Start and stop PCI for CTO

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Start CTO-PCI

How to get CTO technique

- Learn basic PCI experiences
- To add Complex PCI

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- B

Take a lot of years !

- Complex anteg

No shory cut way

Hard tip GW

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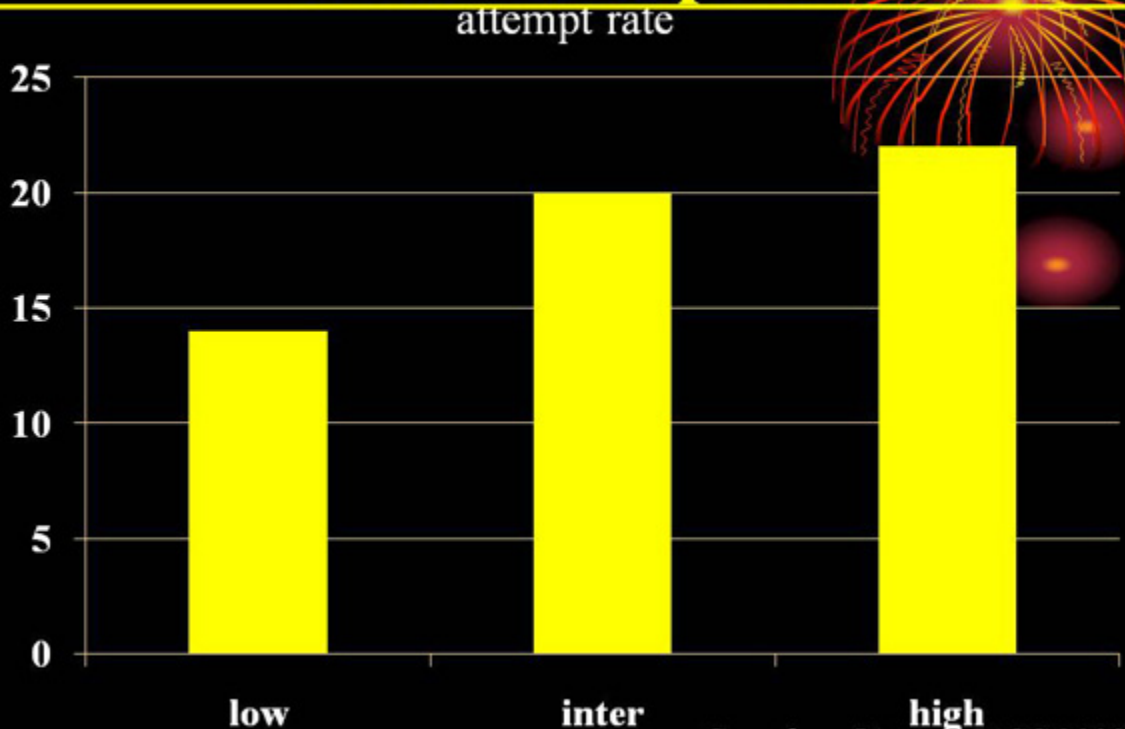
- Basic retrograde appraoch- septal channel
- Complex retrograde appraoch-epicardial channel

CTO attempt rate



Grantham JA et al: JACC 2009

Training of CTO-PCI operator

- *50 CTO-PCI / year*
- *Case selection*

  Tapered proximal CTO cap

  Length < 15mm

  Angulation < 45°
- *CTO-Day*

  experiened operators mentor less

  experienced operators during cases.

Grantham JA et al: JACC 2009

Training of CTO-PCI operator

- *Beginer: after 2year training, 30 CTO-PCI including 200 PCI / year*
- *Maintain skill : Minimum 50 CTO cases, no more than 2-3 operators with more than 1000 cases/year*
- *No allow*
  - *small volume center*
  - *no surgical backup*
  - *no deal with complication*

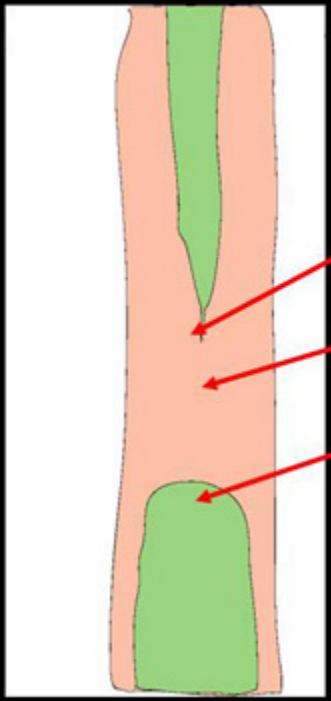
DiMario et al: Euro nterv 2007

Reason for failed CTO-PCI

- *MVD*
- *Bridging collaterals*
- *Branch at proximal stump*
- *A blunt stump*
- *Long lesion*
- *Calcification*
- *Tourtousity (<45°)*
- *Ostial lesion*

Intinal selection of CTO is not like this

“Easy” CTO



1) Straight vessel

2) Stump without side branch

3) Short lesion

4) Convex type

Basic Technique for CTO

1. Reading of Angiogram
2. Good back up Guide Catheter
3. Contralateral Injection
4. Use of microcatheter
5. Choice of CTO guidewire

Reading of Angiogram of CTO

What do you see ? How to read ?

