

Contemporary Approach in Left Main PCI: Three Dimensional (3D) - OCT Guided Provisional Strategy

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Disclosure

I do not have any potential conflict of interest to declare

Left Main Bifurcation PCI

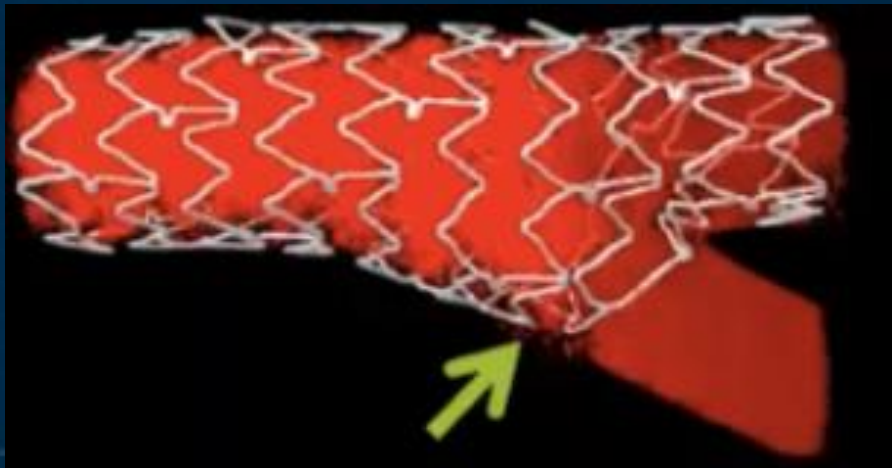


- EBC MAIN trial recommends a **stepwise layered provisional approach** for treating true distal LM bifurcation stenosis with less complex features

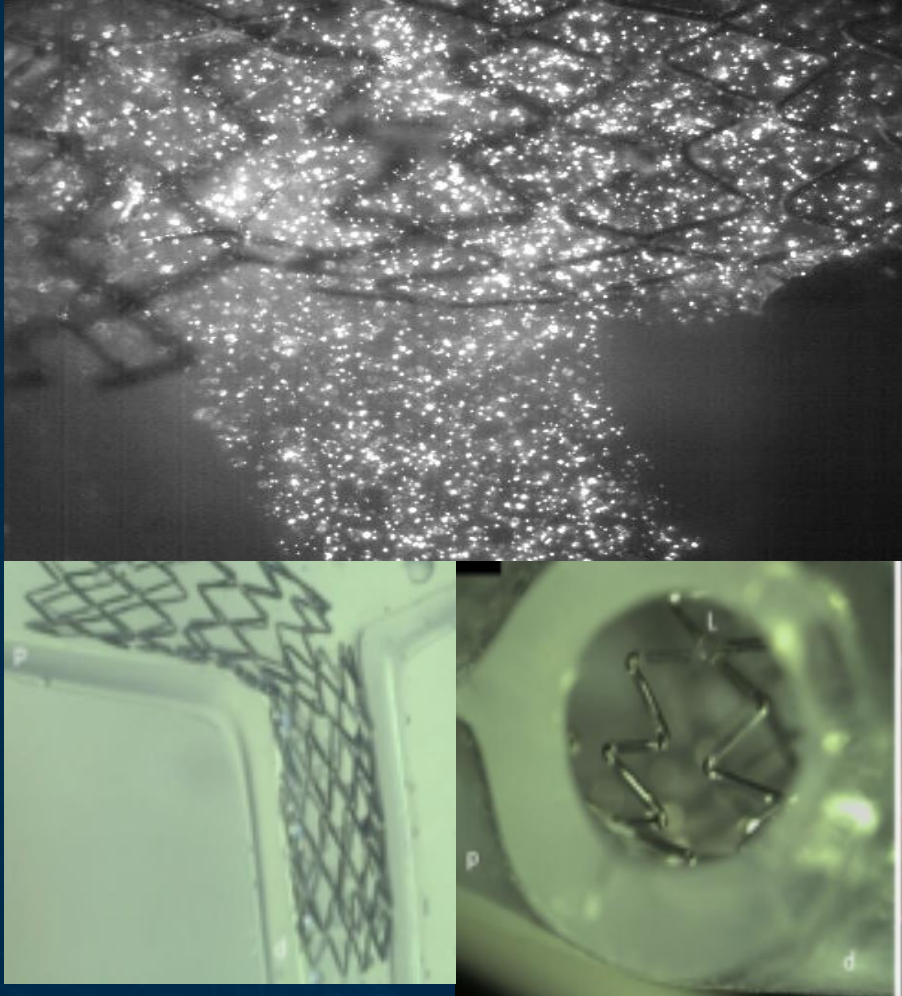
Left Main Bifurcation PCI



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- No uniform recommendations for an optimal provisional strategy for LM bifurcation lesions exist

