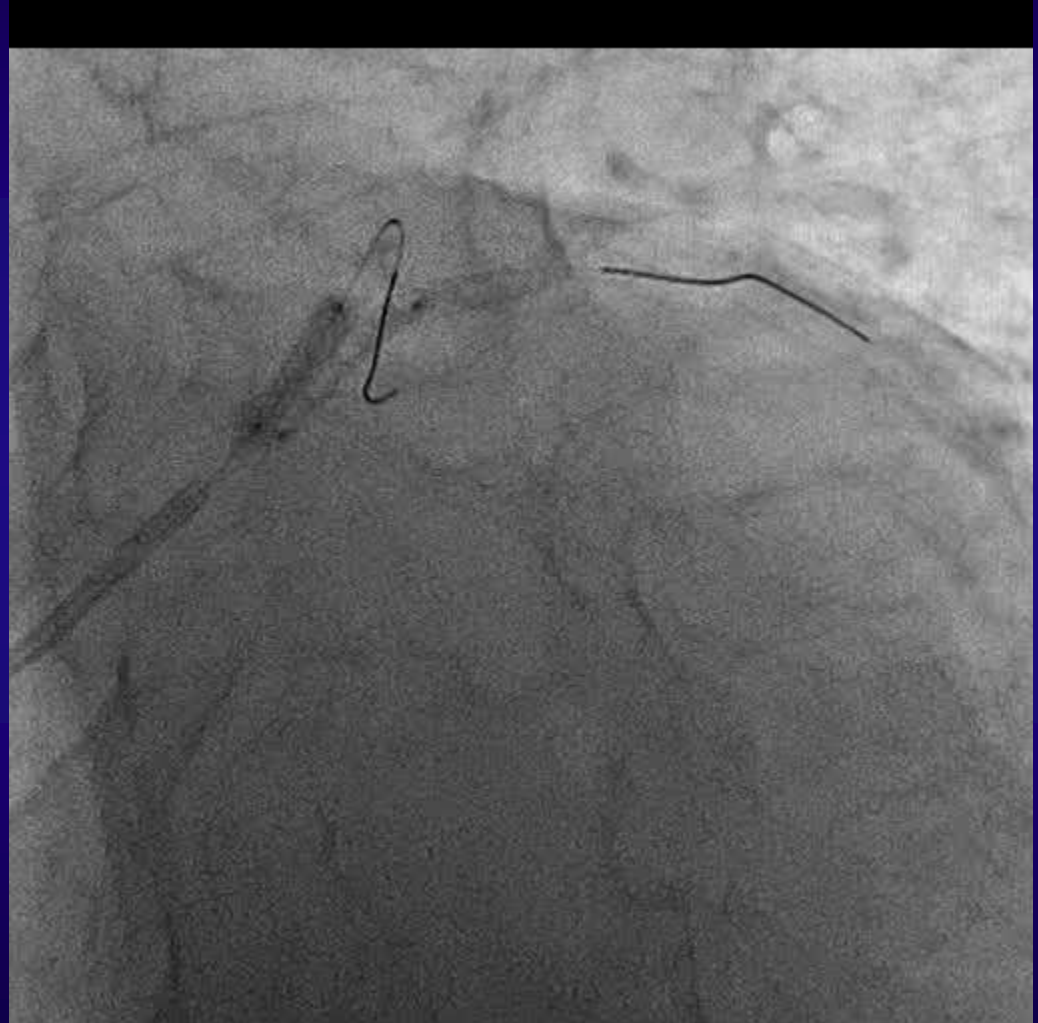
Balloon:

2.5/15 mm Euphora

(Medtronic)

3.5/15 mm Hiryu Plus

(Terumo)



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

Final result



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

Final result



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

Lt. radial approach

GC: 6Fr. VL3.5

(Mach 1, BSC)

