

Case Presentation & Focus Review:

CTO INTERVENTIONS

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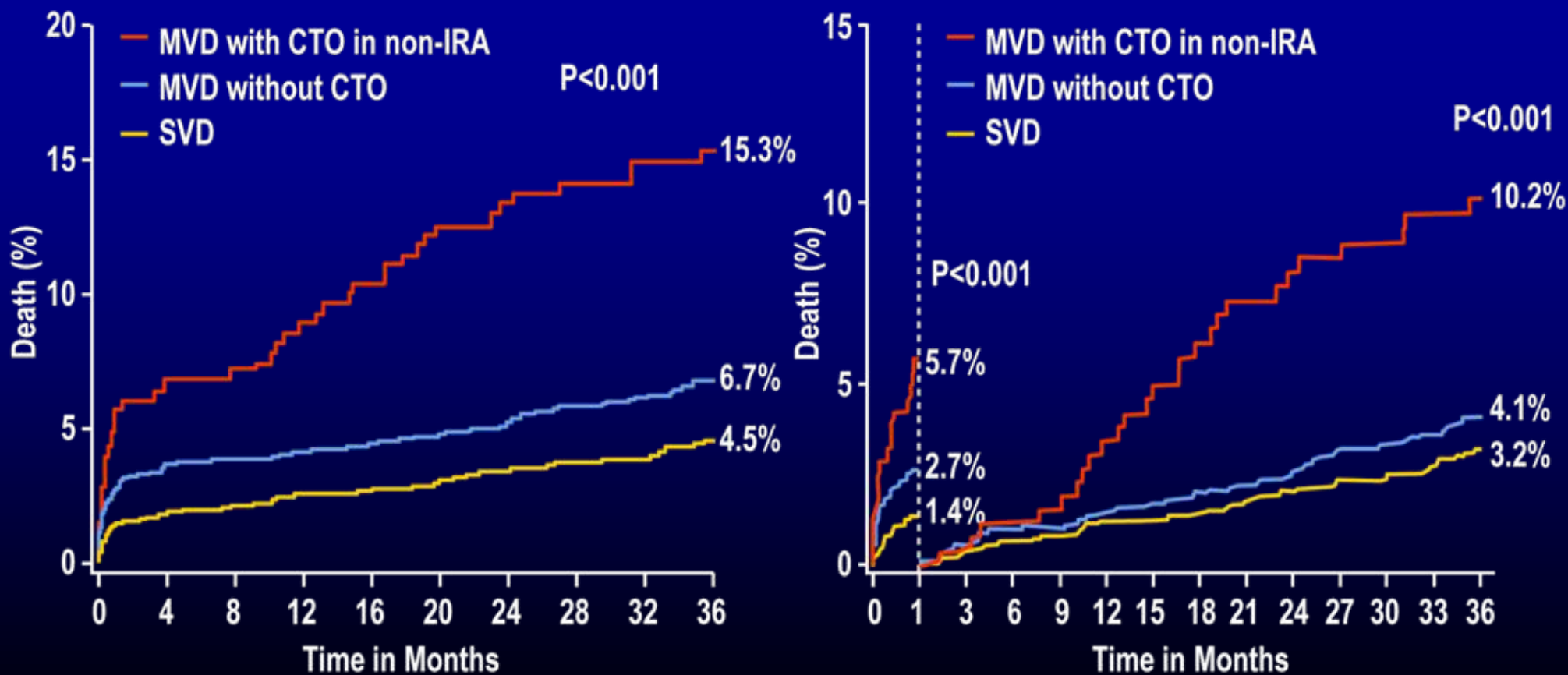
Indications for CTO Recanalization

***Evaluation of a CTO in a non IRA
in the post STEMI patient***

Prognostic Impact of a CTO in a Non-IRA in Pts with STEMI: HORIZONS-AMI trial (N=3823)

1524 (46.4%) SVD; 1477 (45%) MVD w/o CTO; 283 (8.6%) MVD w/ CTO

Time to Event Curves for Overall 3-Year Mortality



47 Year Old Male Presenting with Anterior STEMI

History:

Sept 2012: Acute anterior STEMI. Stenting of distal LAD.
Noted to have CTO of RCA and LCX-OM

12/10/12: Unsuccessful attempt to open LCX-OM (outside hospital).
Continuing chest pain, dyspnea

Past History & Risk Factors: Diabetes, Dyslipidemia, HDL 23,
Hypertension, Tobacco abuse

Medications: Lisinopril 10mg qd; Chantix; NTG prn; Carvedilol 25mg qd;
Glipizide 10mg bid; Humalog daily; Crestor 20mg qd;
Tramadol HCl 50mg prn; Brilinta 90mg bid; ASA 325mg qd