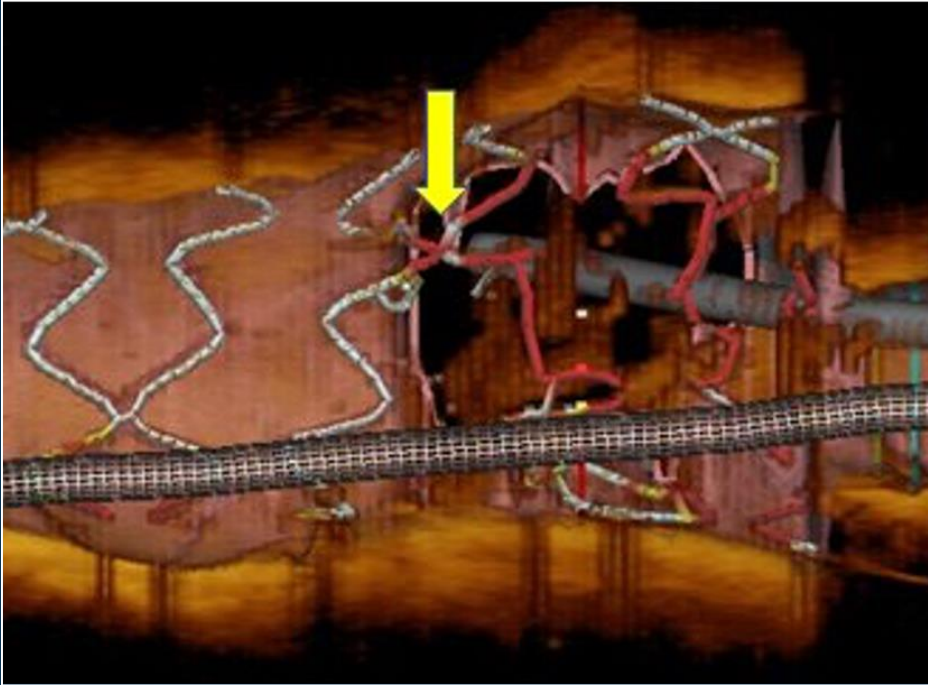


Left Main Bifurcation PCI

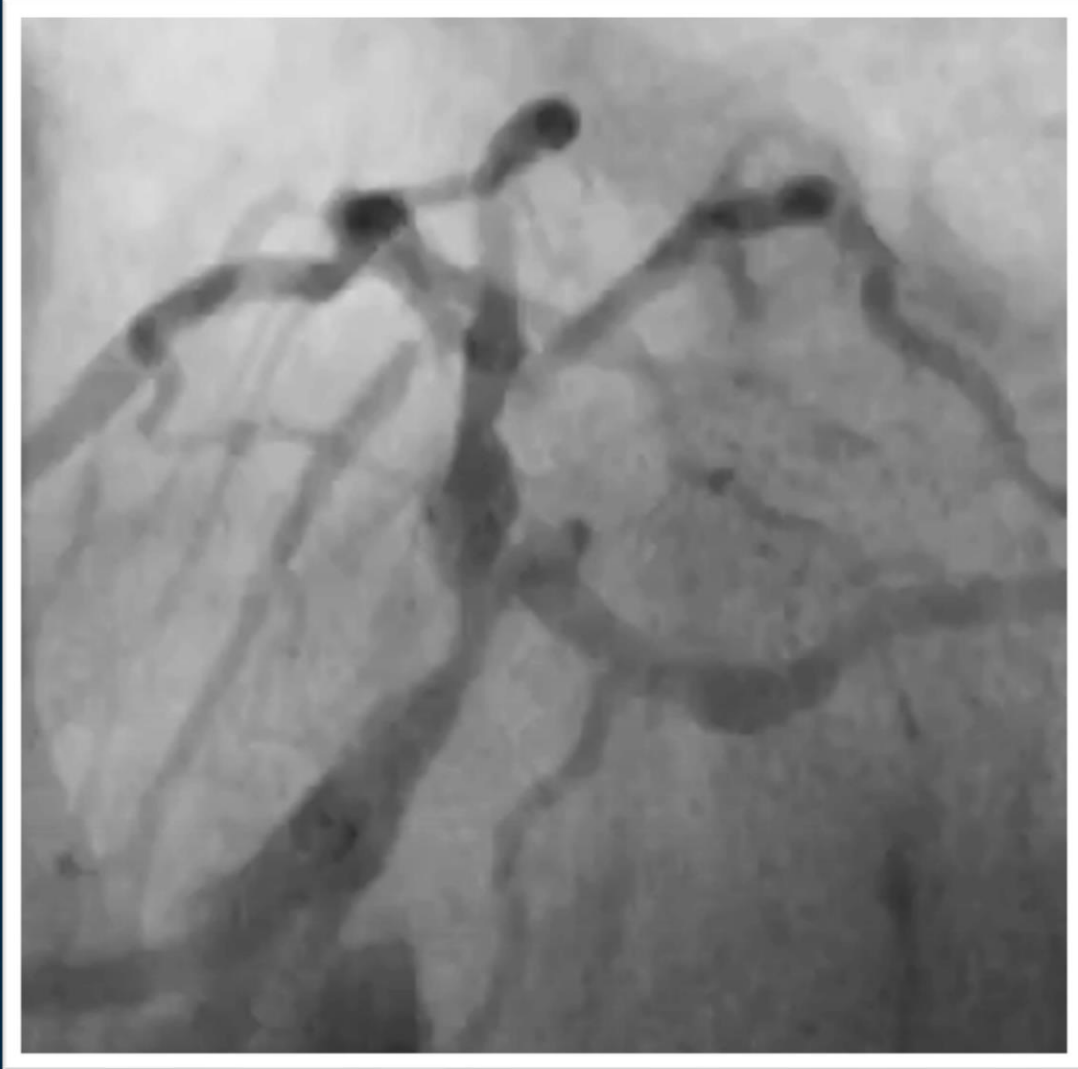


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- No uniform recommendations for an optimal provisional strategy for LM bifurcation lesions exist
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Left Main Bifurcation PCI