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To take a appropriate picture

No Panning, avoid double vessel, correct angle, size choice

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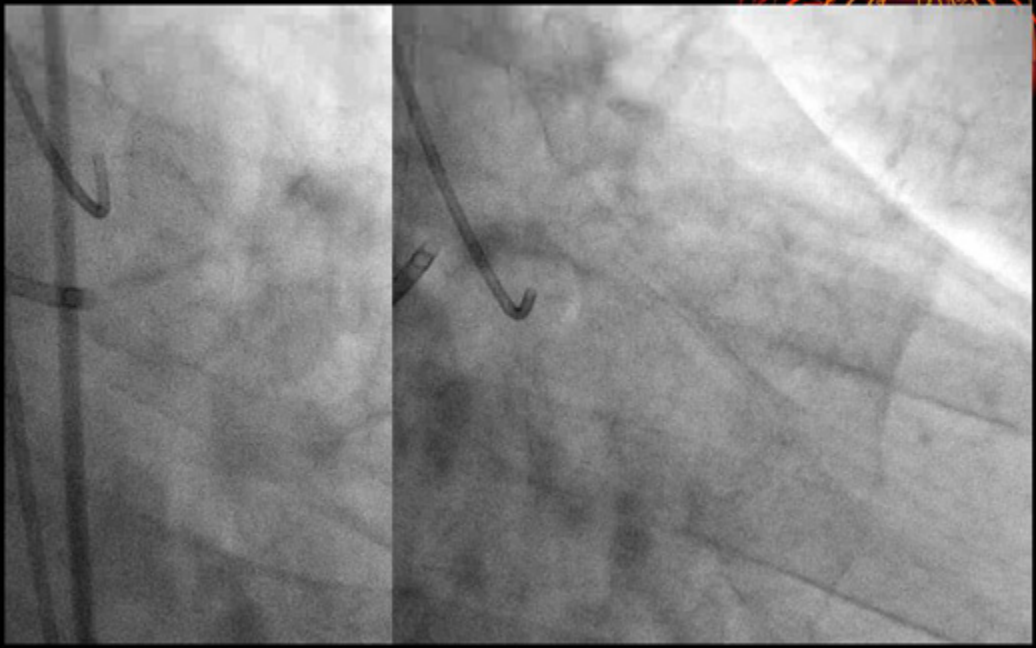
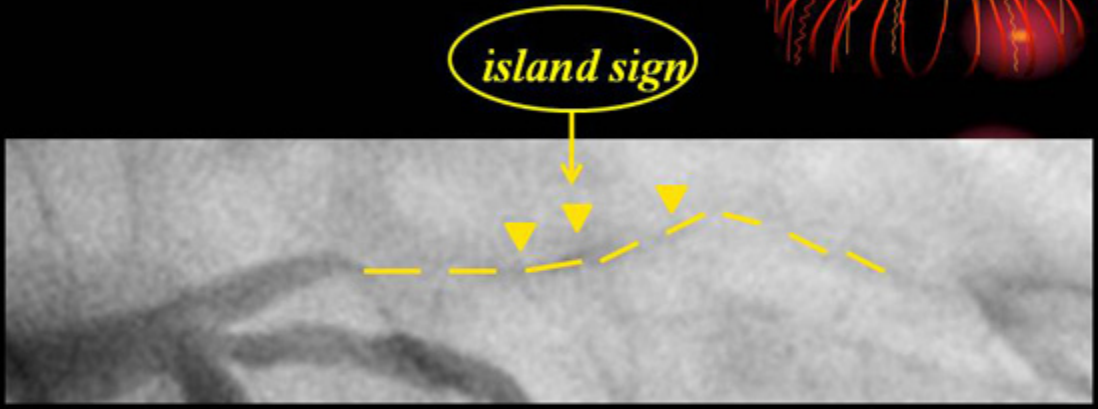
- **Entry , re-entry structure**
- **Length of CTO**
- **Angle of CTO vessel**
- **Vessel size CTO vessel**
- **Reconstruction Imagine CTO vessel**
- **Detail of Collateral pathway**