Exam: 6'0", 280 lbs. BP 130/86. CV exam normal

MPI 10/18/12: Inferolateral ischemia and fixed inferior deficit. LVEF 34%

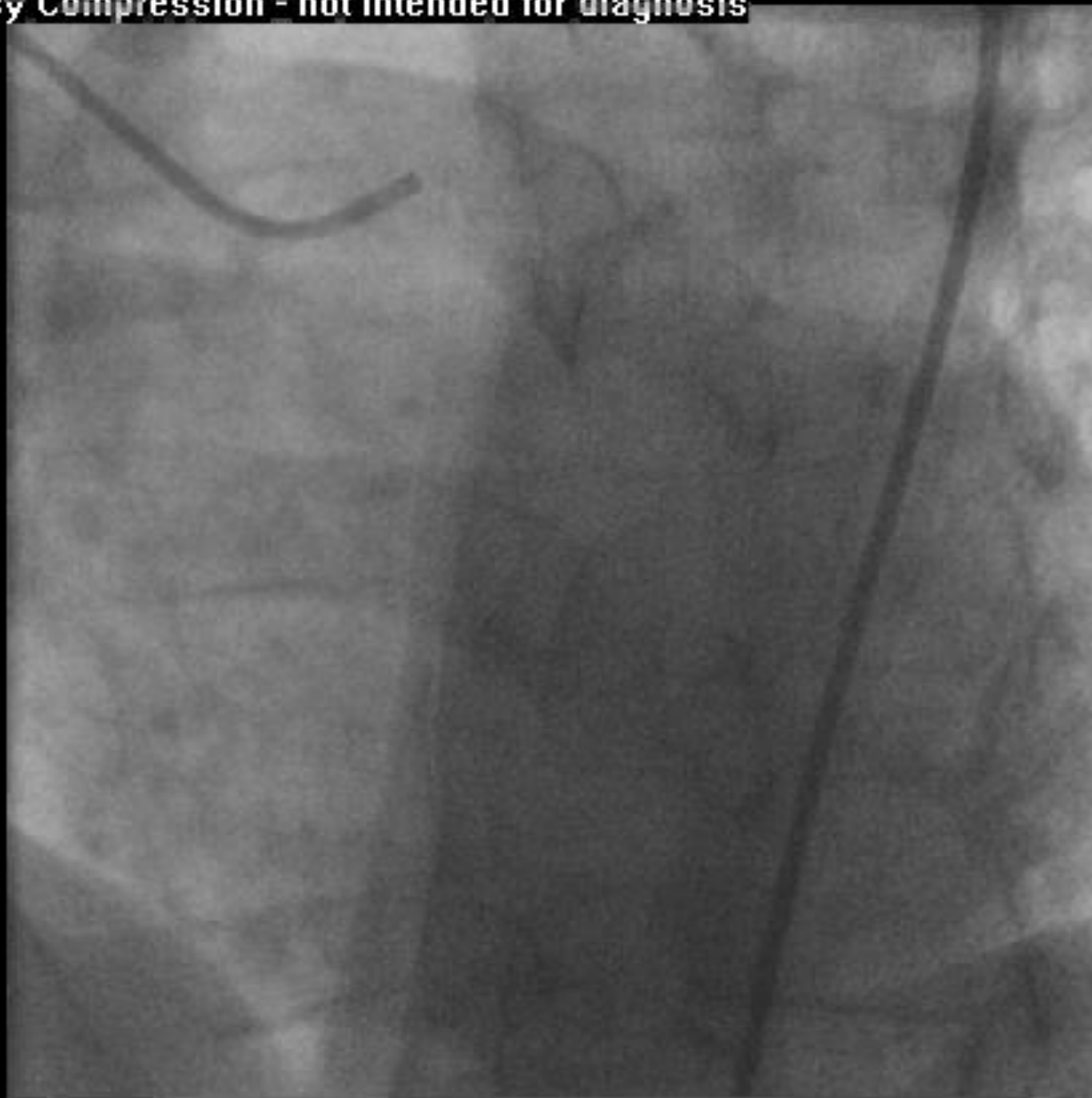
Target Vessel: CTO of RCA

Lossy Compression - not intended for diagnosis

**47-Year-
Old Male**

**Anterior
STEMI**

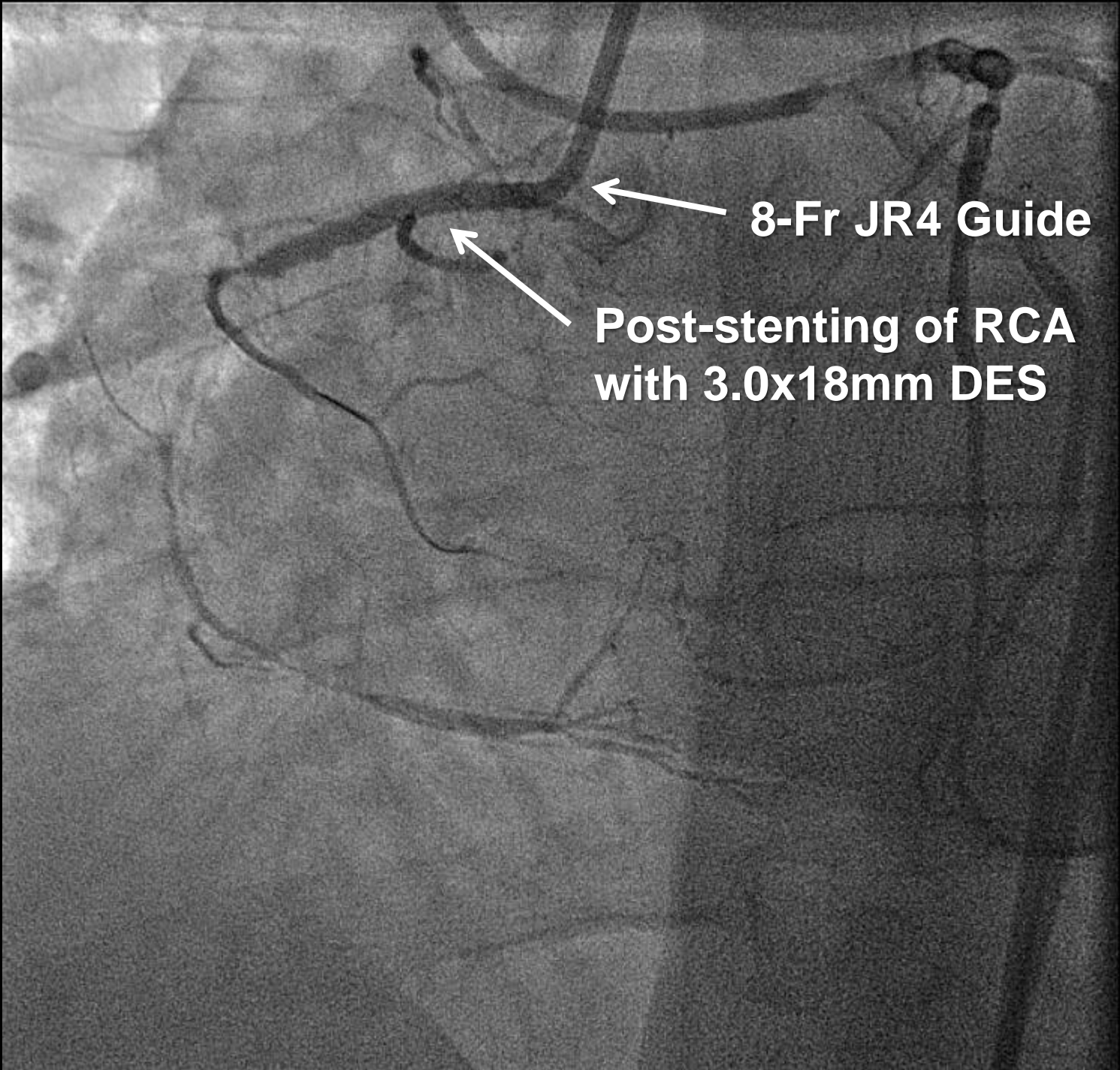
9-24-12



**47-Year-Old
Male**

**Anterior
STEMI**

**Follow-up
Angiogram
and attempt
to
recannalize
RCA CTO
2-21-13**



8-Fr JR4 Guide

**Post-stenting of RCA
with 3.0x18mm DES**

Lossy Compression - not intended for diagnosis



**47-Year-Old
Male**

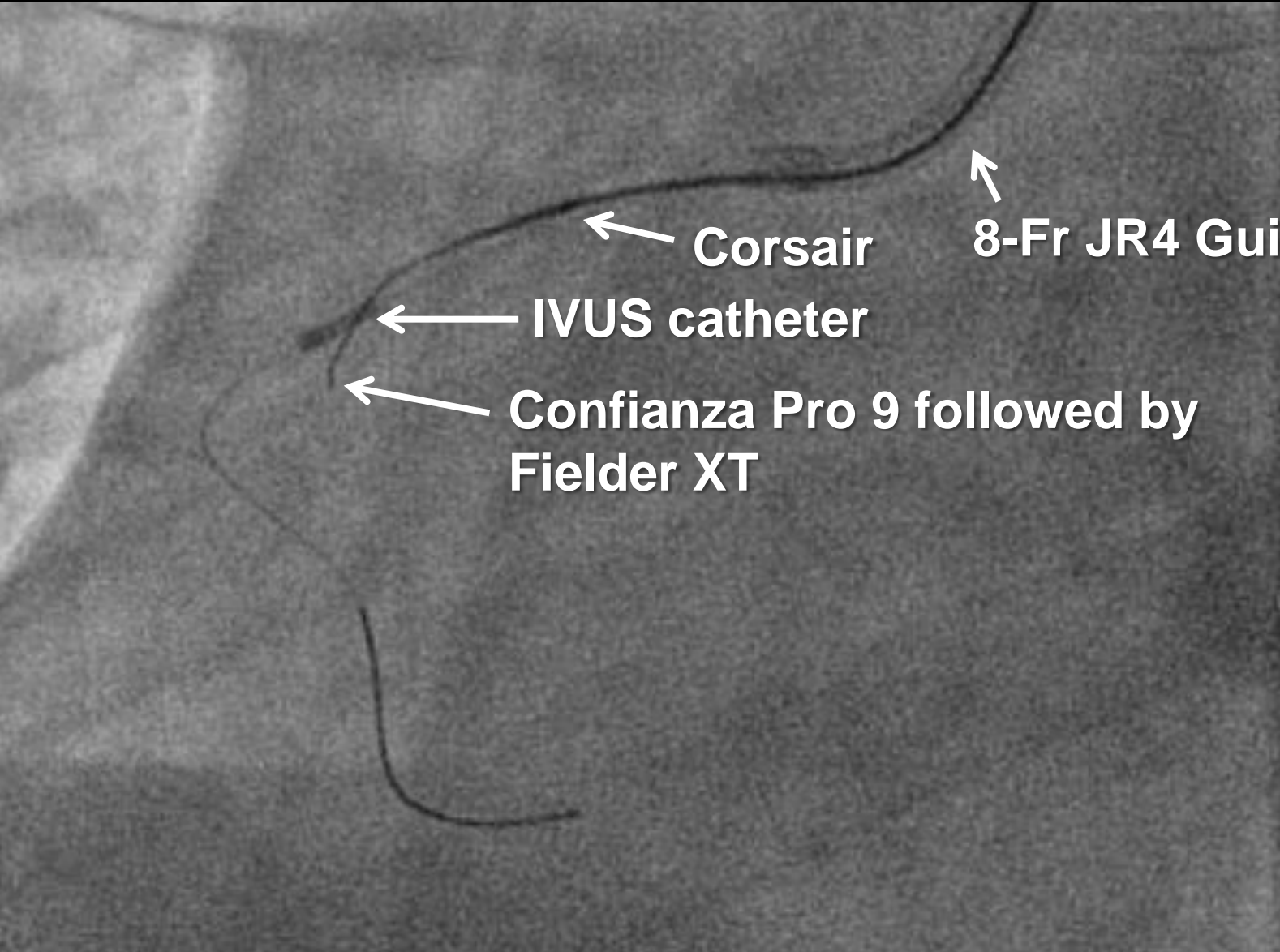
**Anterior
STEMI**

**Follow-up
Angiogram
and attempt
to
recannalize
RCA CTO
2-21-13**

**47-Year-Old
Male**

**Anterior
STEMI**

**Follow-up
Angiogram
and attempt
to
recannalize
RCA CTO
2-21-13**



← Corsair

↑ 8-Fr JR4 Guide

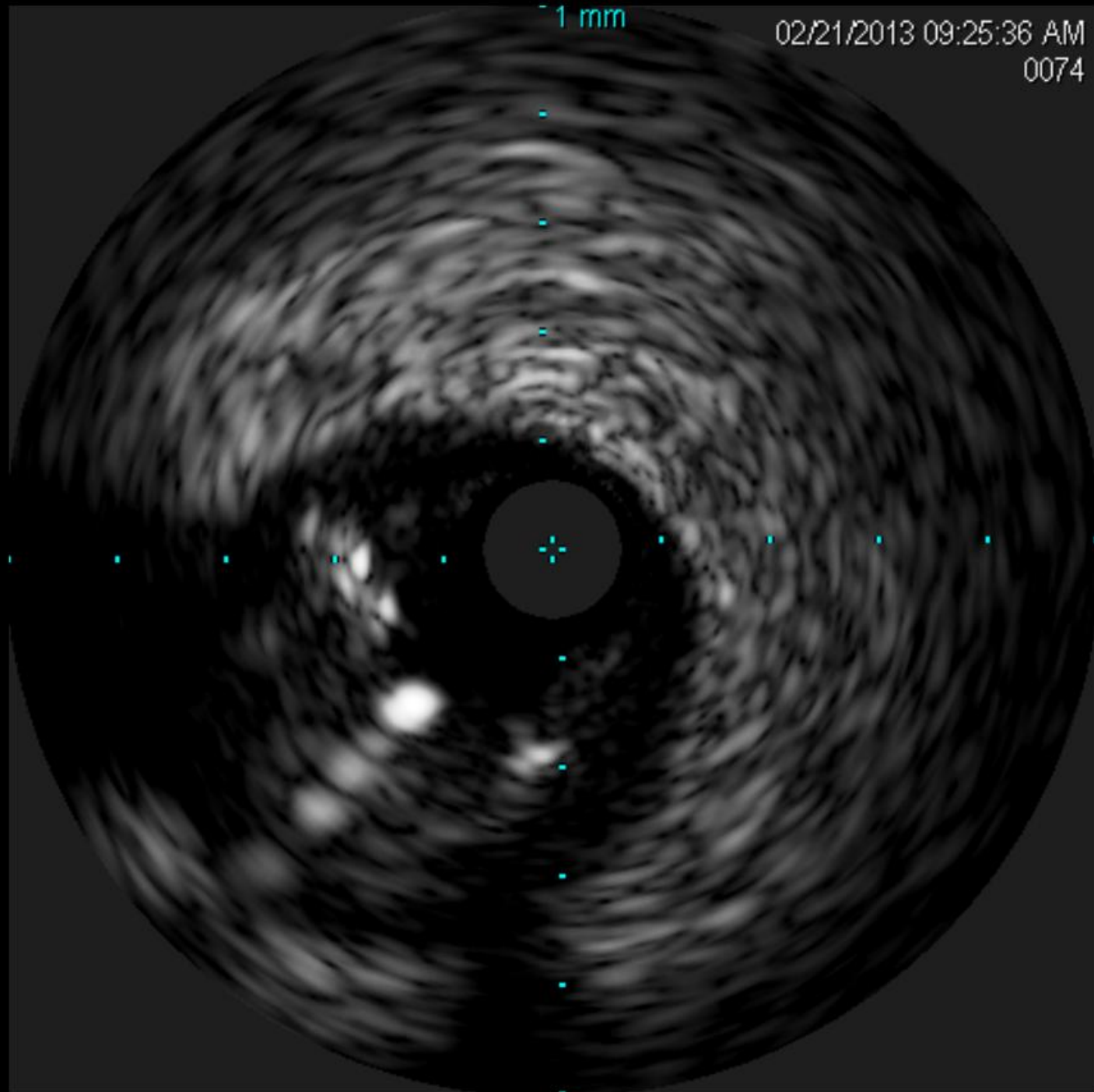
← IVUS catheter

← Confianza Pro 9 followed by
Fielder XT

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1 mm



**47-Year-Old
Male**

**Anterior
STEMI**

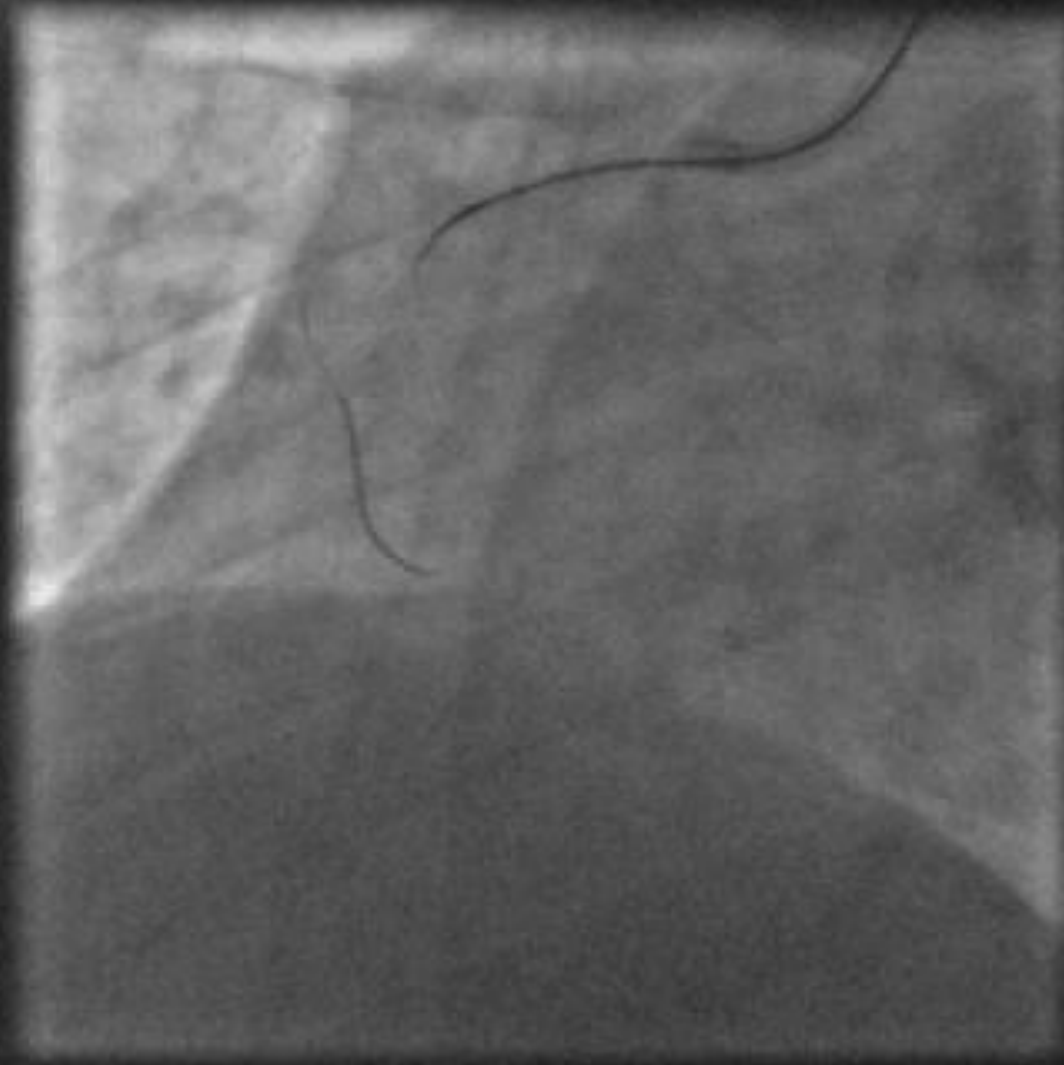
**Follow-up
Angiogram
and attempt
to
recannalize
RCA CTO
2-21-13**

Lossy Compression - not intended for diagnosis

**47-Year-Old
Male**

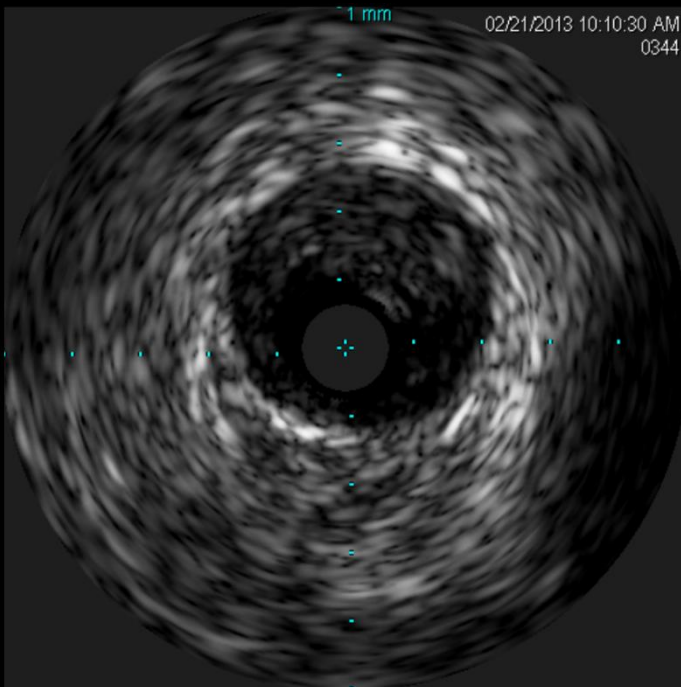
**Anterior
STEMI**

**Follow-up
Angiogram
and attempt
to
recannalize
RCA CTO
2-21-13**

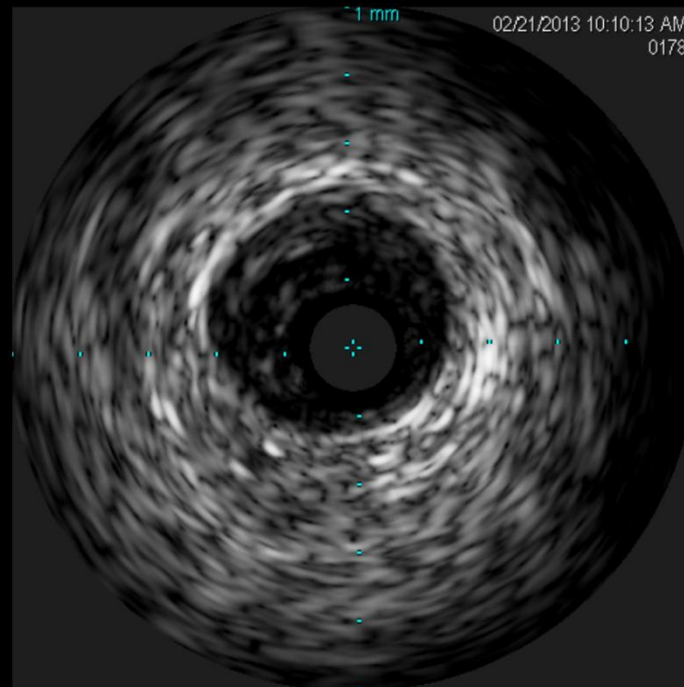


47-Year-Old Male, Anterior STEMI 2-21-13

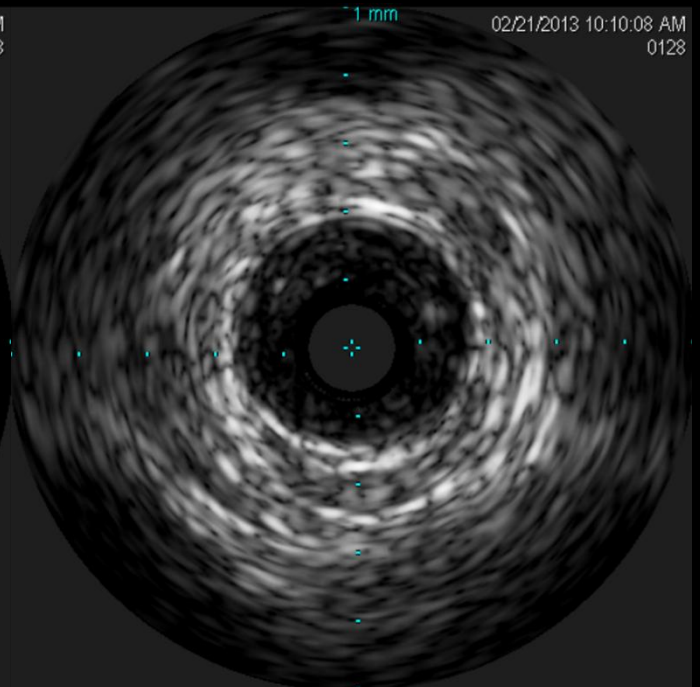
IVUS images prior to stenting



Proximal



Mid



Distal

67-Year-Old Attorney, Type 2 Diabetes *History*

07/2008: MPI stress test: localized region of ischemia, inferiorly, inferoseptally and inferolaterally; post stress EF 63%; achieved 8 METS of activity; there were no high risk prognostic markers.