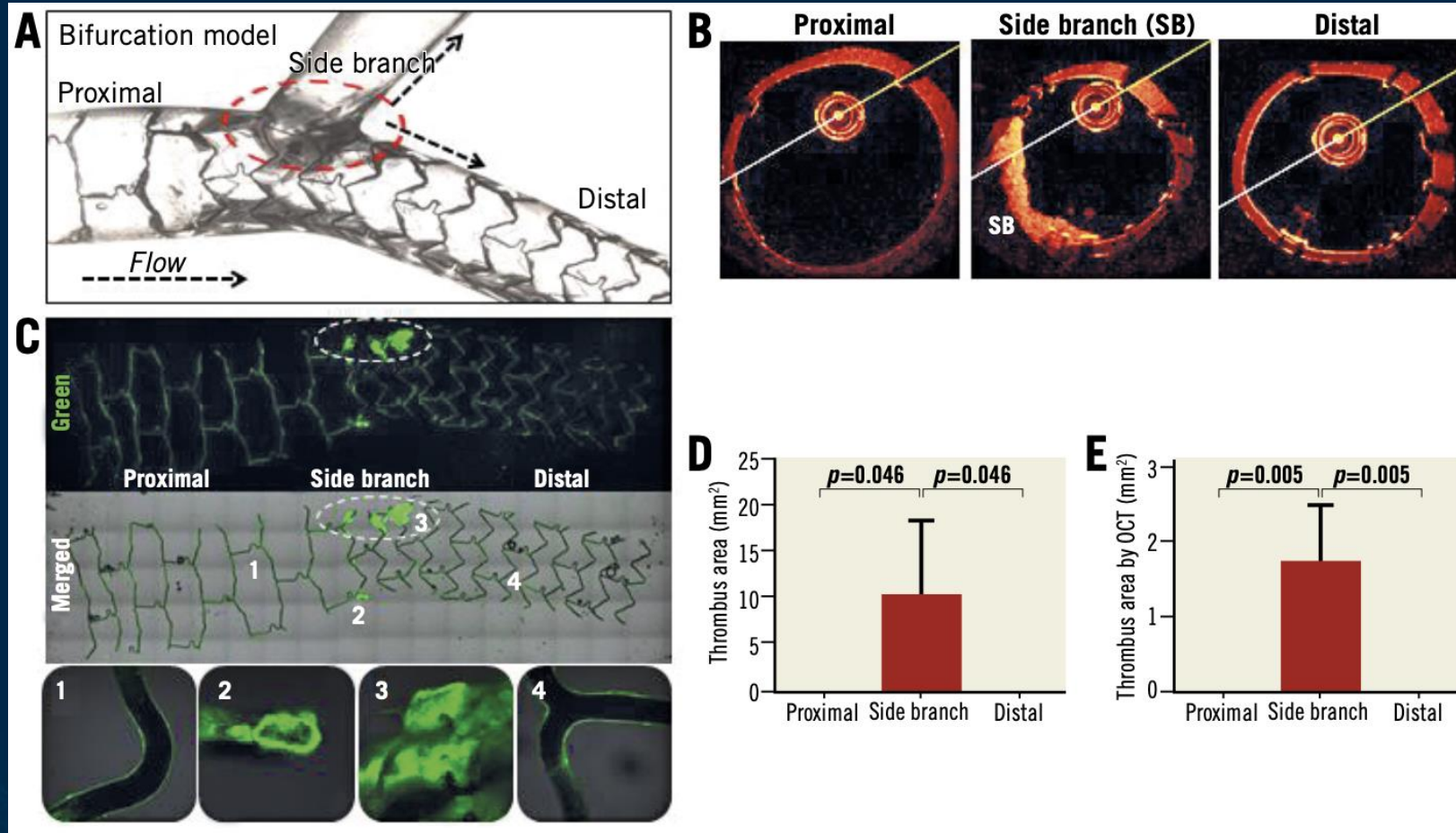
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- No uniform recommendations for an optimal provisional strategy for LM bifurcation lesions exist.
- Bifurcation PCI should resemble the **original anatomical structure** and **minimize metallic jailed strut** in the ostial side branch (SB) to reconstruct natural shape, restore rheology, preserve flow & function
- **3D-OCT** facilitates clear visualization of stent configuration and GW position, which may **optimize LM bifurcation PCI**



Left Main Bifurcation Different

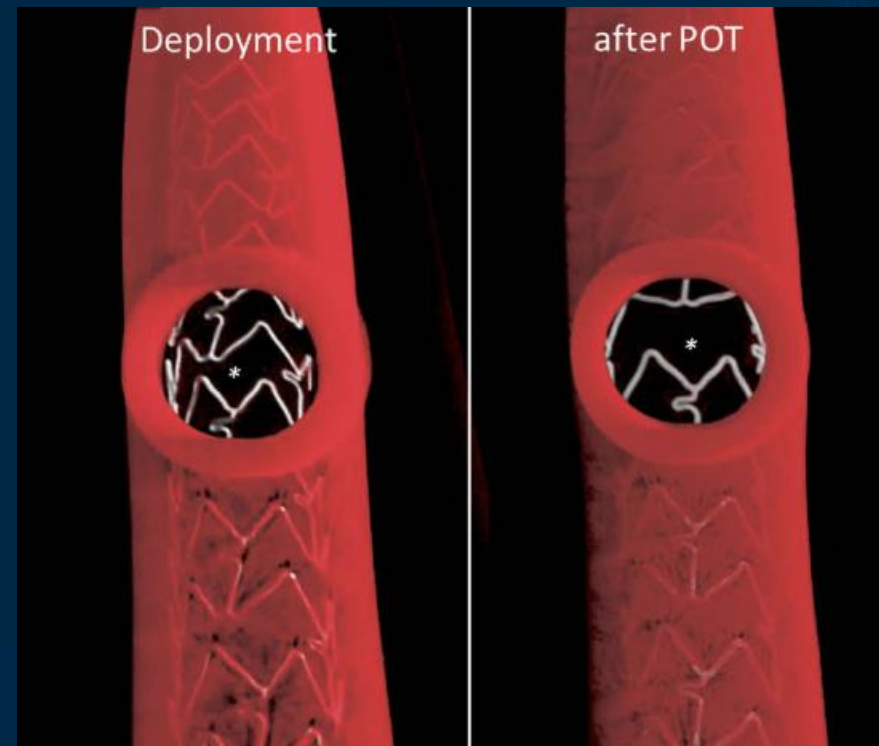
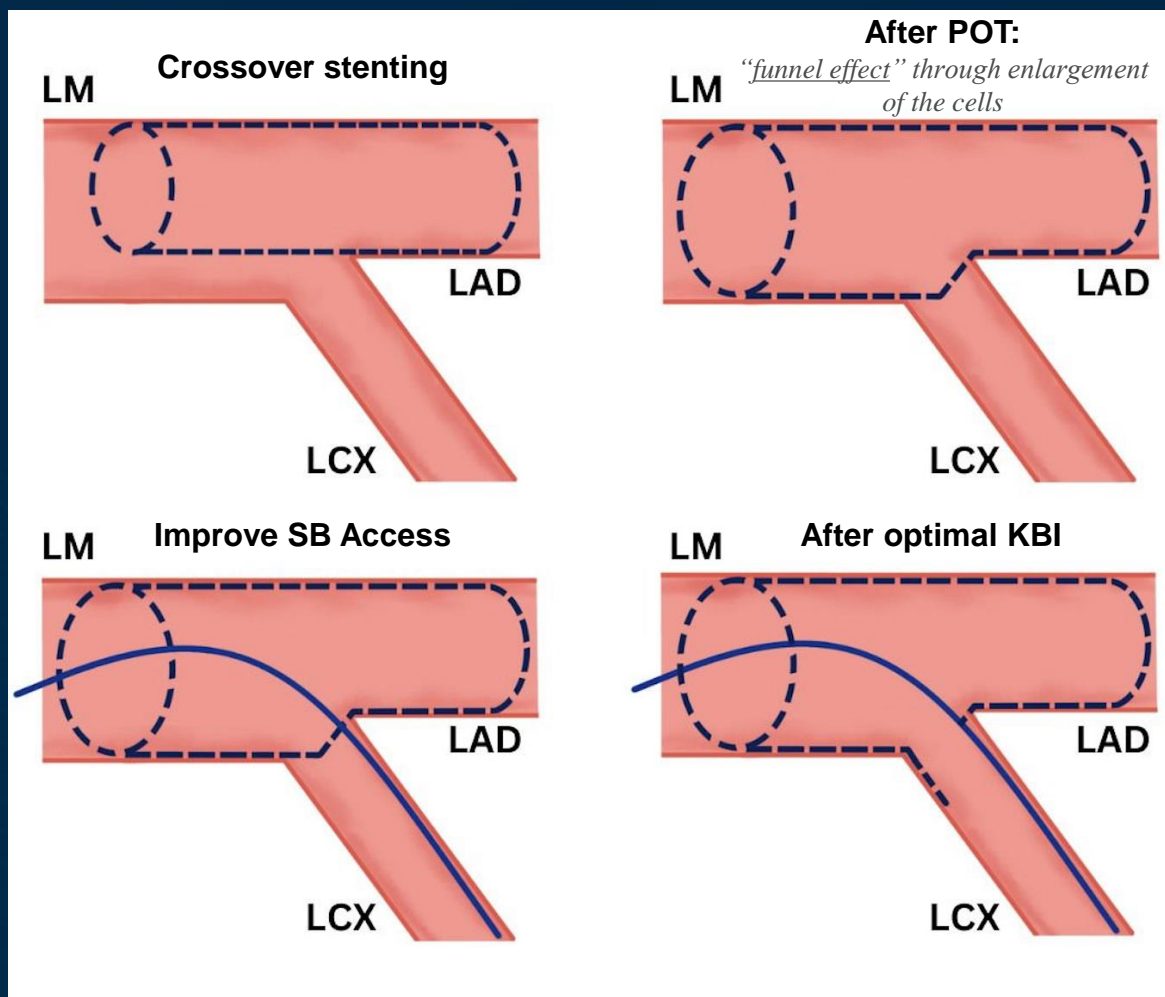
- T – shape angulation
- Large MV: caliber discrepancy
- Calcification
- Ostium involved
- **Significance Side Branch : LCx**
(up to more than 40 %
myocardium)