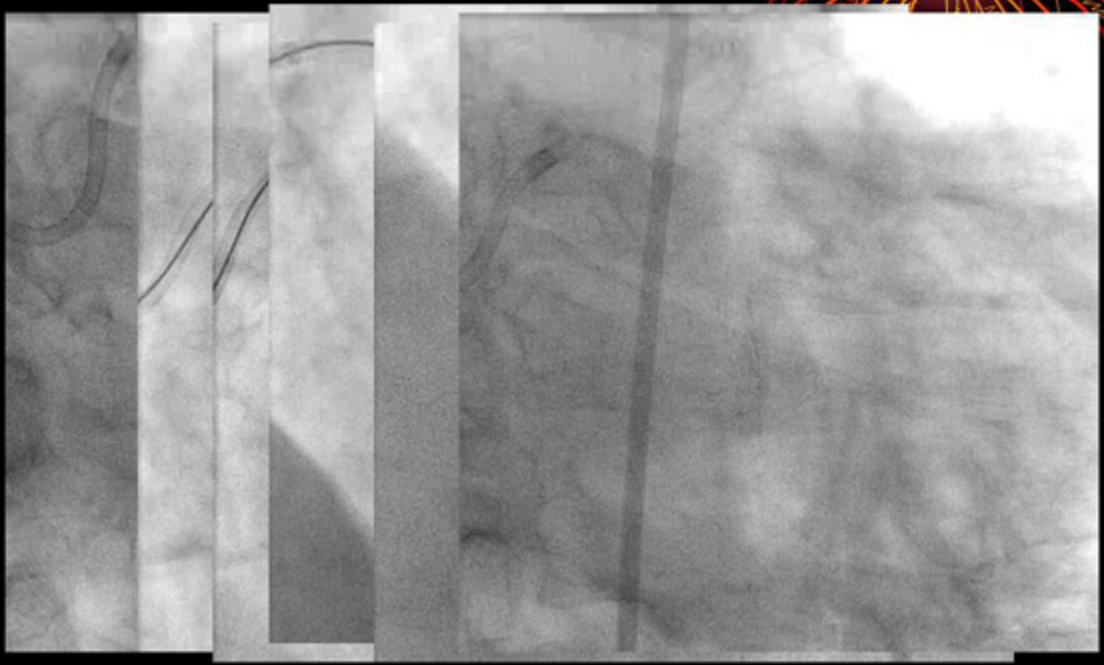
Island sign in CTO



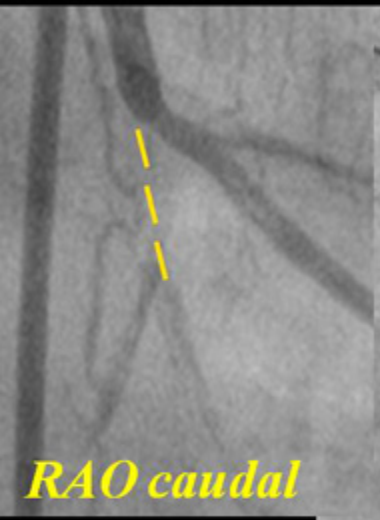
Island sign in CTO



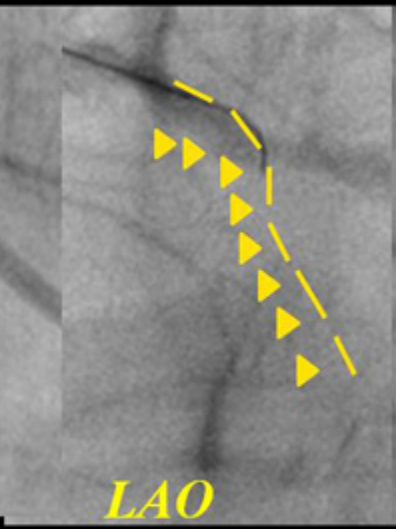
Acute angle in CTO



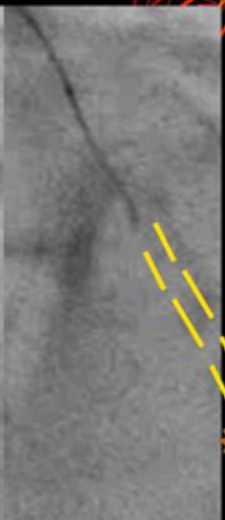
Acute angle in CTO on LAO view

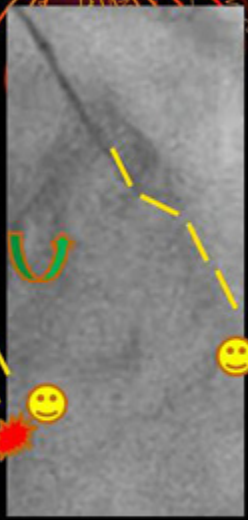


RAO caudal



LAO





LAO

Theory of changing view angle

At first, GW looks like into true channel. But don't push it.

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Rotation image 90 degree, it can see 3-D construction comparing vessel way and GW way.