Agatston Score 1328

No active symptoms, however pt. led a very sedentary existence

10/2010: Patient denies chest pain, shortness of breath, palpitations or pre-syncope, but still has very sedentary lifestyle

Risk Factors: Type 2 diabetes with complicating retinopathy, cataracts, peripheral neuropathy and renal insufficiency, Dyslipidemia, former tobacco abuse

67-Year-Old Attorney, Type 2 Diabetes

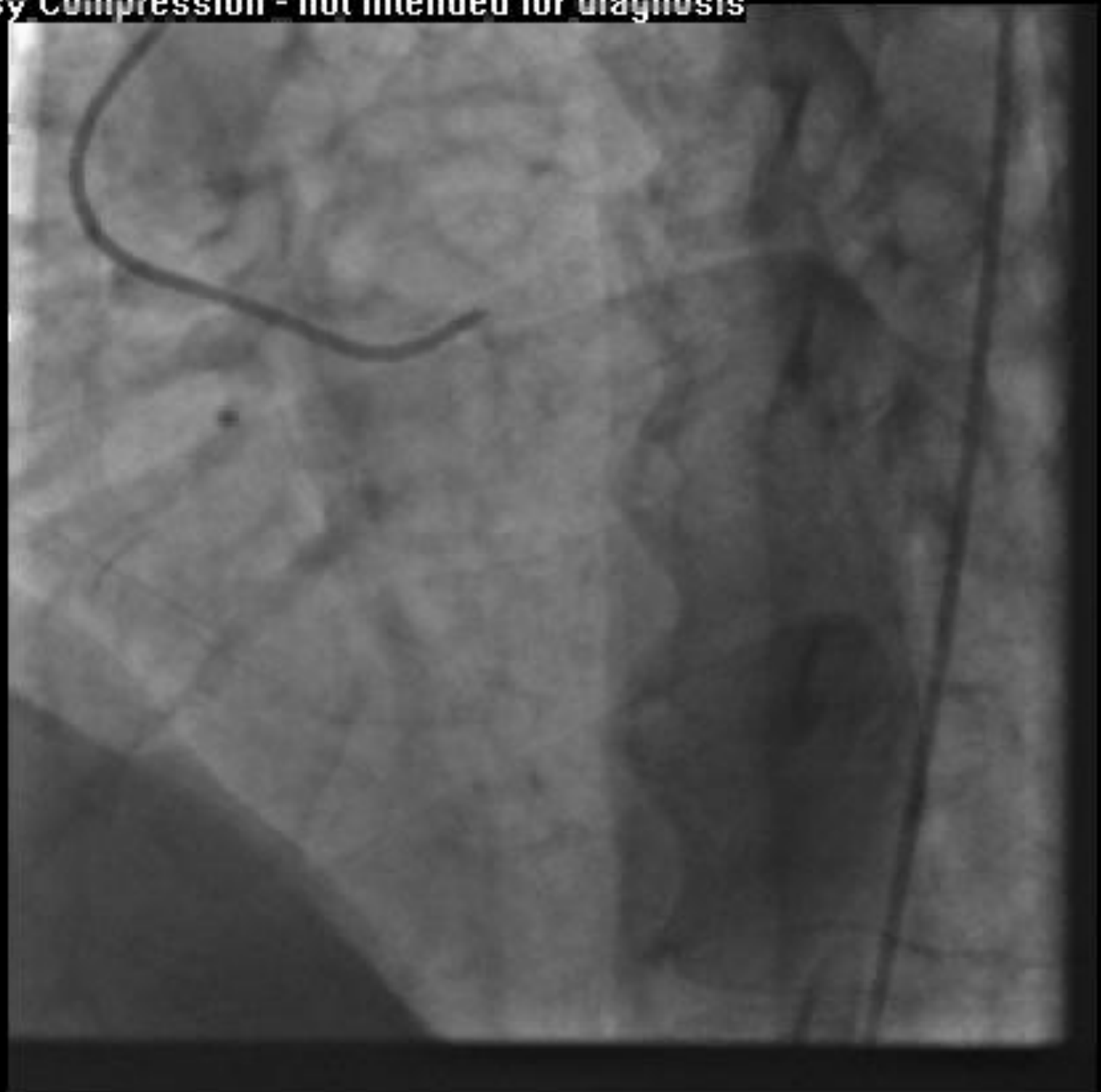
History

10/28/10: PET CT: Large area of intense ischemia, inferiorly, inferoseptally and inferolaterally; 11% of LV mass was ischemic, 9% infarcted
Post stress EF fell to 49% with akinesis developing throughout the inferior, inferoseptal and inferolateral walls with transient dilatation of the LV
The ischemic burden and LV decompensation are significantly worse compared to the study of 2008