Thrombogenicity at the jailed side branch ostia in the provisional stenting technique: insights from an in vitro model



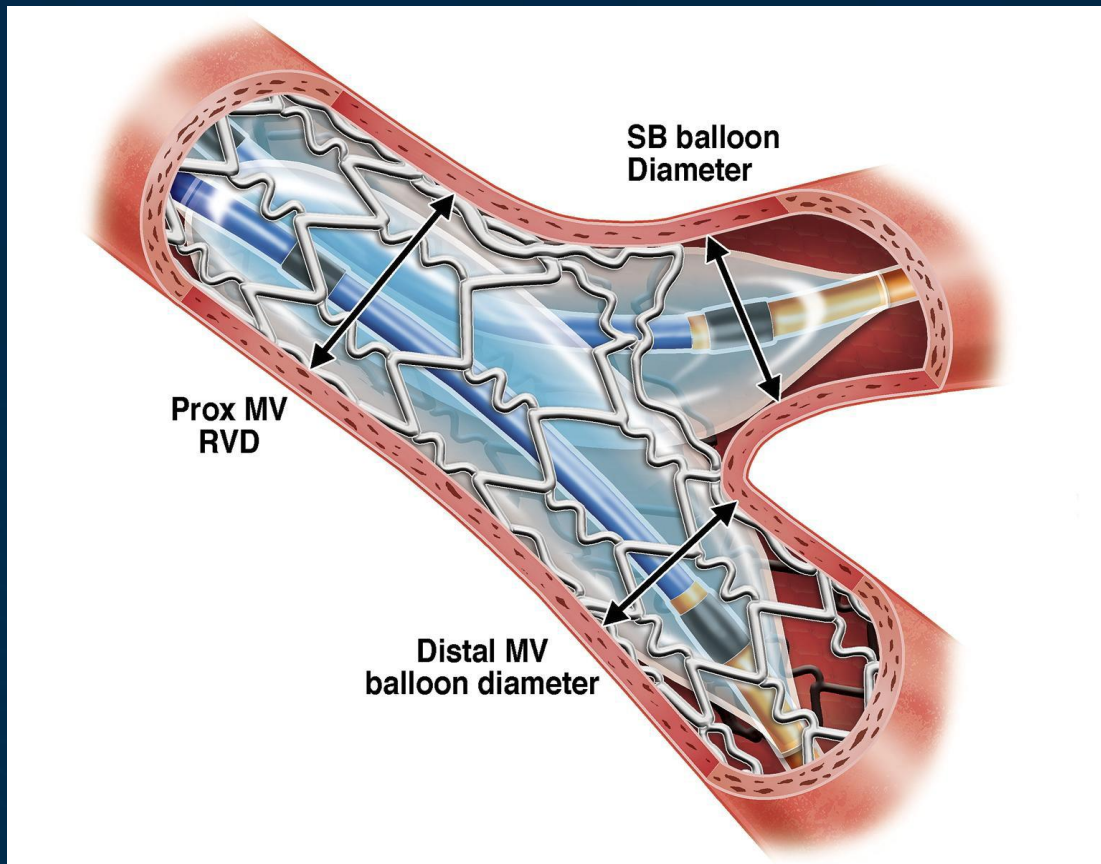
Optimizing Provisional LM PCI

15th EBC Consensus recommends routine proximal optimization technique (POT)



Impact of the POT technique on SB access and jailed strut

Optimizing Provisional LM PCI



Kissing balloon inflation:

- Strategy to **remove jailed strut**, optimize SB, and form bifurcation fractal geometry
- Inconsistencies in studies results regarding KBI in provisional stenting

Optimizing Provisional LM PCI

Controversies in Kissing Balloon Inflation

Pros

- Decrease side branch stenosis
- Reduced incomplete stent apposition
- Reduced TLR

(Gaido 2020; Ahn, 2017)

Similar with nonKBI

- Greater luminal gain in the proximal MV and SB with a similar MACE vs no KBI
- No clear benefit between KBI vs no KBI after crossover stenting

(Kim, 2020; Murasato, 2016)