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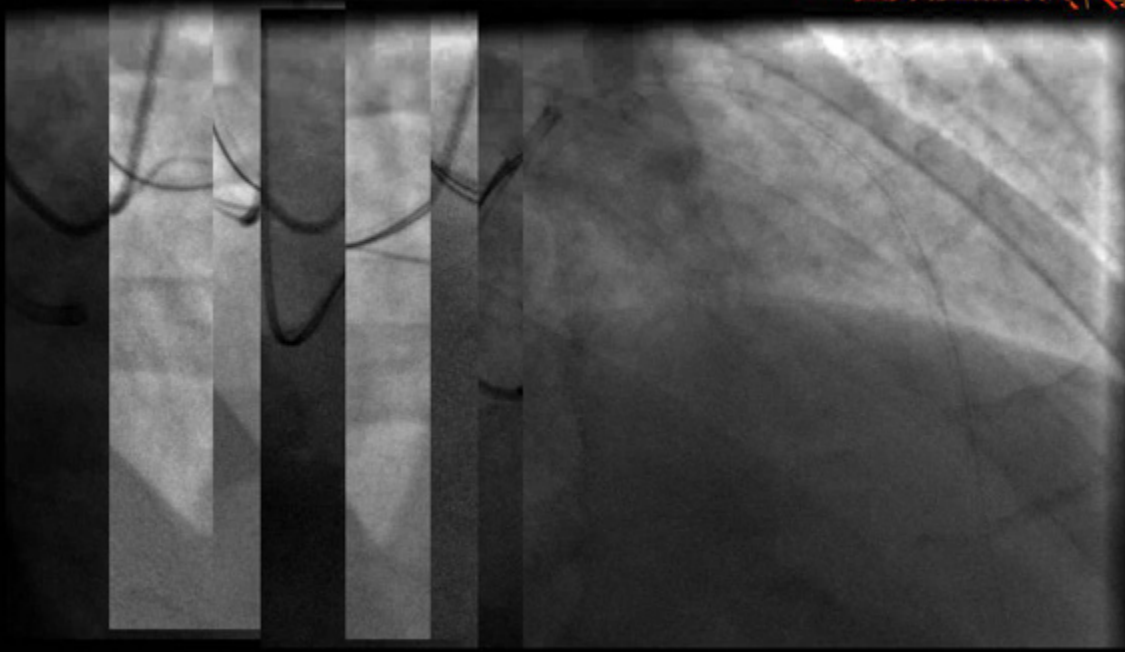
Contralateral injection with microcatheter



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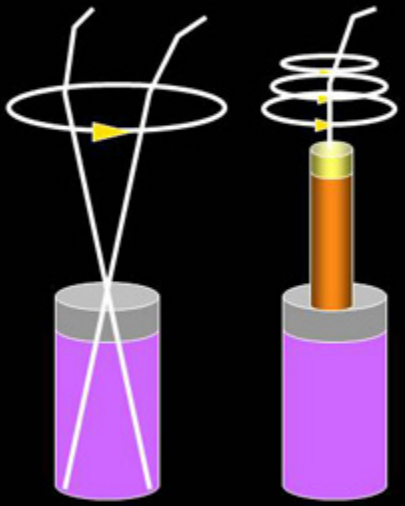
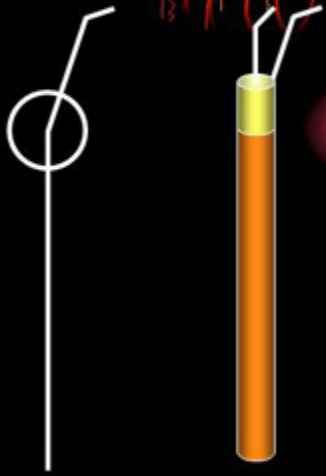
Control guidewire movement



Support to wire manipulation



Cancel a secondary curve

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Importance of Tapering Guidewire

Most of CTO lesion has some microchannel

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1st choice of CTO GW are tapering GW