**67-Year-Old
Attorney,
Type 2
Diabetes**

**Diagnostic
Angiogram
11-17-10**

**Stenting of
LAD and
LCX-OM**



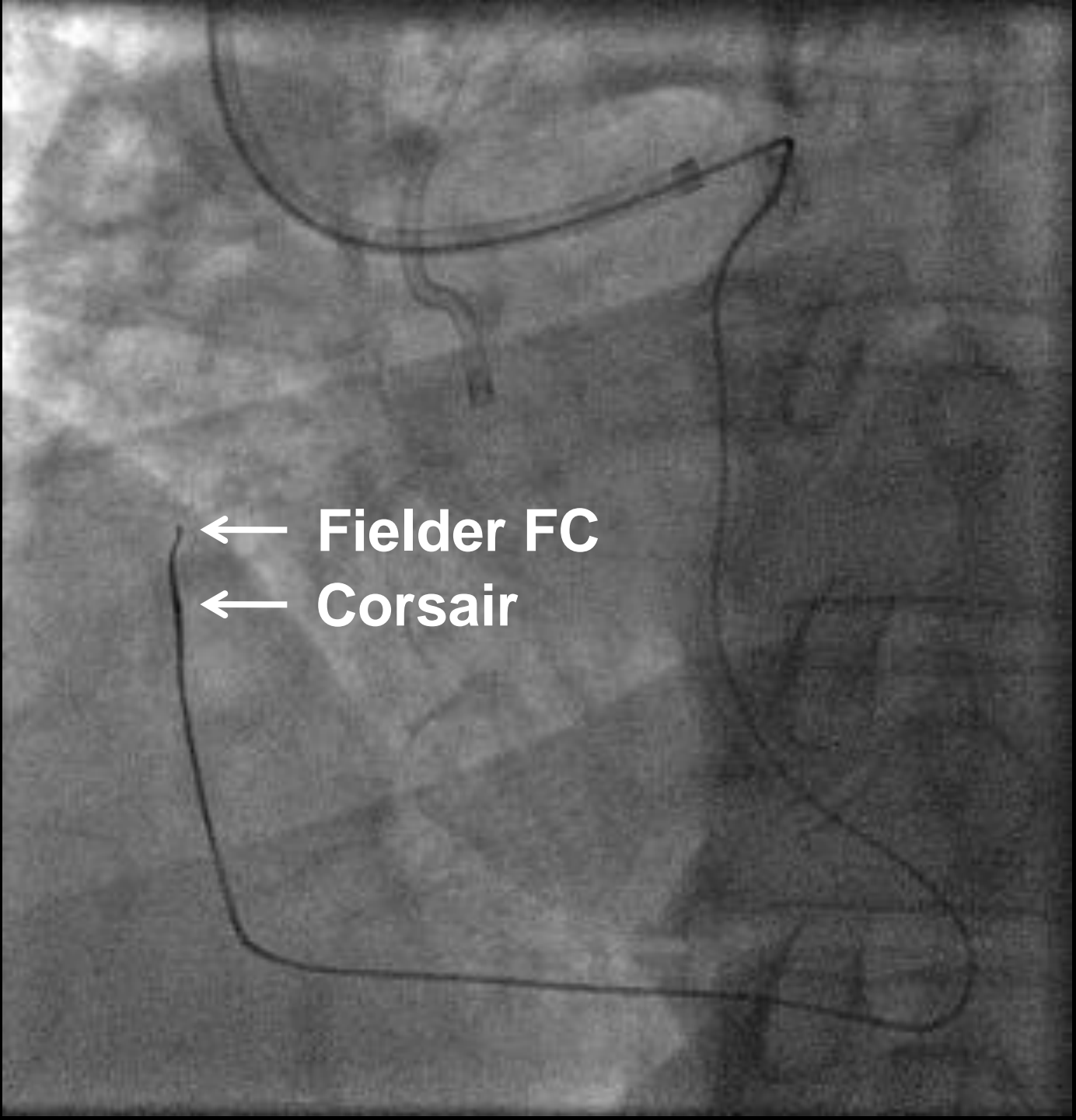


**67-Year-Old
Attorney,
Type 2
Diabetes**

**Stenting of
RCA CTO
12-8-10**

**67-Year-Old
Attorney,
Type 2
Diabetes**

**Stenting of
RCA CTO
12-8-10**

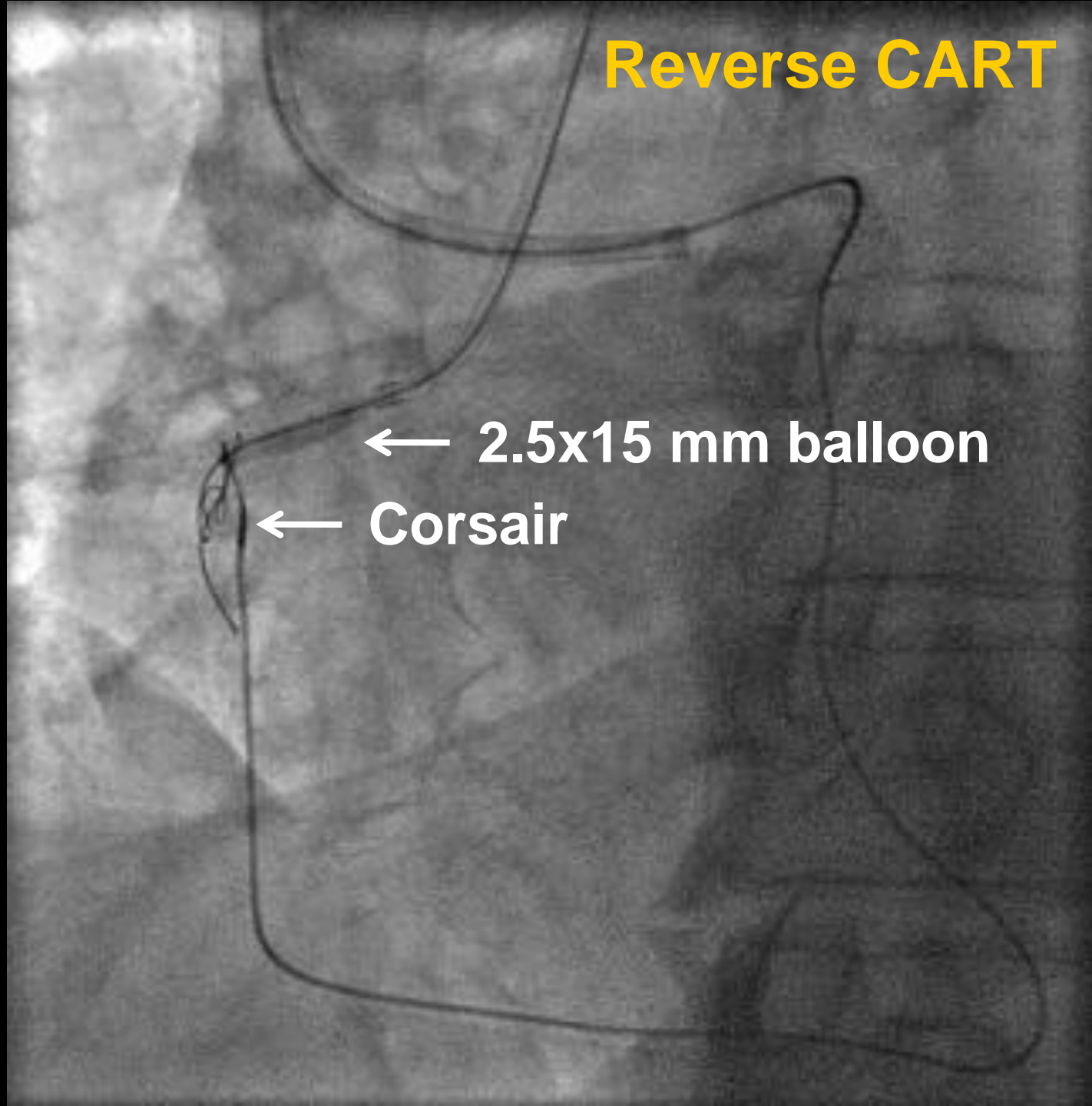


← Fielder FC
← Corsair

Reverse CART

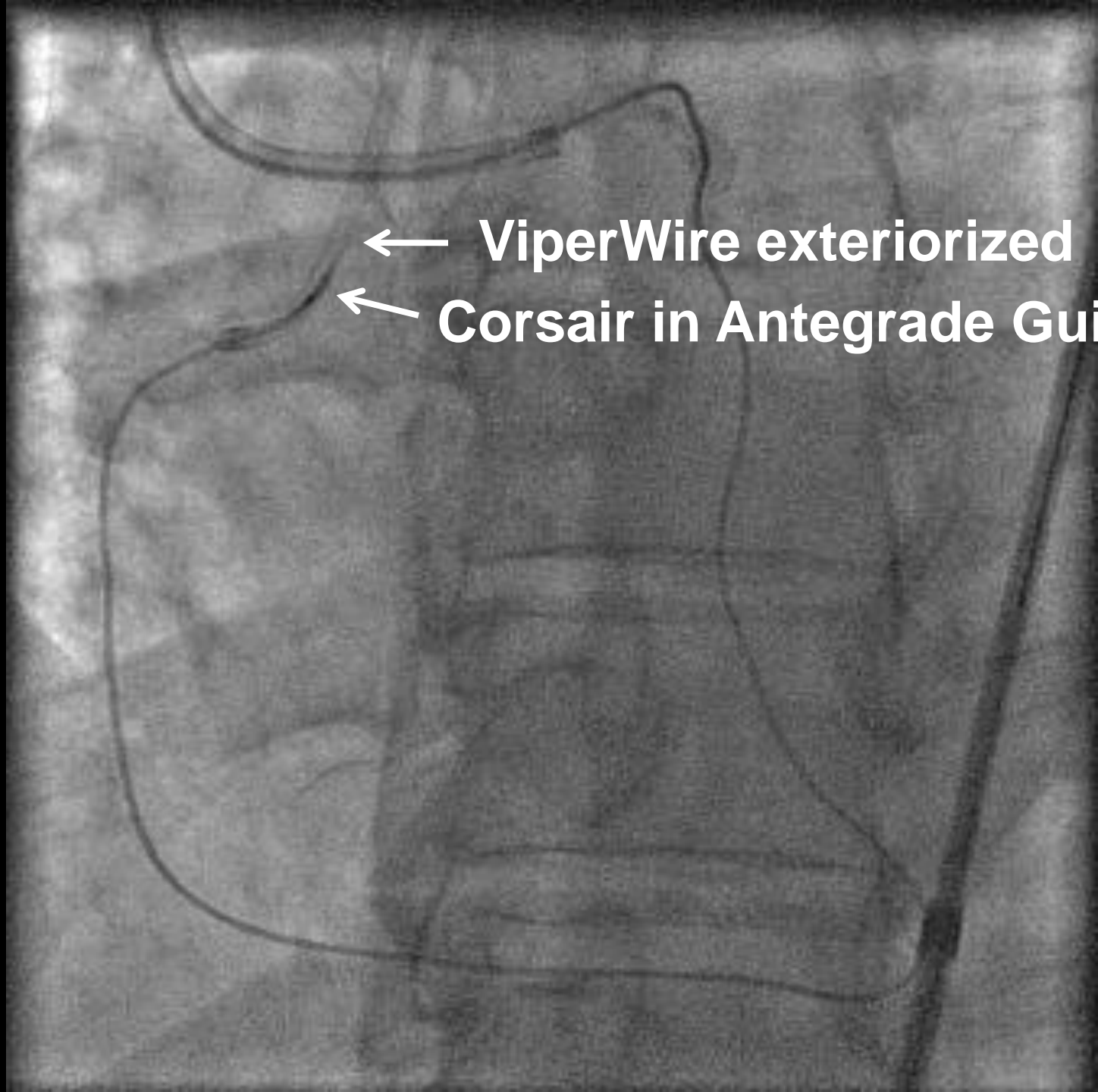
**67-Year-Old
Attorney,
Type 2
Diabetes**

**Stenting of
RCA CTO
12-8-10**



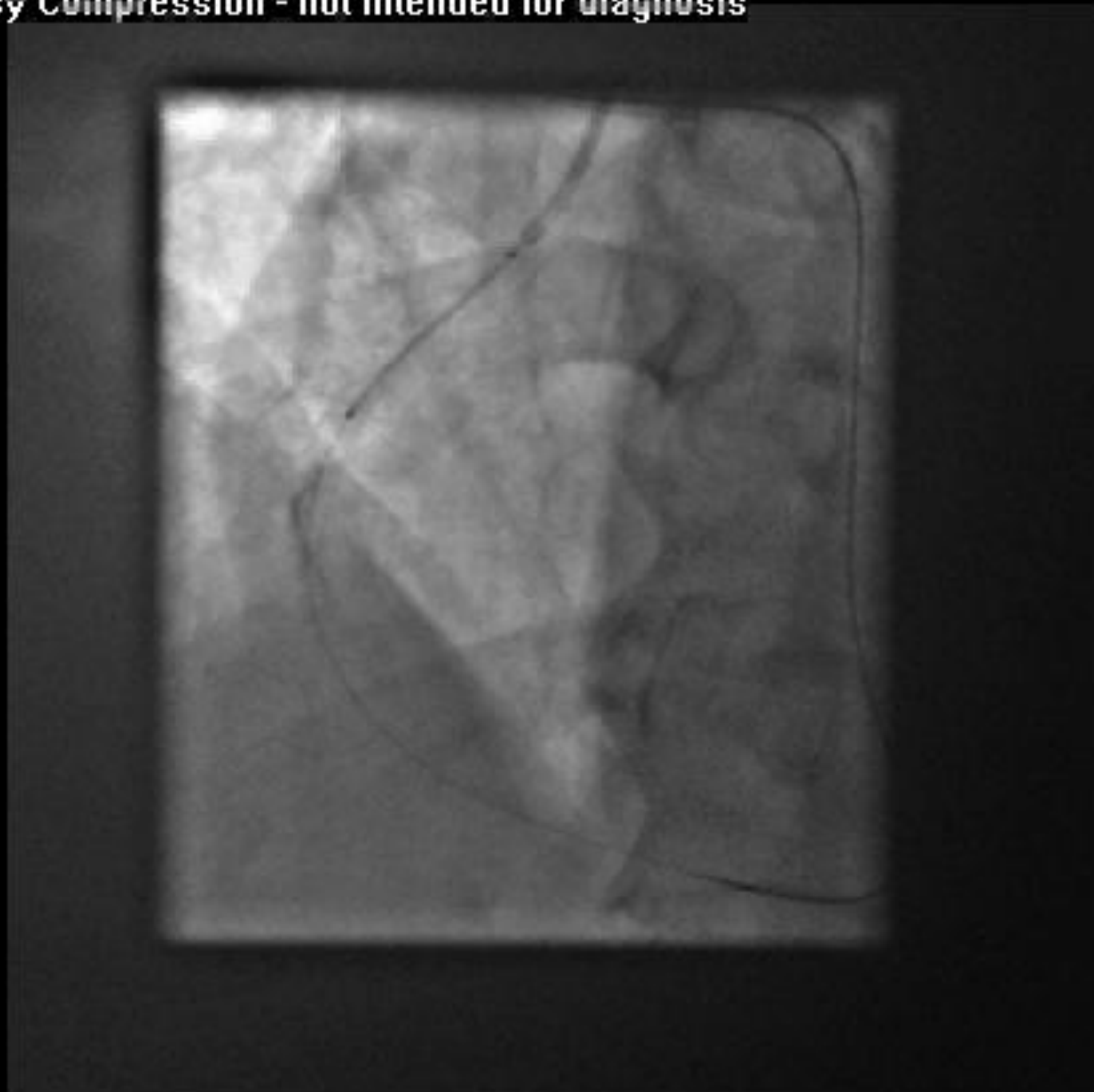
**67-Year-Old
Attorney,
Type 2
Diabetes**

**Stenting of
RCA CTO
12-8-10**



← ViperWire exteriorized
← Corsair in Antegrade Guide

Lossy Compression - not intended for diagnosis



**67-Year-Old
Attorney,
Type 2
Diabetes**

**Stenting of
RCA CTO
12-8-10**

67-Year-Old Attorney, Type 2 Diabetes

Follow-up: 14 Months

11/2011: Coronary SPECT: No significant residual ischemia; normal global and regional LV systolic function; Post stress EF >75%; achieved 10.4 METS. No LV dilatation post stress.

Patient now exercising 1-2 hours per day;

Weight decreased 25 lbs

No chest pain, shortness of breath or other cardiac symptoms

67-Year-Old Attorney, Type 2 Diabetes
Follow-up: 14 months

“Doc, I wanted you to call my plastic surgeon because I’m feeling so good that I’m going to have a facelift and I want you to discuss the Plavix therapy with him”

Indications for CTO Recanalization

Evaluation of LV Function:

Pre cardiac transplantation

Pre ICD evaluation

Surgical turndown

76-Year-Old Male

CTO of RCA & LAD

History:

Dec. 2012: Severe ischemic cardiomyopathy

12/20/12: Cardiac MR

- Severely reduced LV function. LVEF 11%
- Akinetic septal and apical segments
- Markedly dilated LV (LVEDVI=129.6 ml/m²)
- Transmural infarct of mid to apical septal segments
- Transmural infarct of the inferoapical segment
- All other walls are viable

Past History & Risk Factors:

Type 2 DM, Dyslipidemia, Former tobacco abuse,
Previous CVA

Medications:

Lisinopril 5mg qd; Spironolactone 25mg qd; Torsemide 20mg qd;
Pravastatin 80mg qd; Metoprolol 12.5mg qd; Nitrostat prn.

Exam:

5'3", 134 lbs. BP 110/60. S4 gallop, no murmurs

Cor Angio 12/19/12:

Severe 3VD. CTO of LAD and RCA. Surgical turndown.

Target Vessel:

CTO of RCA

Lossy Compression - not intended for diagnosis

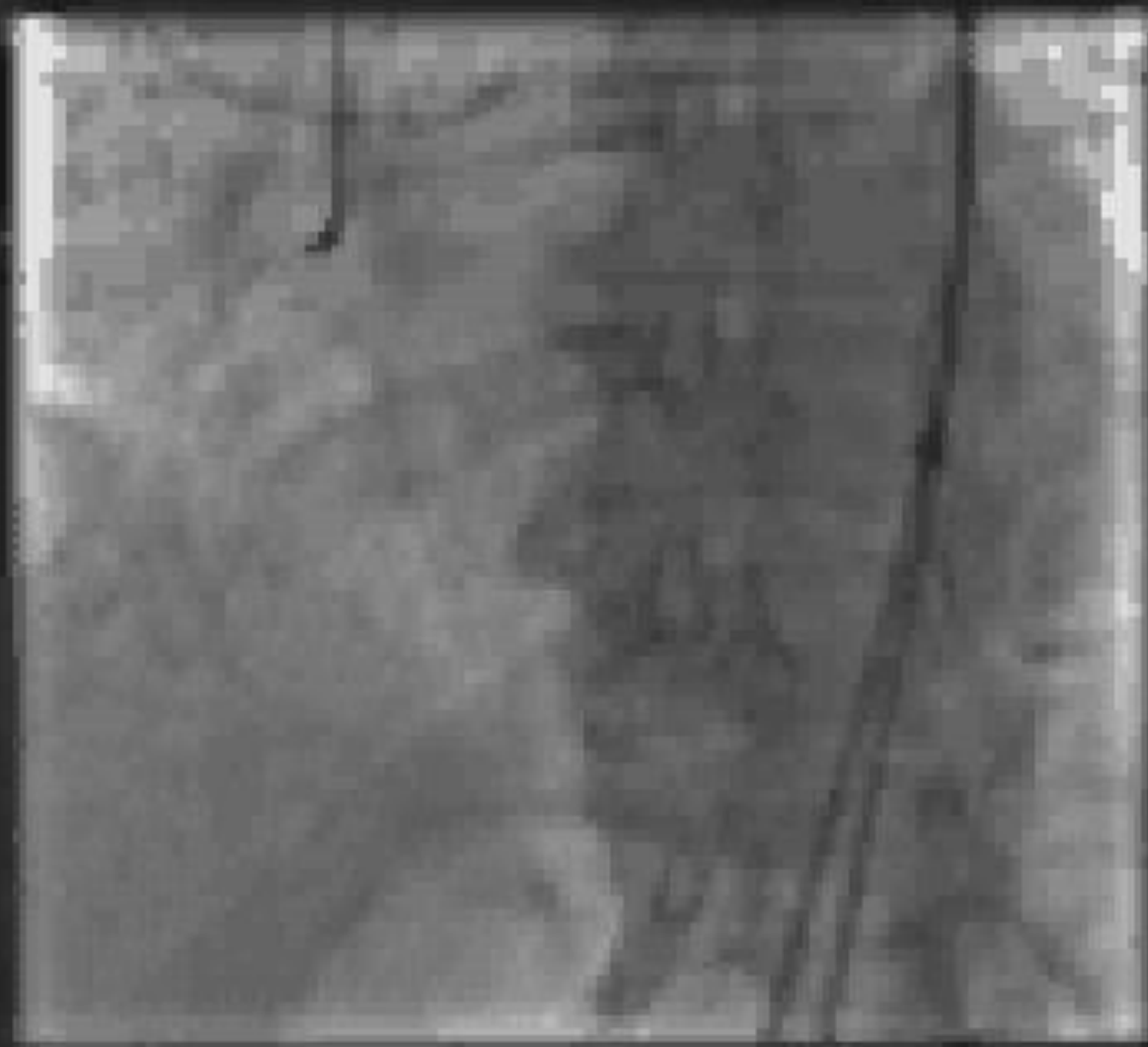


**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

12/19/12

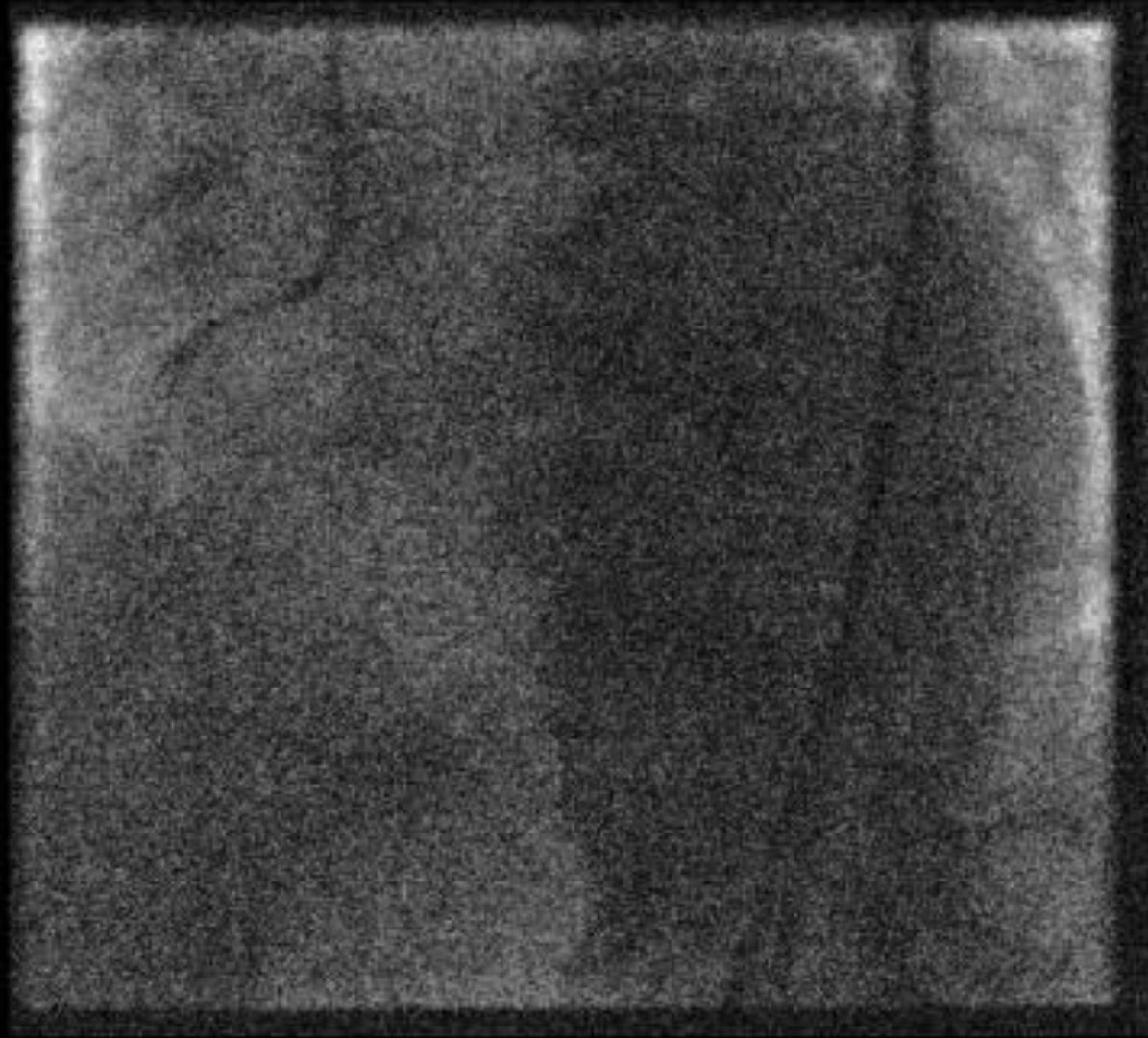


**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13



**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13

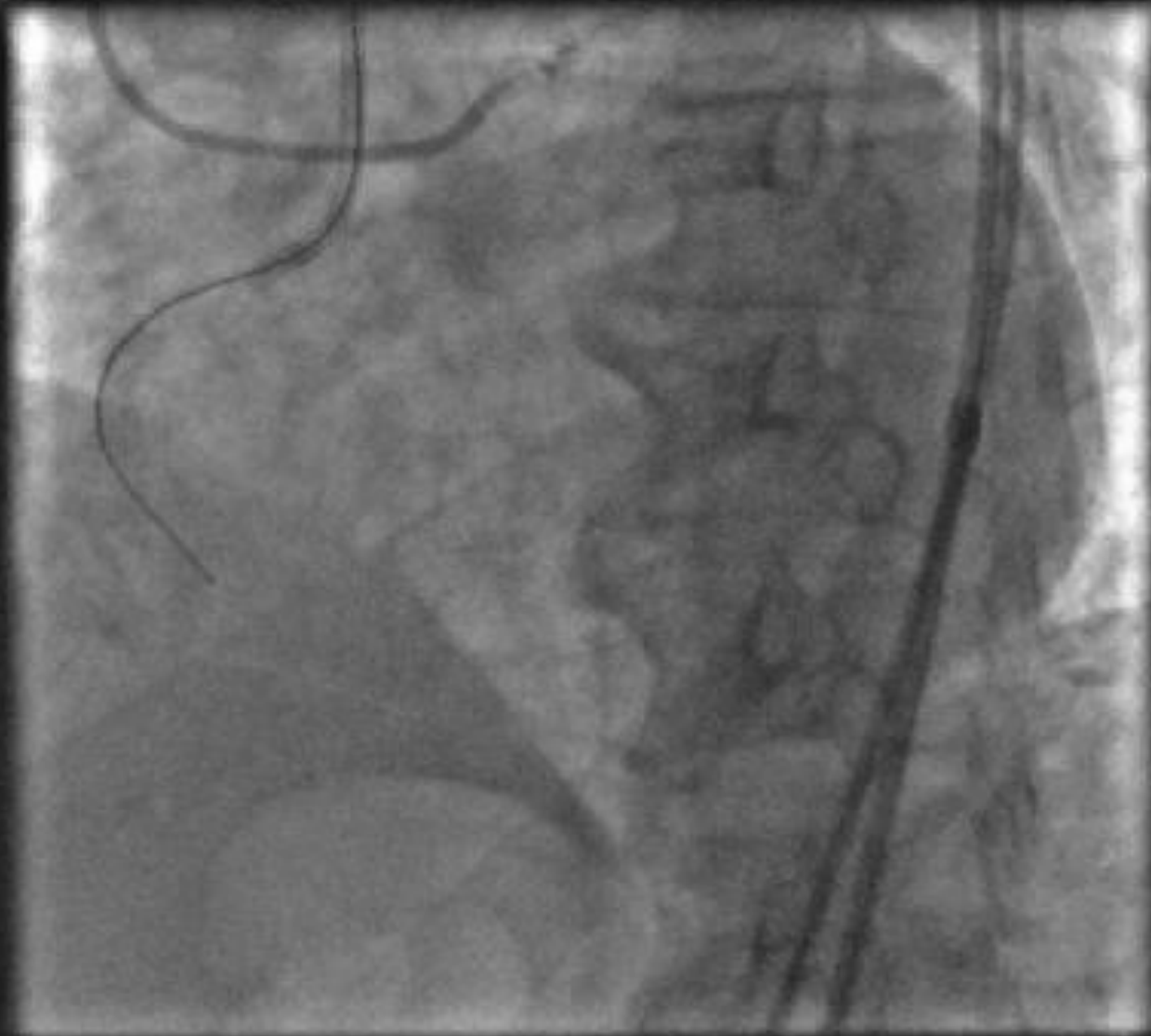
Lossy Compression - not intended for diagnosis