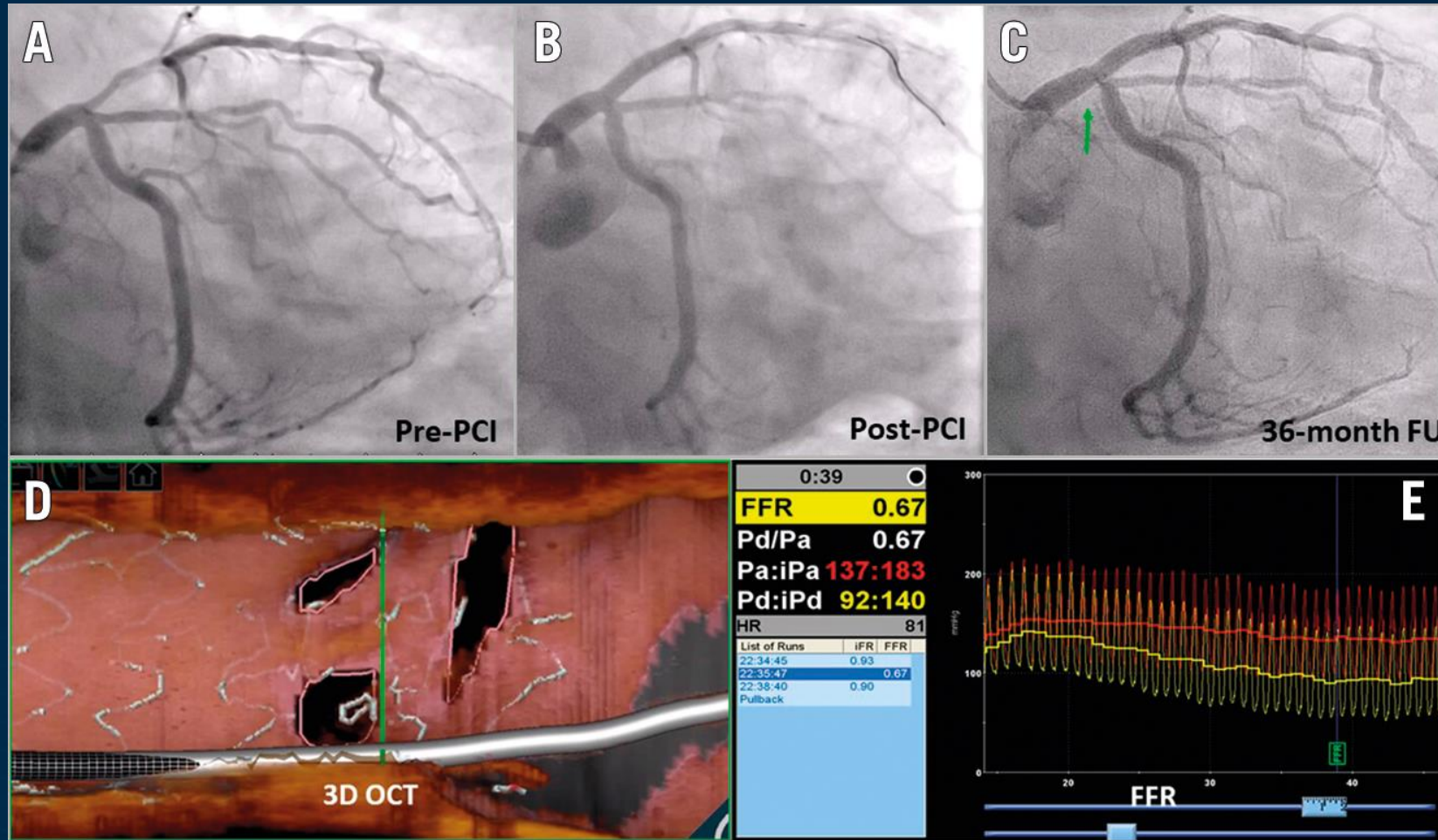
Cons

- Increase the risk of proximal stent deformation
- Increase the risk of main branch restenosis

(Sgueglia 2012; Zhong, 2018)

Recognition of Novel Imperfection

The 15th Consensus Document from the European Bifurcation Club (2021)