Final result



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

F-up CAG

12 month after PCI



Case: Trifurcation LM lesion

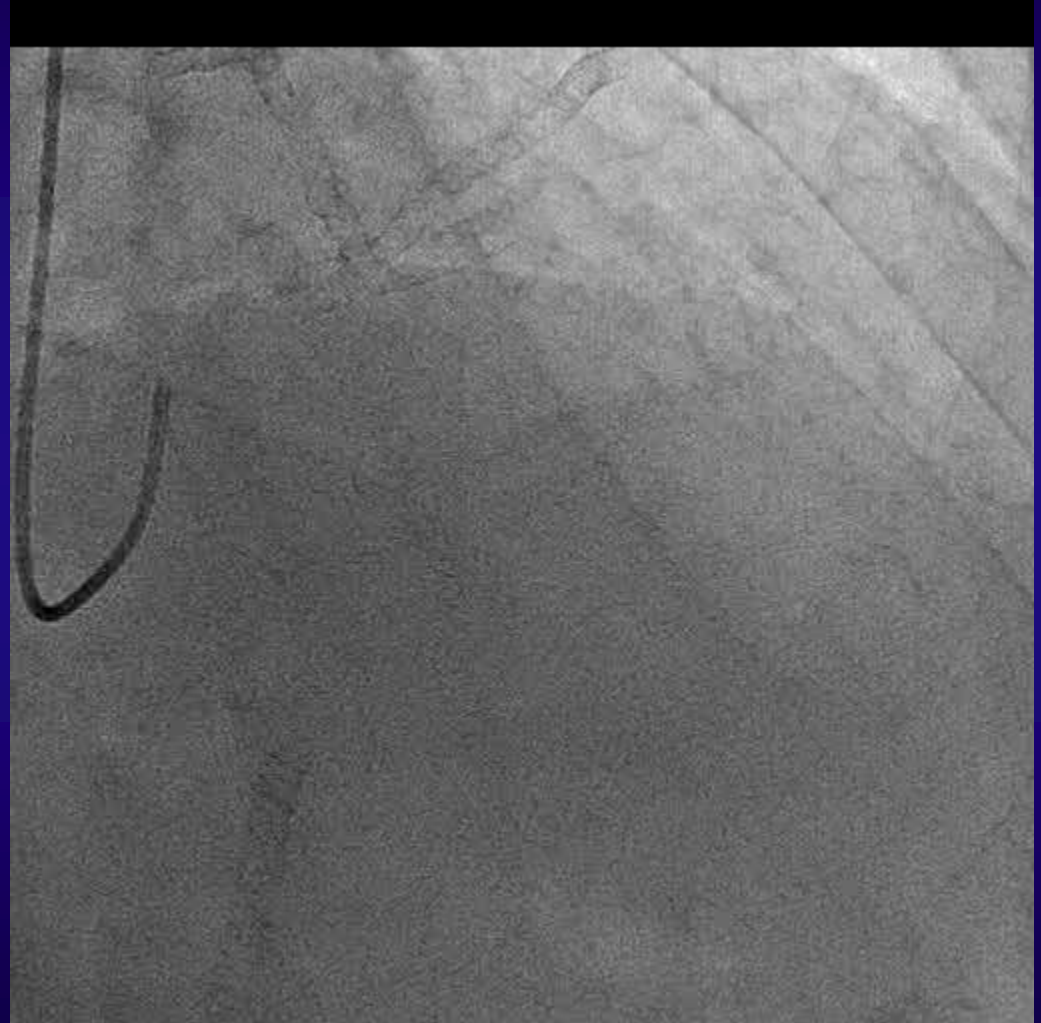
Case

UAP

75 y.o. Male

F-up CAG

12 month after PCI



Case: Trifurcation LM lesion

Case

UAP

75 y.o. Male

F-up CAG

12 month after PCI



Two stent strategy for LM bifurcation

Bifurcation angle

Close to 90°

T or TAP

Crush

Shallow angle

Culotte or Crush

MV/SB diam.

Discrepancy (+)

Crush

MV/SB diam.

Discrepancy (-)

Culotte

Crush

Bifurcation stenting: Advantage and Disadvantage

	Crush	Culottes	TAP	SKS	T
Complete coverage of SB ostium	○	○	○	○	Depends on SB angulation
Assure SB patency during procedure	○			○	○ (Classic T)
Long term problems	SB restenosis			Neo carina by struts	(SB restenosis by gap)
KBT complexity	troublesome				
6Fr.compatibility	○ (Modified crush)	○	○		○
Other technical problems		(MV/SB diam. Discrepancy)			

Conclusions

- We experienced complex trifurcated LM lesions successfully treated using double mini-crush technique by 6Fr.TRI
- Mini crush technique has an advantage which can prevent side branch occlusion during the procedure
- Mini crush technique is the only option for treatment of trifurcated lesions by three stenting technically

Thank You