**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13

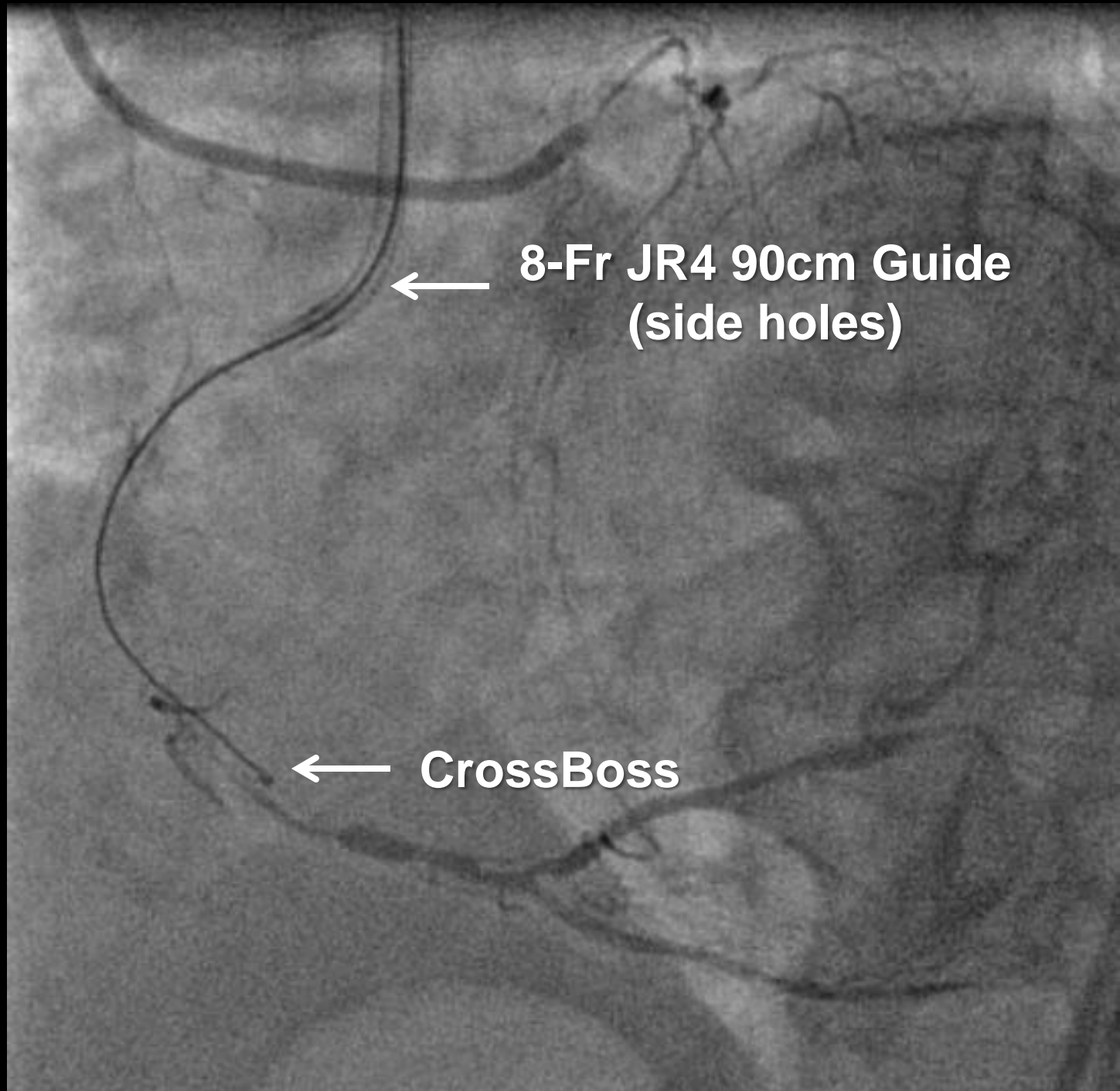


**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13



← **8-Fr JR4 90cm Guide
(side holes)**

← **CrossBoss**

Lossy Compression - not intended for diagnosis

**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13

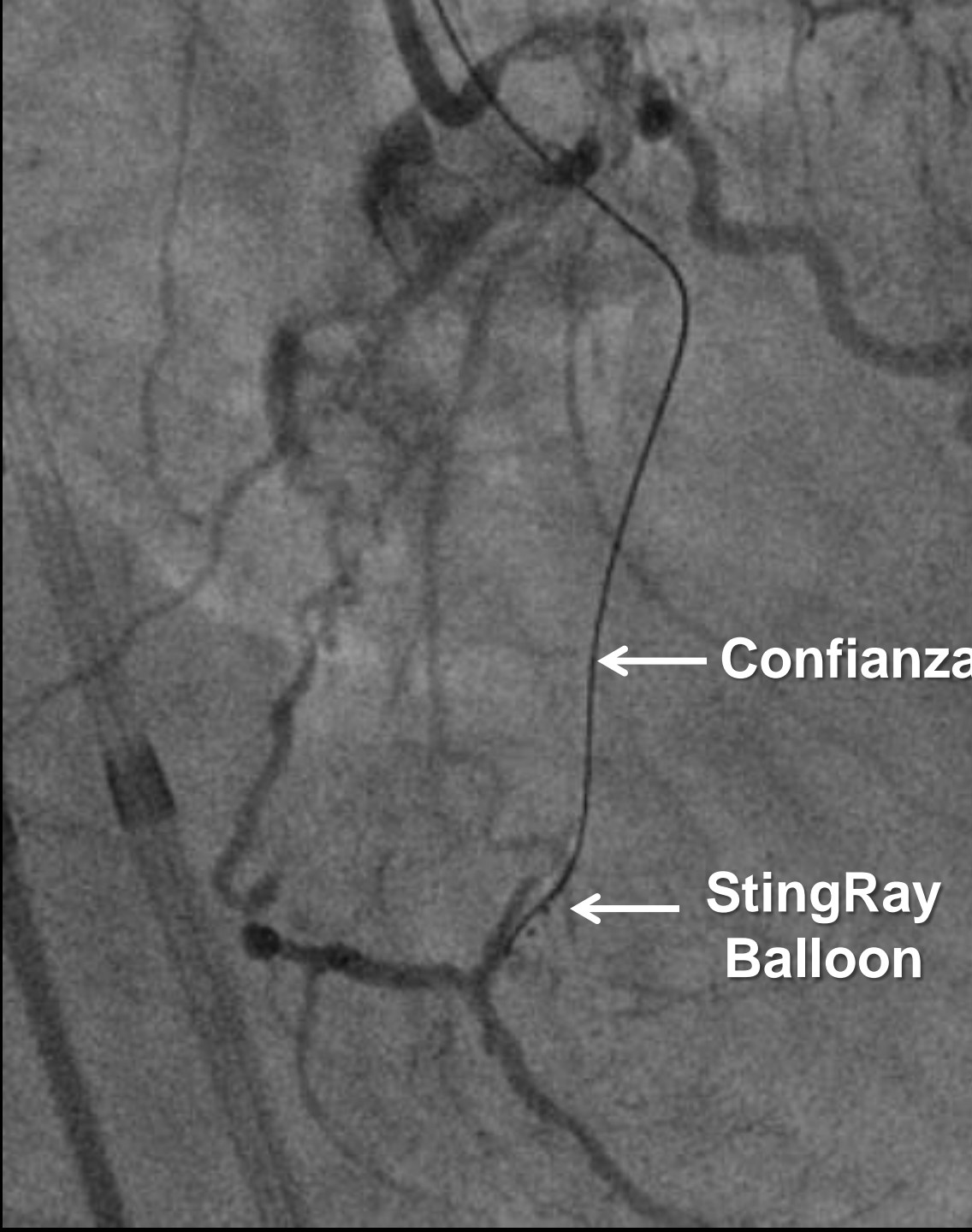


**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13



← **Confianza Pro 9**

← **StingRay
Balloon**

Lesion Compression - not intended for diagnosis



**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

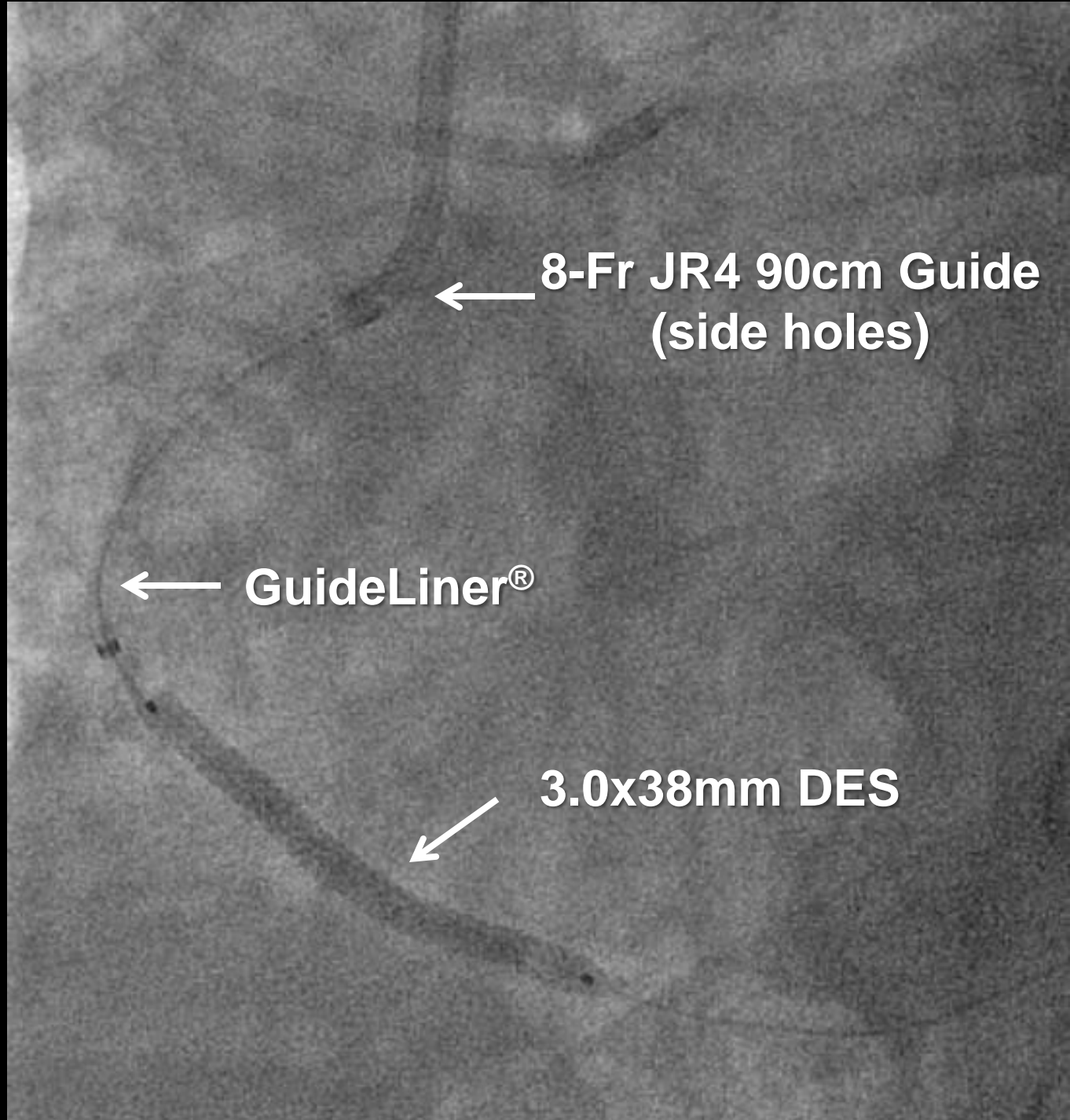
2/22/13

**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13



← 8-Fr JR4 90cm Guide
(side holes)

← GuideLiner®

← 3.0x38mm DES

Lossy Compression - not intended for diagnosis



**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13

Lossy Compression - not intended for diagnosis

1 mm

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**76-Year-Old
Male**

**CTO of
RCA & LAD**

LVEF 30%

2/22/13

**IVUS
following
Stingray
Balloon**



59-Year-Old Industrial Hygienist

04/2010: Presented to local hospital following a fall and then developed severe shortness of breath & diaphoresis
Extensive right lower DVT and bilateral pulm emboli
LVEF on echocardiogram 19%
Factor V Leiden mutation

4/28/10: Diagnostic Cor Angio: Severe TVD and LVEF 10%

PET CT Transmural injury inferiorly in the distribution of the
6/1/10: RCA and possibly a portion of LCX
Ischemia and co-mingled injury in LAD distribution
Rest viability study with FDG: fixed perfusion and metabolic defect inferiorly and inferolaterally
EF 18%, no significant viability

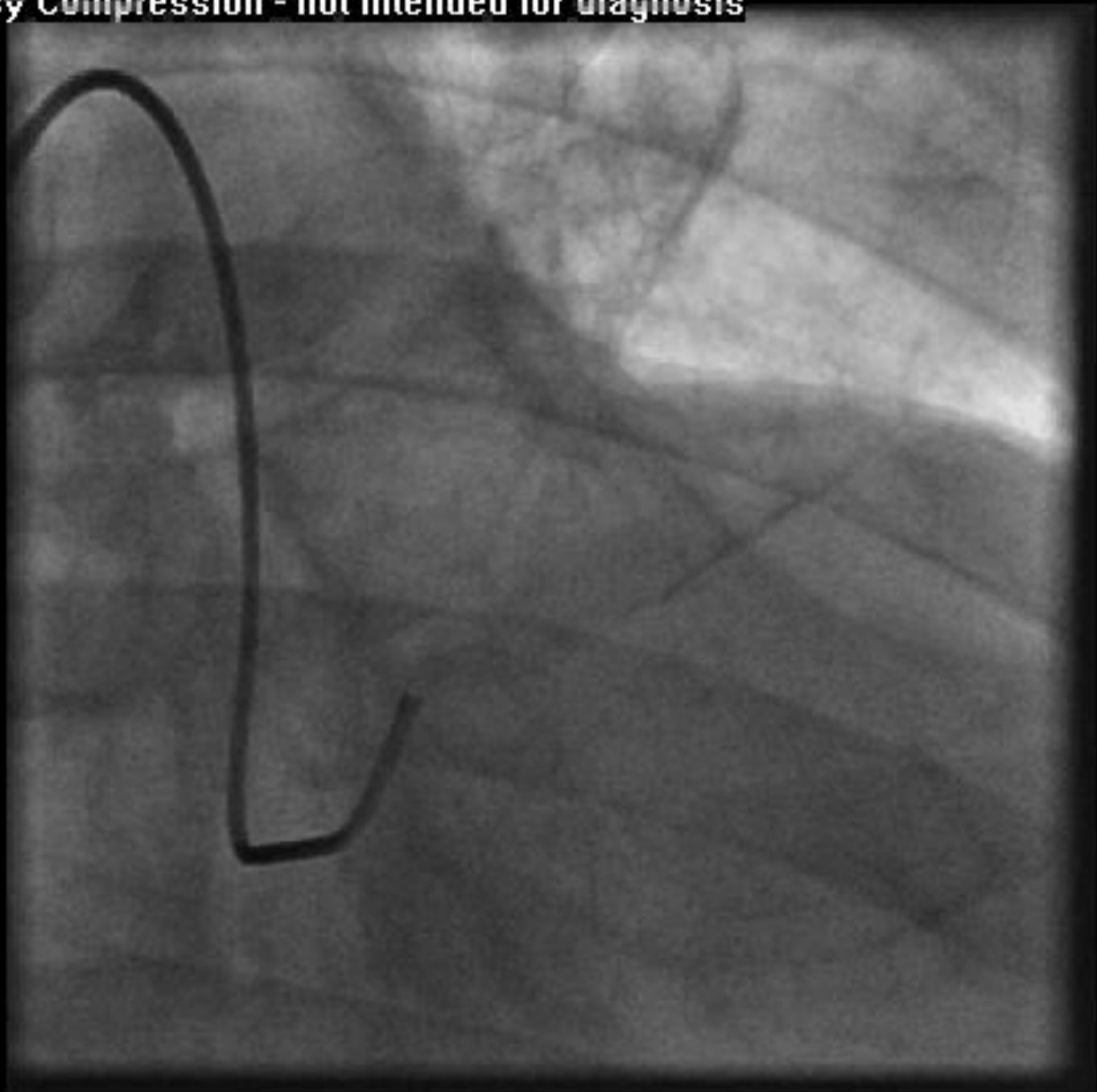
Surgical Surgical turndown, refer to cardiac transplant
Consult: service and EP service for possible ICD

Lossy Compression - not intended for diagnosis

**59-Year-
Old Male**

**Diagnostic
Angiogram**

4/28/10



59-Year-Old Industrial Hygienist

- **Heart Failure and Cardiac transplant service:**

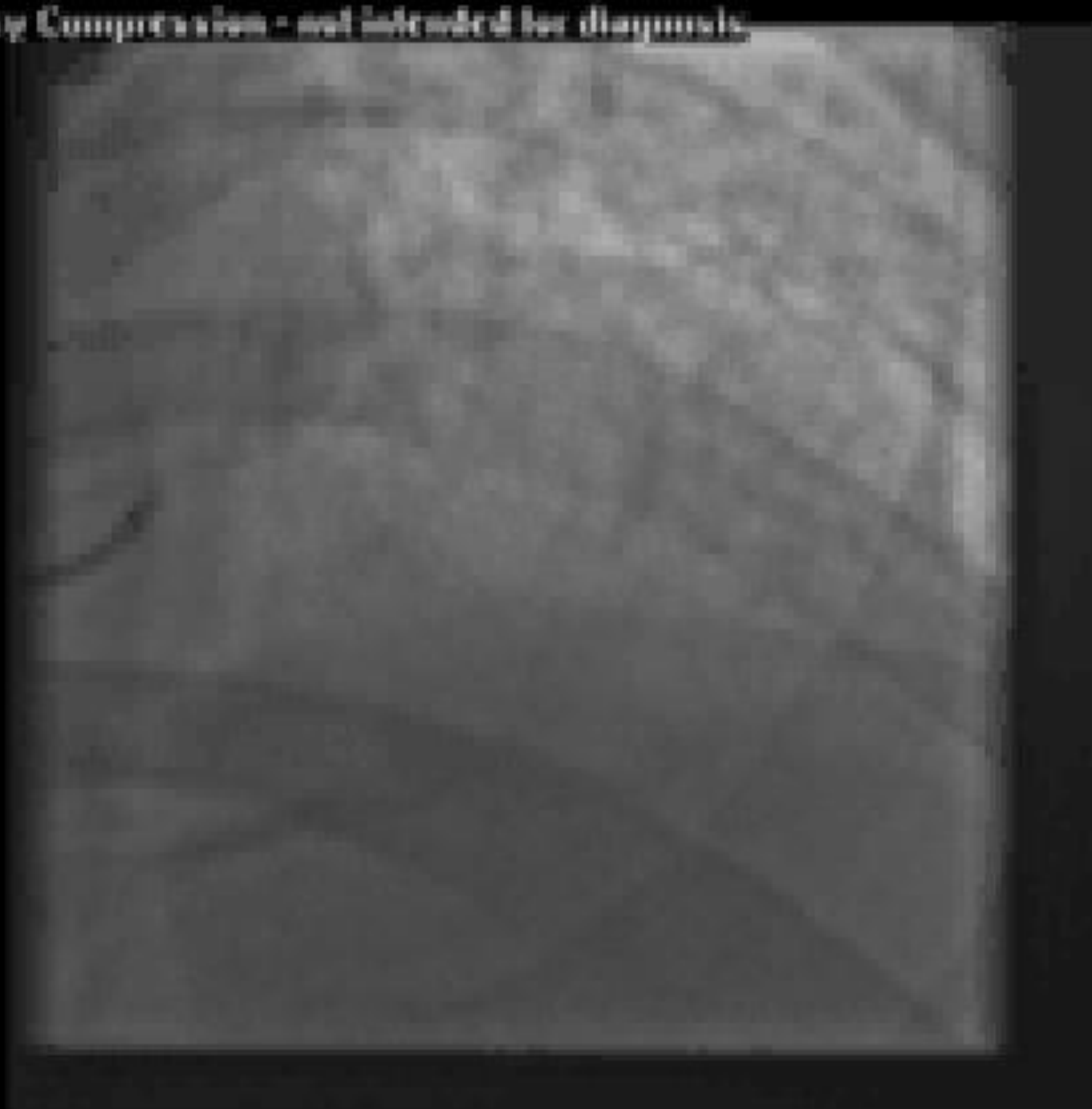
“have Dr’s Rutherford and Grantham review the angiogram for possible revascularization”