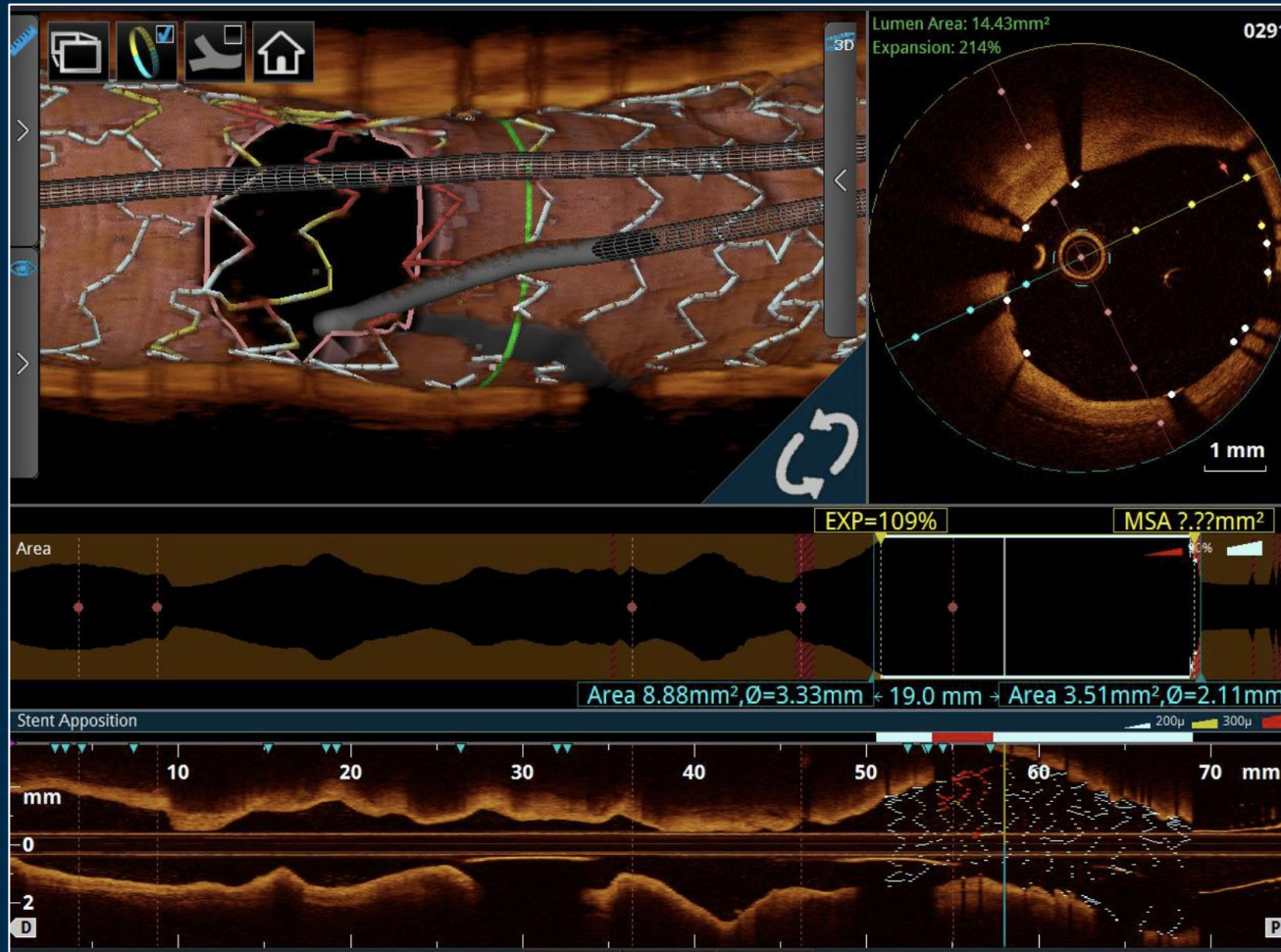


"Fenestrated" restenosis
at LCx ostium
3year after crossover stenting

↑
Jailed strut
↓

Position of "link" struts
across SB ostia
associated with
incomplete stent
apposition after kissing

3D – OCT Information



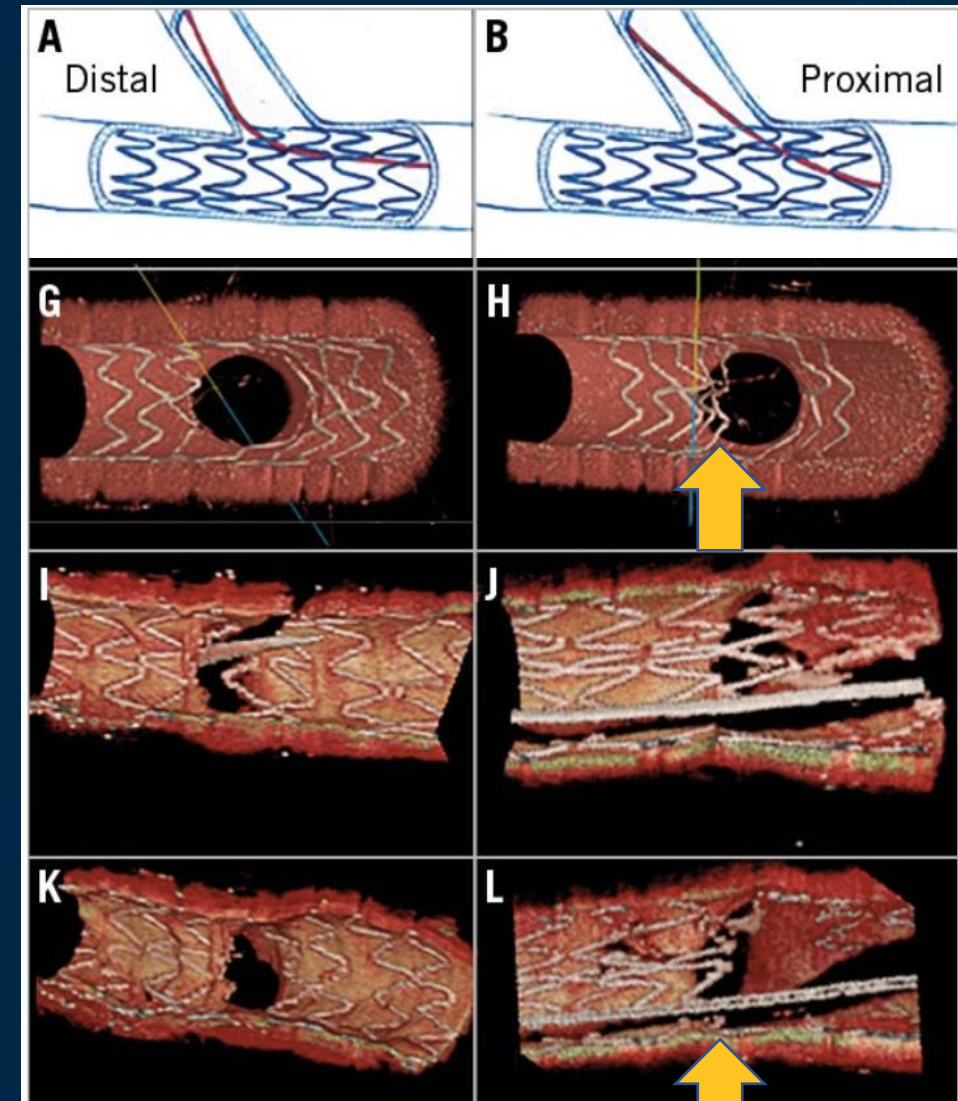
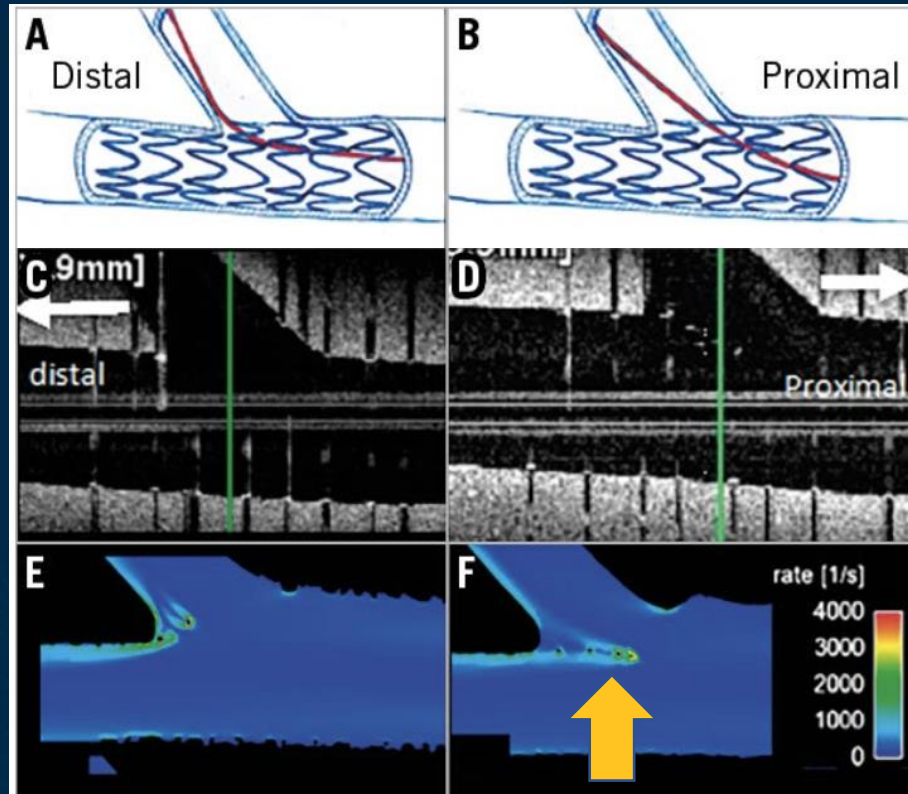
- Stent apposition
- Stent cell figure
- **Jailed strut**
- **Link configuration carina**
- **GW recrossing position**