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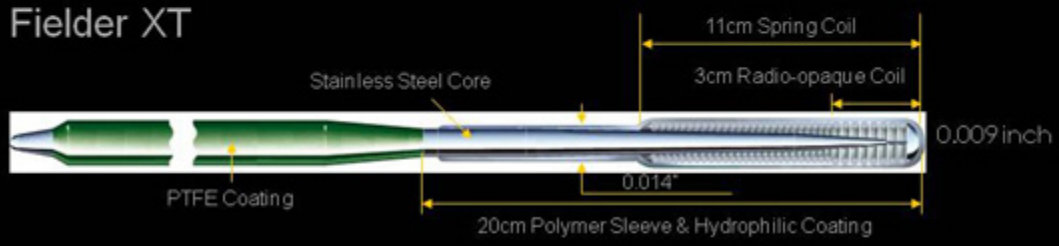
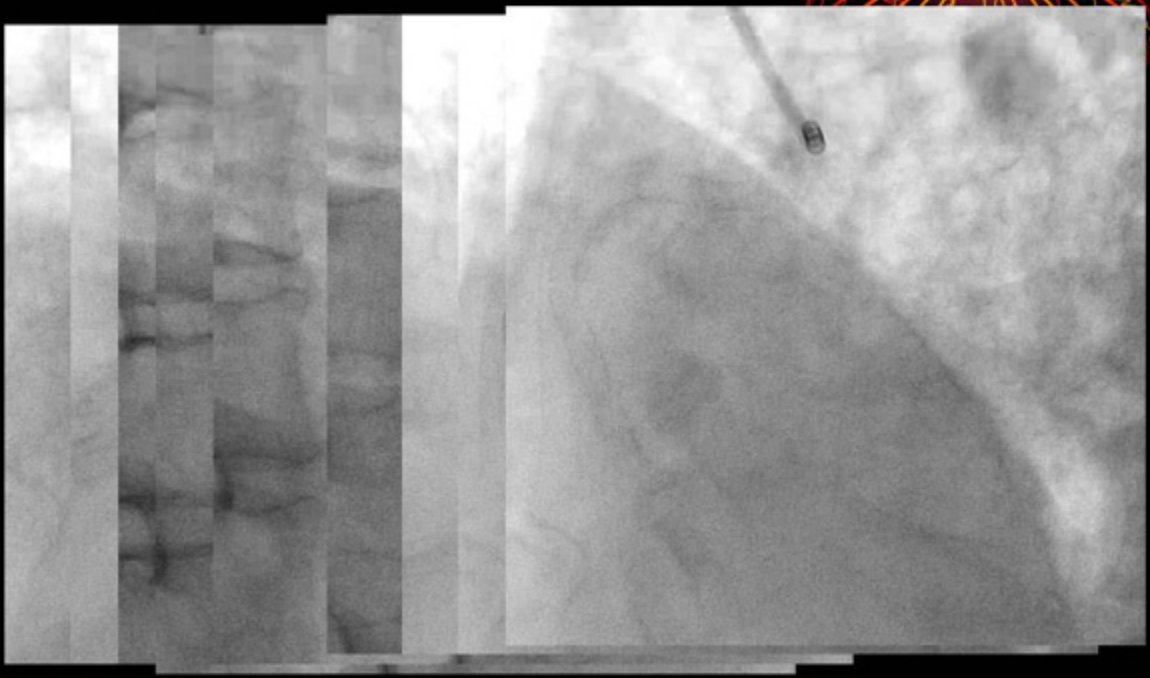
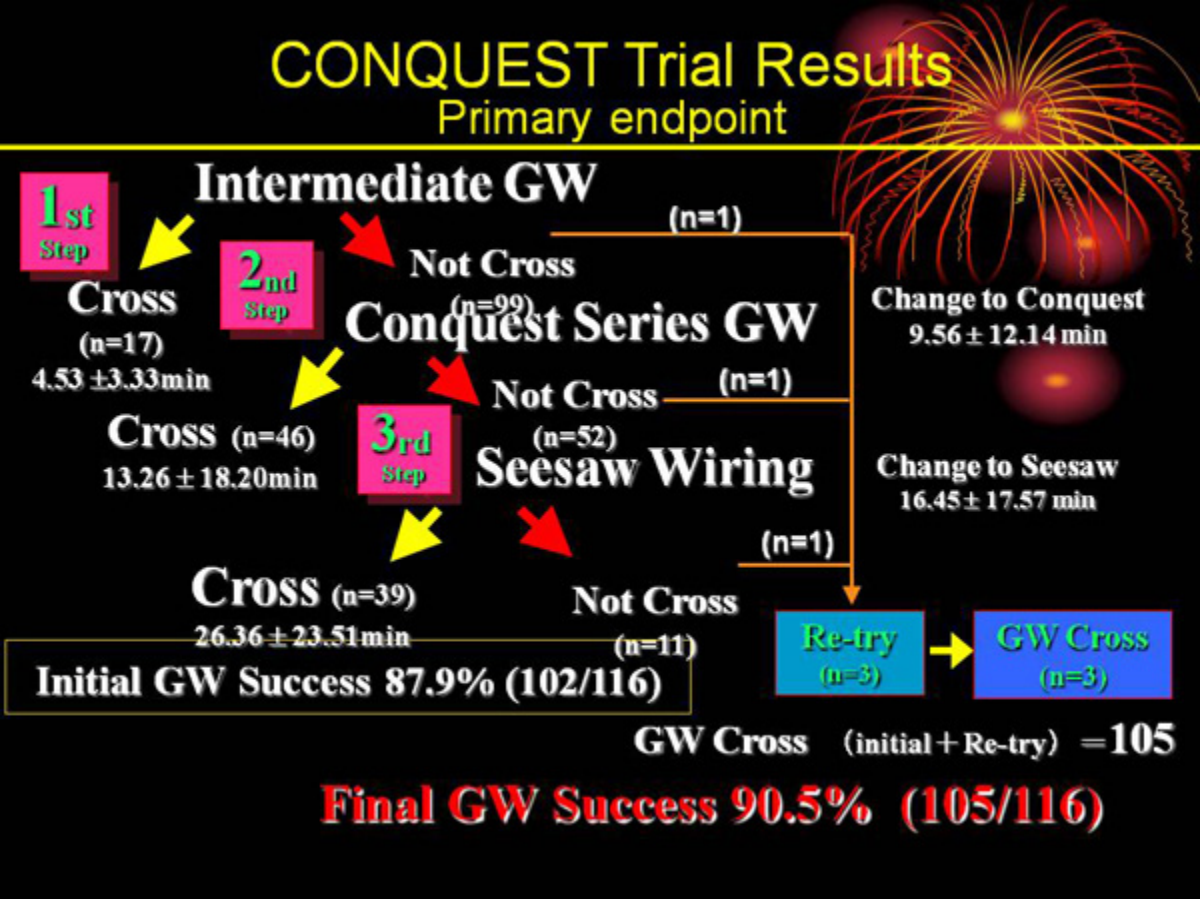


Angled CTO usind Miracle GW



CONQUEST Trial Results

Primary endpoint



Stop CTO-PCI

Minimized contrast side effect

- *Maximun contrast doze (MRCD)*

  MRCD=5m l x BW x Cr

- *Infusion*
- *Types of dye*

  isoosmotic dye(Visipaque)