- **ICD not recommended at this time**

**59-Year-
Old Male**

**Stenting
of LAD
and LCX**

6-30-10

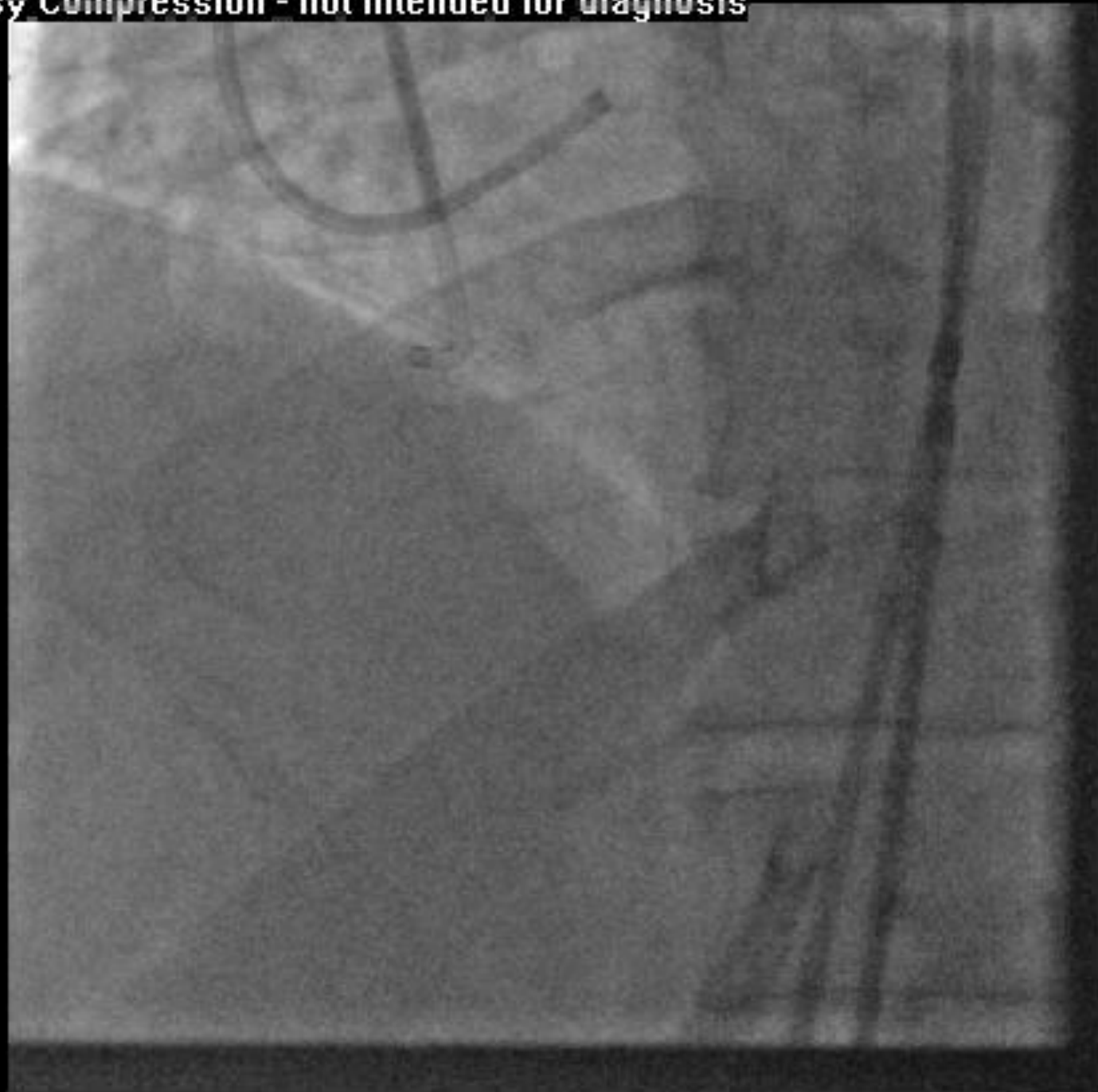


Lossy Compression - not intended for diagnosis

**59-Year-
Old Male**

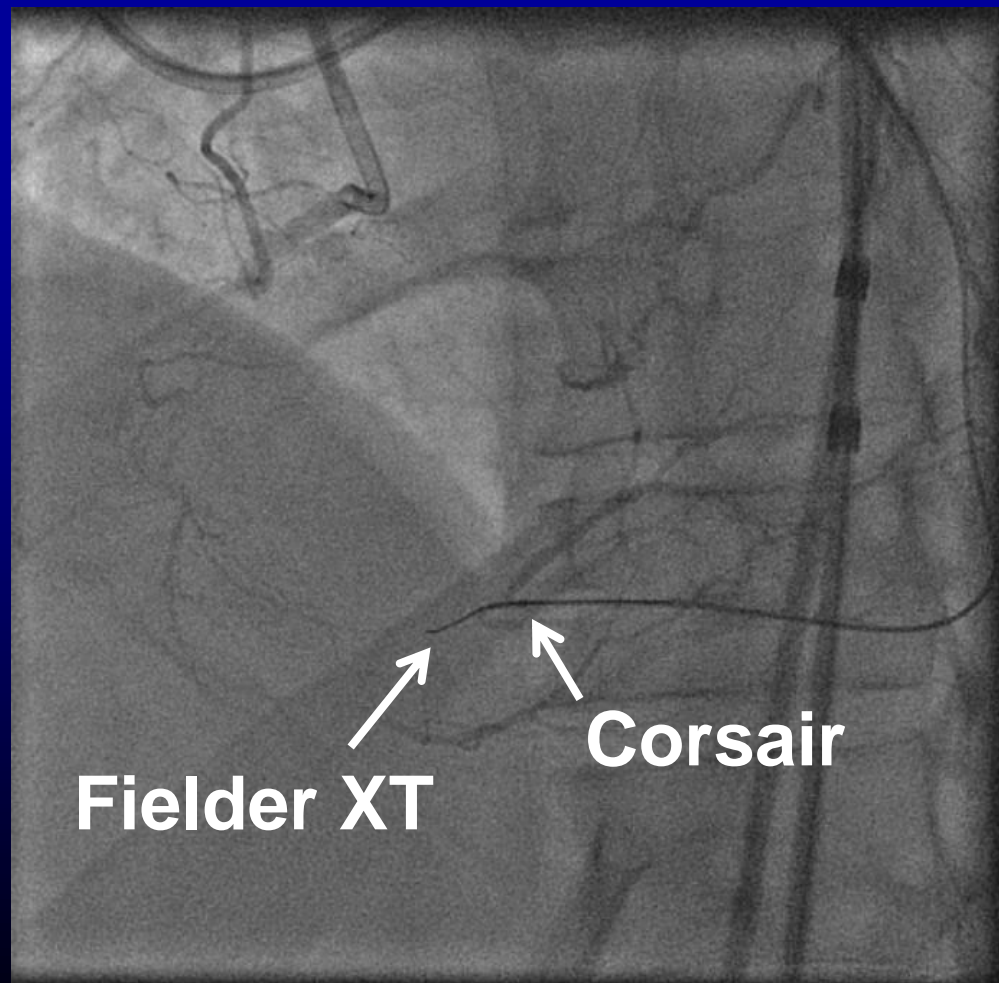
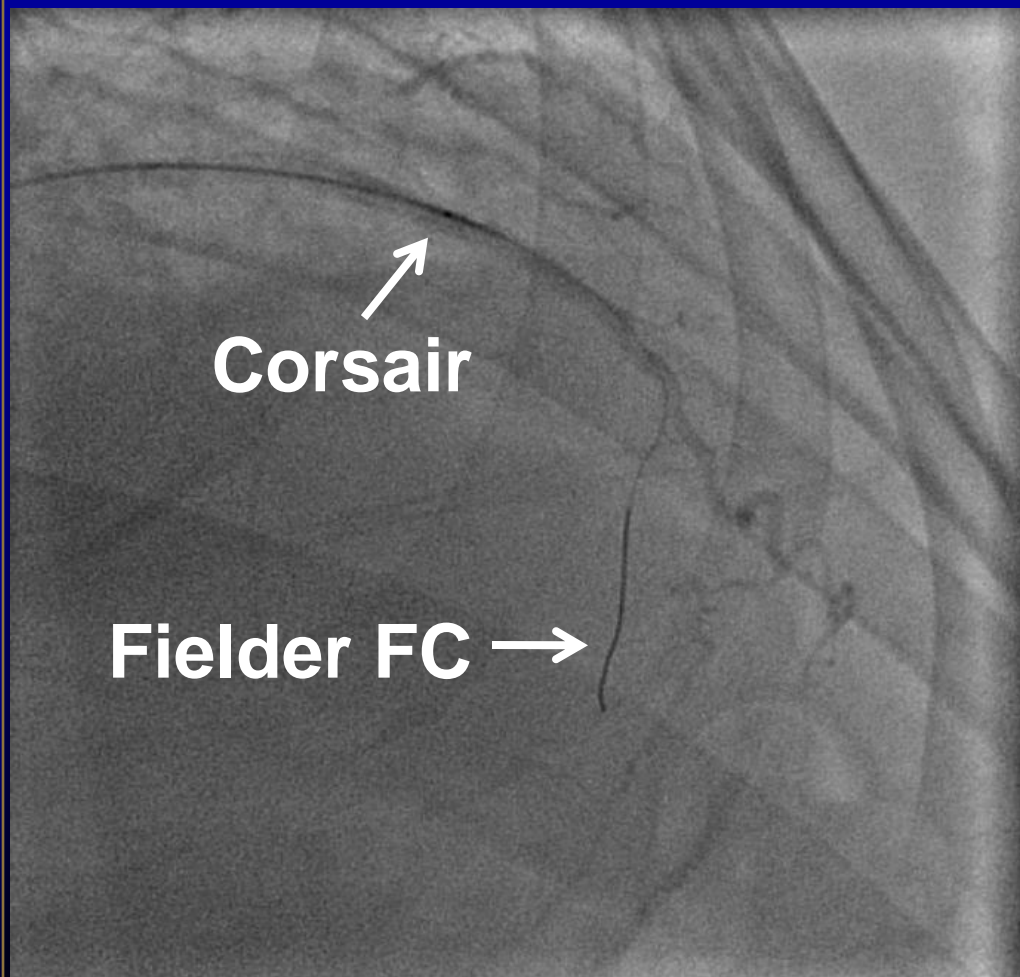
**Stenting
of RCA
CTO**