Limitations:

- Requirement of specified guide extension catheter to visualized aorto-ostial site
- Need complete blood removal for clear 3D bifurcation reconstruction

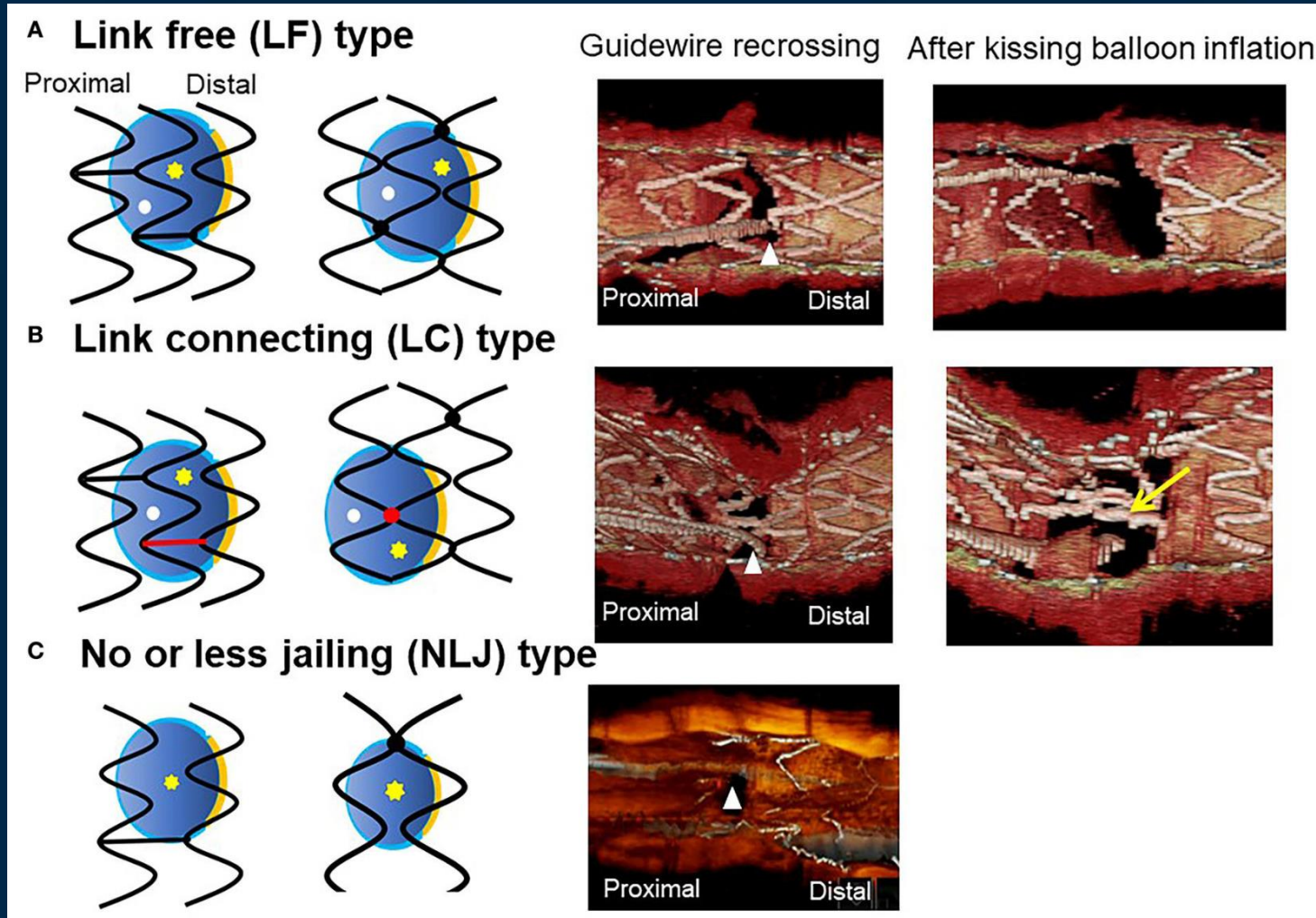
KBI: Impact of GW Recrossing Position

The Joint Consensus : the European and Japanese bifurcation clubs


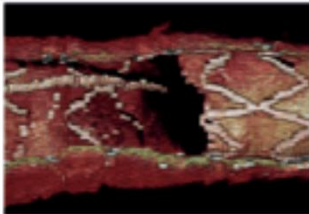
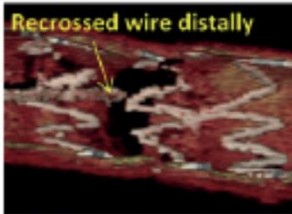
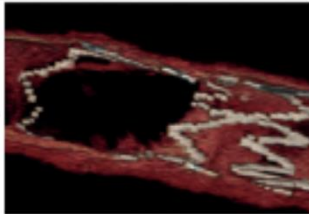
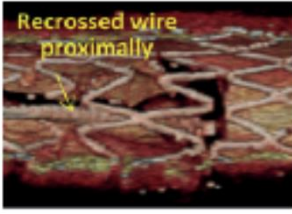
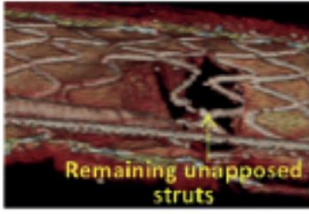
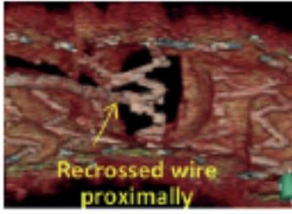