- *Technical points*

  suitable angle of cine

  Biplane cine

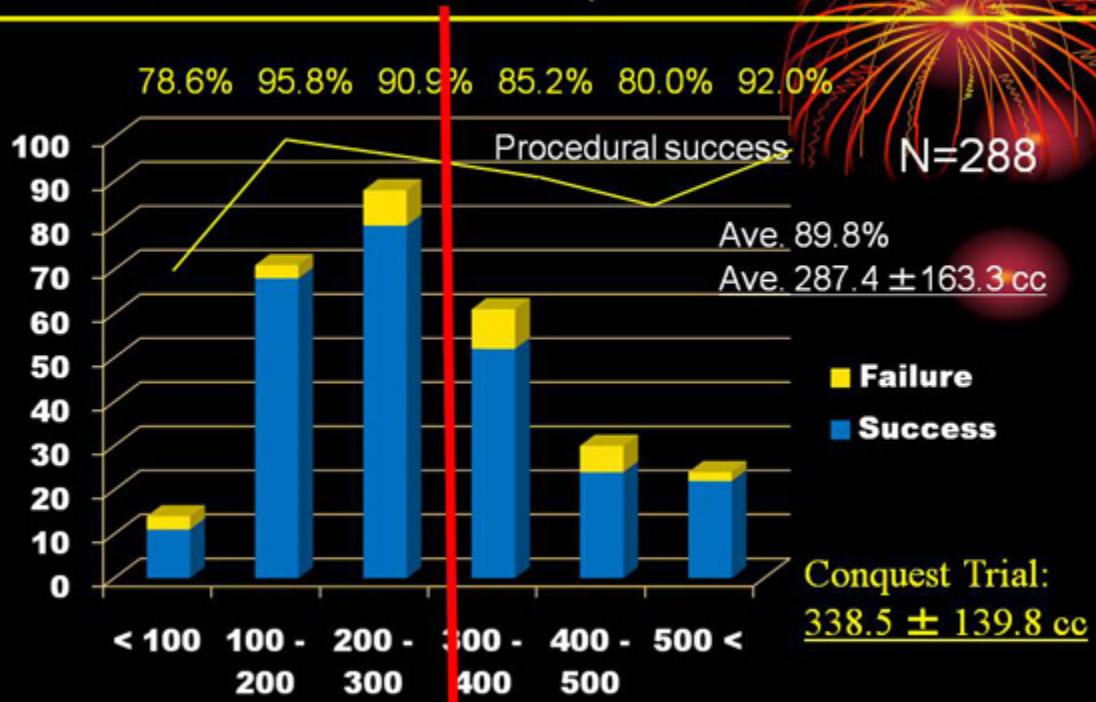
  Microcatheter injection

  IVUS guide

Prevention for radiation exposure

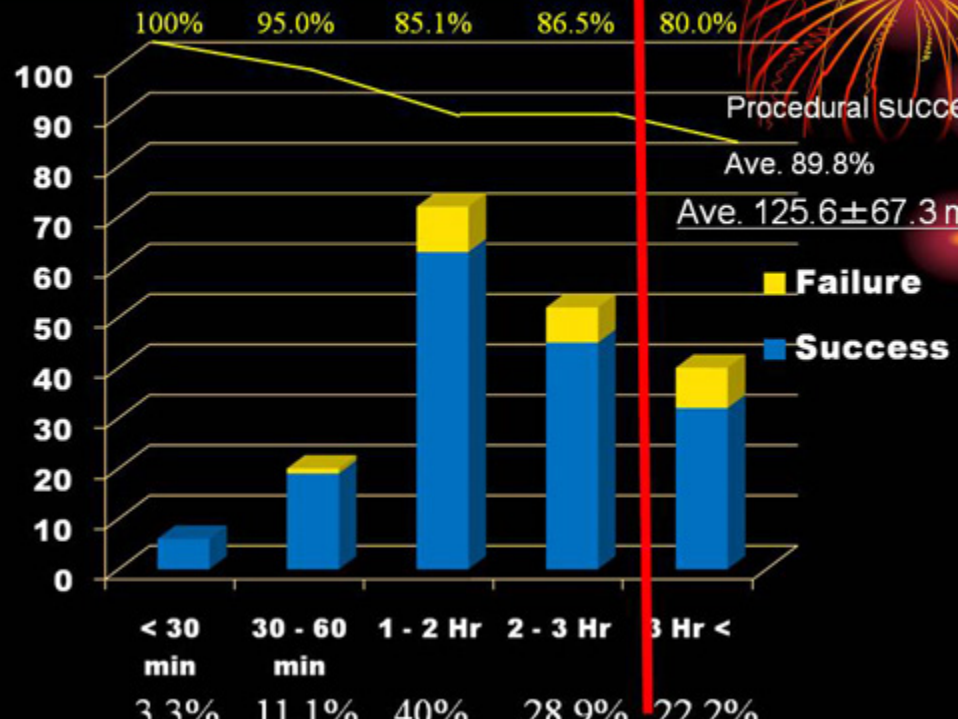
- *Proper use of filter*
- *Minimized fluo and cine angiogram*
- *Close I.I*
- *Separate X-ray tube*
- *Avoid zoom-up view*
- *Changing angle*
- *Avoid lateral and high angle view*
- *Avoid biplane cine*