8-31-10



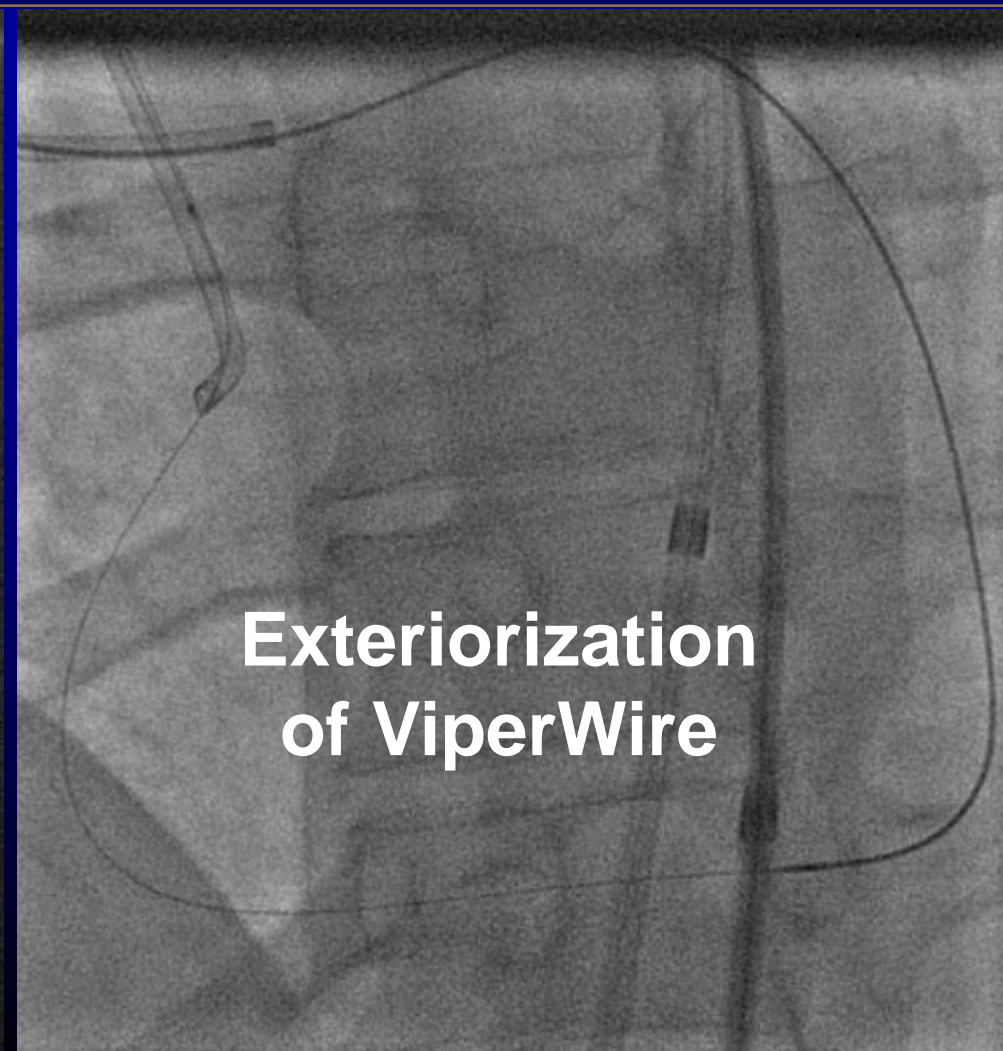
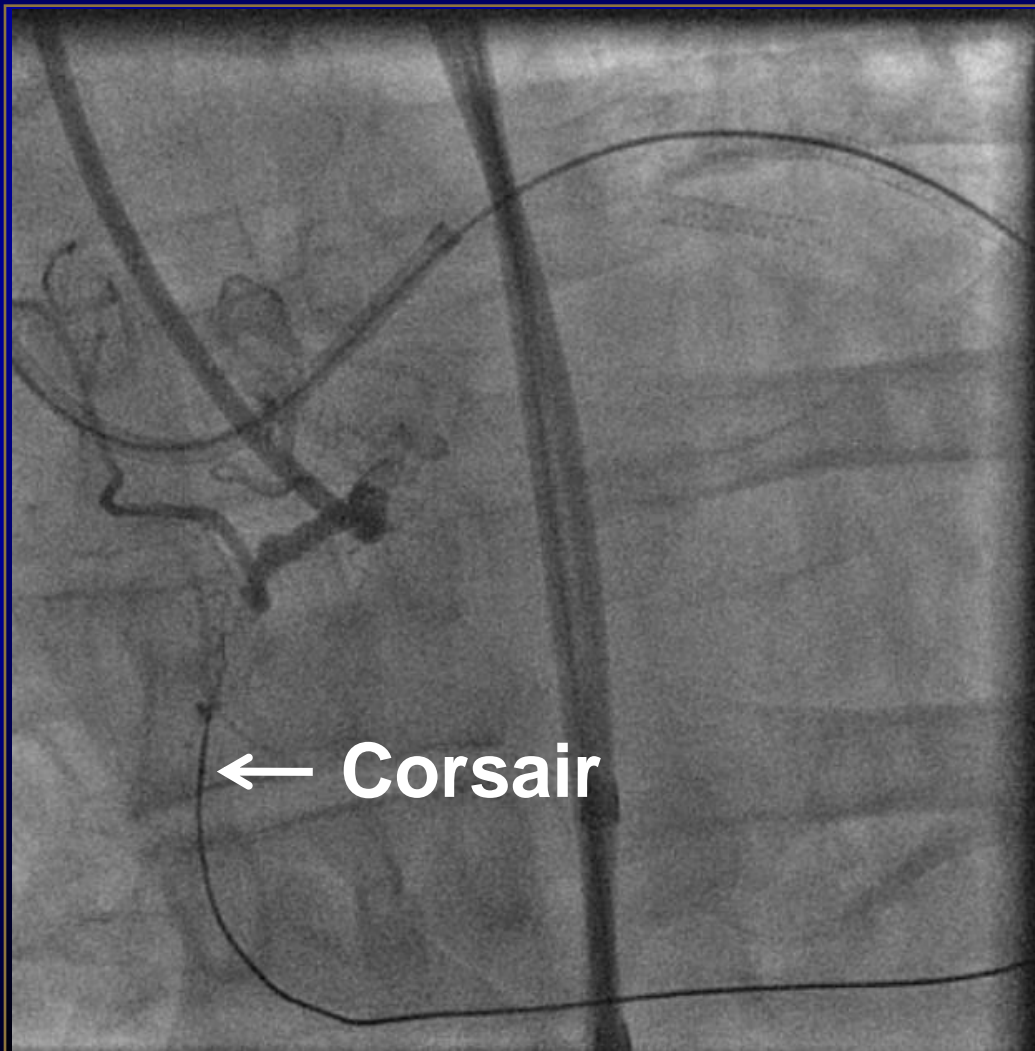
59-Year-Old Male

Stenting of RCA CTO 8-31-10



59-Year-Old Male

Stenting of RCA CTO 8-31-10

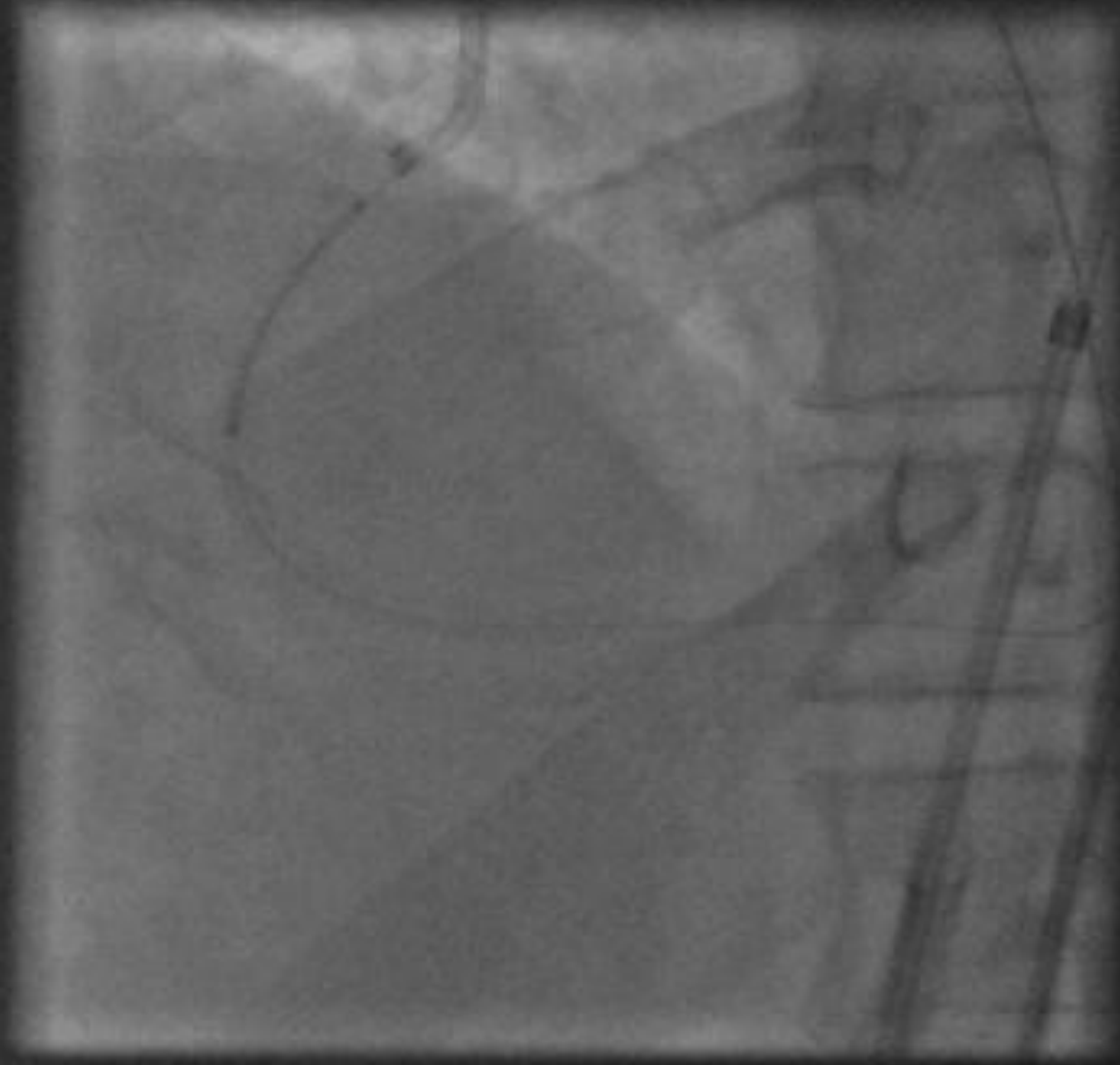


Lossy Compression - not intended for diagnosis

**59-Year-
Old Male**

**Stenting
of RCA
CTO**

8-31-10



59-Year-Old Industrial Hygienist

Follow-Up: 18 Months

01/2012: Patient exercising on a regular basis without symptoms and working full time.
No shortness of breath or retrosternal chest pain.

LVEF by echocardiogram 35%

No need for consideration of ICD or cardiac transplantation at this time

Meds: Carvedilol 25 mg bid; Lisinopril 10 mg qd;
Zocor 40 mg qd; Plavix 75 mg qd;
ASA 81 mg qd; Warfarin as directed

69-Year-Old Male

History:

1989: CABG: LIMA-LAD, SVG-LCX, SVG-RCA

July 2011: Recurrent angina, dyspnea

SPECT: Anterolateral ischemia, inferior and inferolateral ischemia. > 10% of ventricle ischemic. LVEF 33%

January 2013: DES to LAD beyond the LIMA.
CTO of RCA. Grafts occluded

Past History & Risk Factors: Obesity, HTN; Type 2 diabetes
AAA (3.7x4.2); Dyslipidemia, tobacco abuse

Medications Lisinopril 2.5mg qd; Plavix 75mg qd; Lasix 40mg qd;
Simvastatin 40 mg qd; Toprol XL 25mg qd; Metformin 500mg
bid; ASA 81mg qd.

Exam: 5'3", 233 lbs; BP 110/60.
Bilateral rales. Pulses reduced below femorals.

Target Lesion: CTO of RCA

Lossy Compression - not intended for diagnosis

**69-Year-
Old Male**

1-22-13



Lossy Compression - not intended for diagnosis

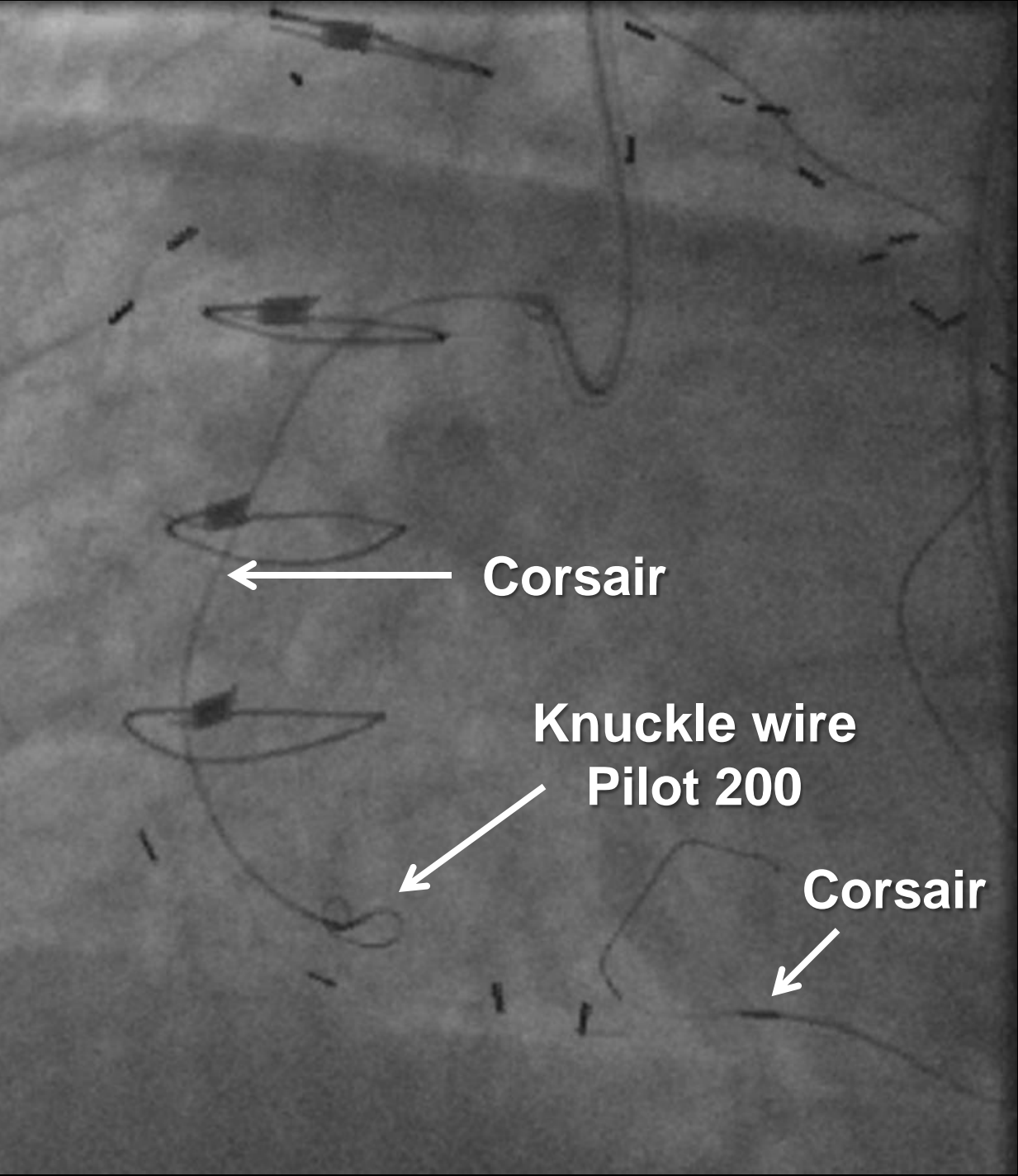
69-Year-Old Male

2-21-13



**69-Year-
Old Male**

2-21-13



← Corsair

Knuckle wire
Pilot 200

Corsair

Lesion Compression - not intended for diagnosis

**69-Year-
Old Male**

2-21-13