Total Contrast Volume (CTO treatment only)



Morino et al: Jacc Interv 2010

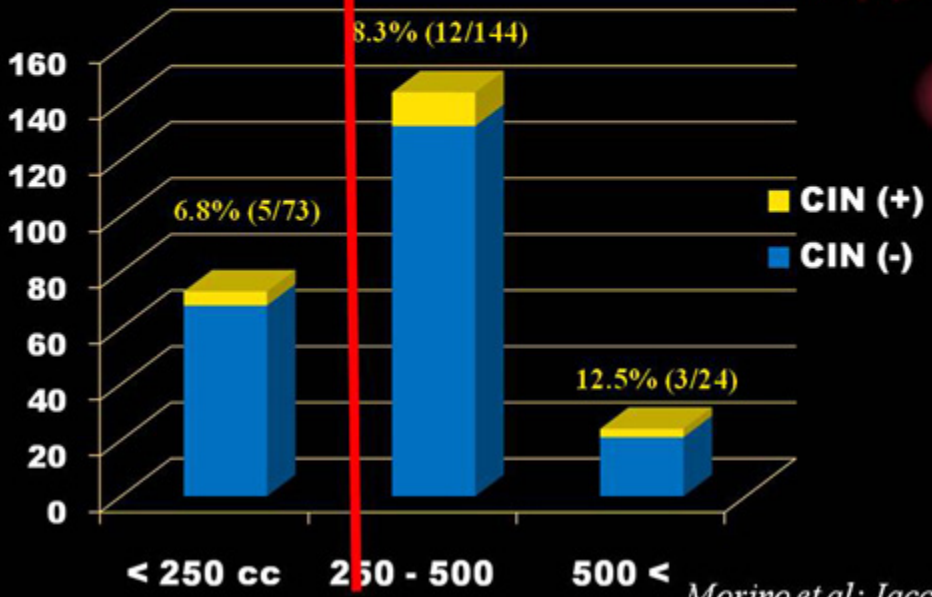
Total Procedural Time



Morino et al: Jacc Intery 2010

Contrast Induced Nephropathy (CIN)

Defined as Cr ≥ 0.5 mg/dl or ≥ 25% increase within 48 hours



Morino et al: Jacc Interv 2010

Conscious 3-3-3

- *Procedure time—3 Hr(if possible 2Hr)*
- *contrast—300ml*
- *Radiation doze— 3 Gr*

Another timing of stop procedure

- *No advance of guidewire manipulation more than 30min.*
- *Antegrade guidewire in the false lumen*

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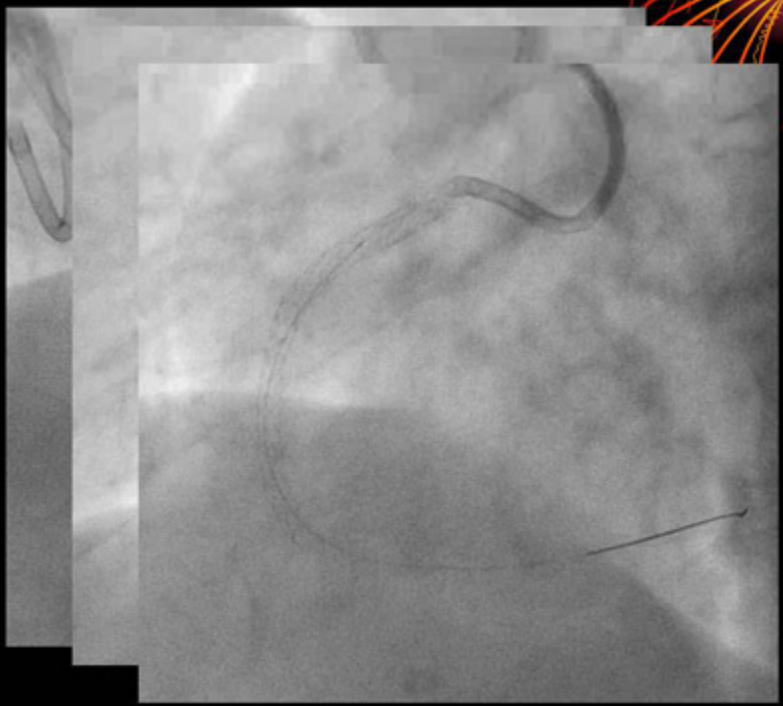
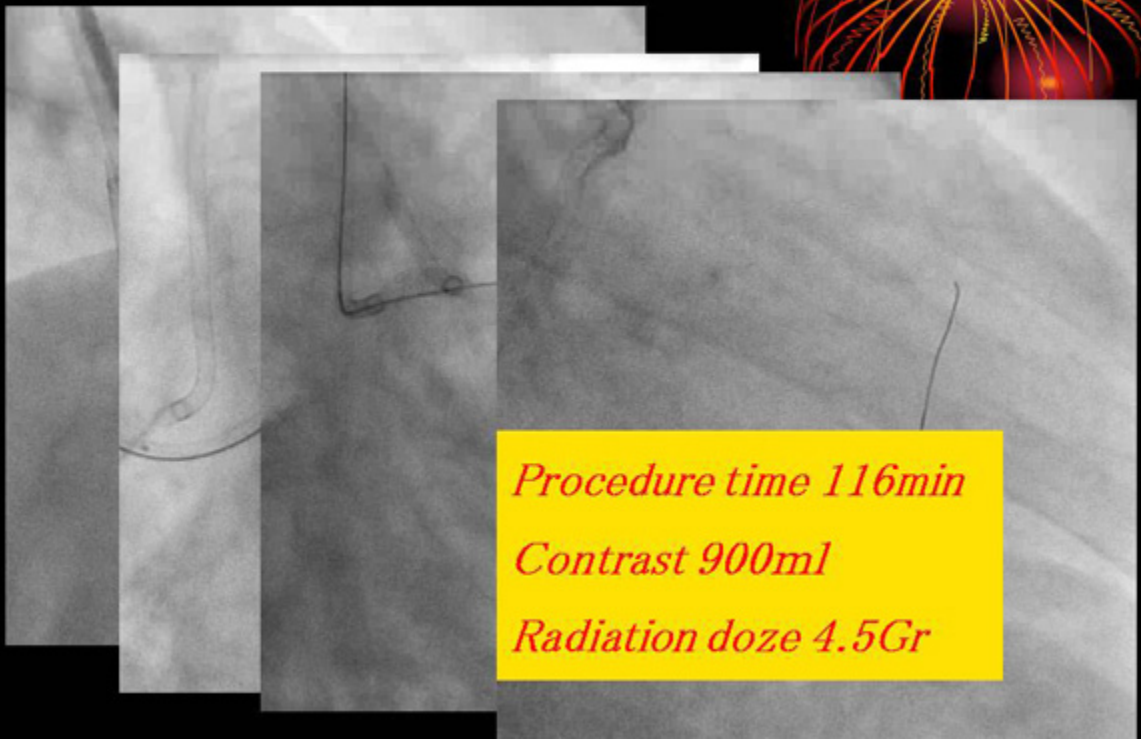
Change to Retrograde approach

Less than 30min antegrade manipulation

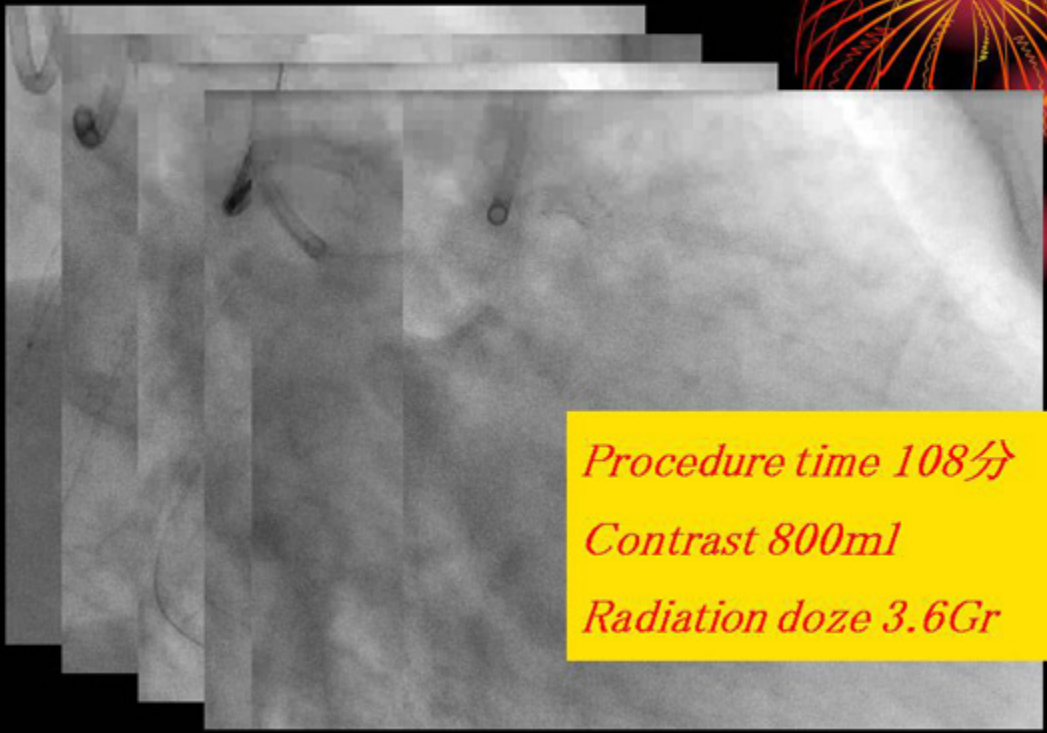
Staged PCI for failed 1st approach



Staged PCI for failed 1st approach



Staged PCI for LAD CTO



Procedure time 108分

Contrast 800ml

Radiation doze 3.6Gr

Take home message

- Beginer should start 'easy CTO case'
- Train with expert or at high volume CTO center
- Learn basic CTO strategy and devices
- Keep mind 'triple tree'
- Judge stop timing of procedure
- Concern about next strategy

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Benfit of patients > Pride of operator