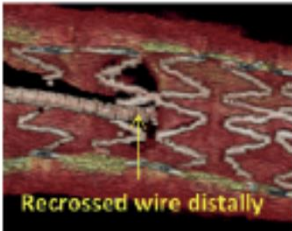

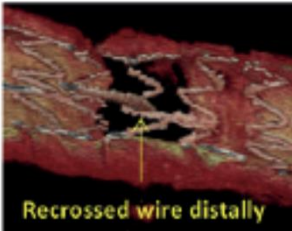
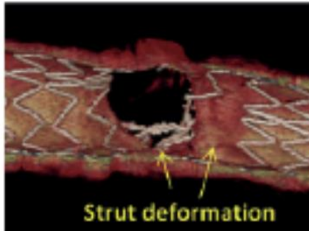
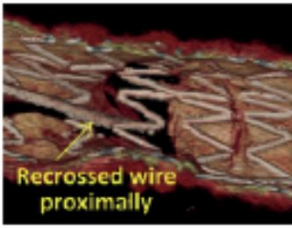
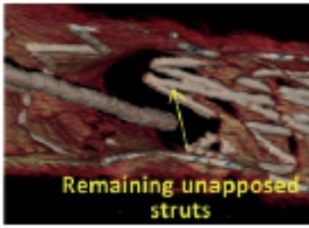
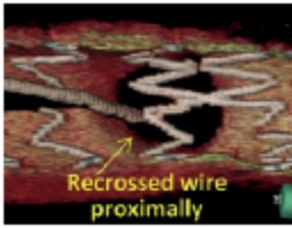
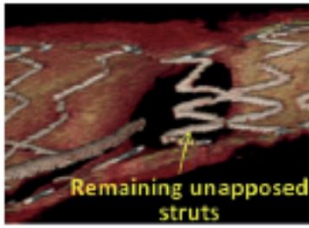


Contemporary Concept of 3D OCT-guided SB treatment

Classification of jailing strut configuration



Jailing configuration, recrossing position and 3D bifurcation type

Jailing configuration	Recross position	Parallel type		Perpendicular type		Group
		Guidewire recrossing	After kissing ballooning	Guidewire recrossing	After kissing ballooning	
"Link-free type" No link at carina	Distal					LFD
	Proximal					
"Link-connecting type" Presence of link at carina	Distal					Non-LFD
	Proximal					

3D OCT guided KBI

- **Aggressive POT may change jailing strut configuration**

3D OCT guided KBI

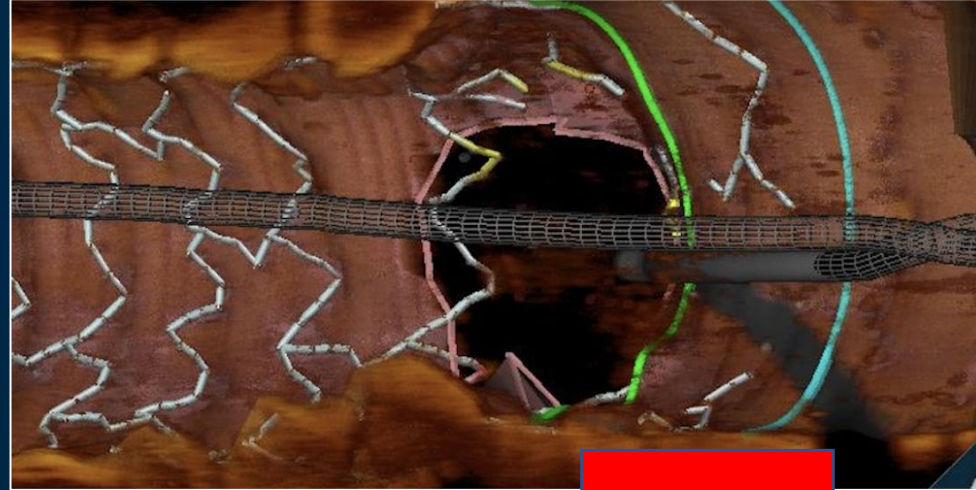
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Optimal POT at nominal pressure: minimal jailed strut (NLJ type)

3D OCT guided KBI

- Aggressive POT may change jailing strut configuration



Optimal POT at nominal pressure: minimal jailed strut (NLJ type)



Agressive POT: NO KBI NEEDED

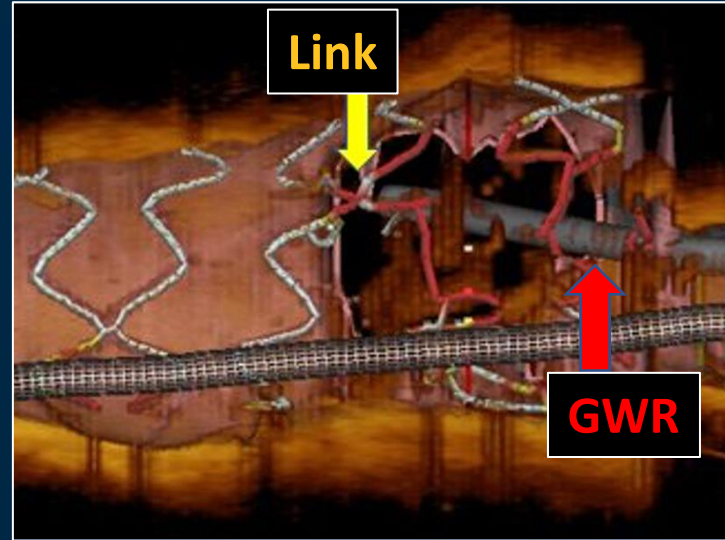


3D OCT guided KBI

- Aggressive POT may change jailing strut configuration
- **Distal cell is not always optimal cell**
 - Depend on link - carina configuration

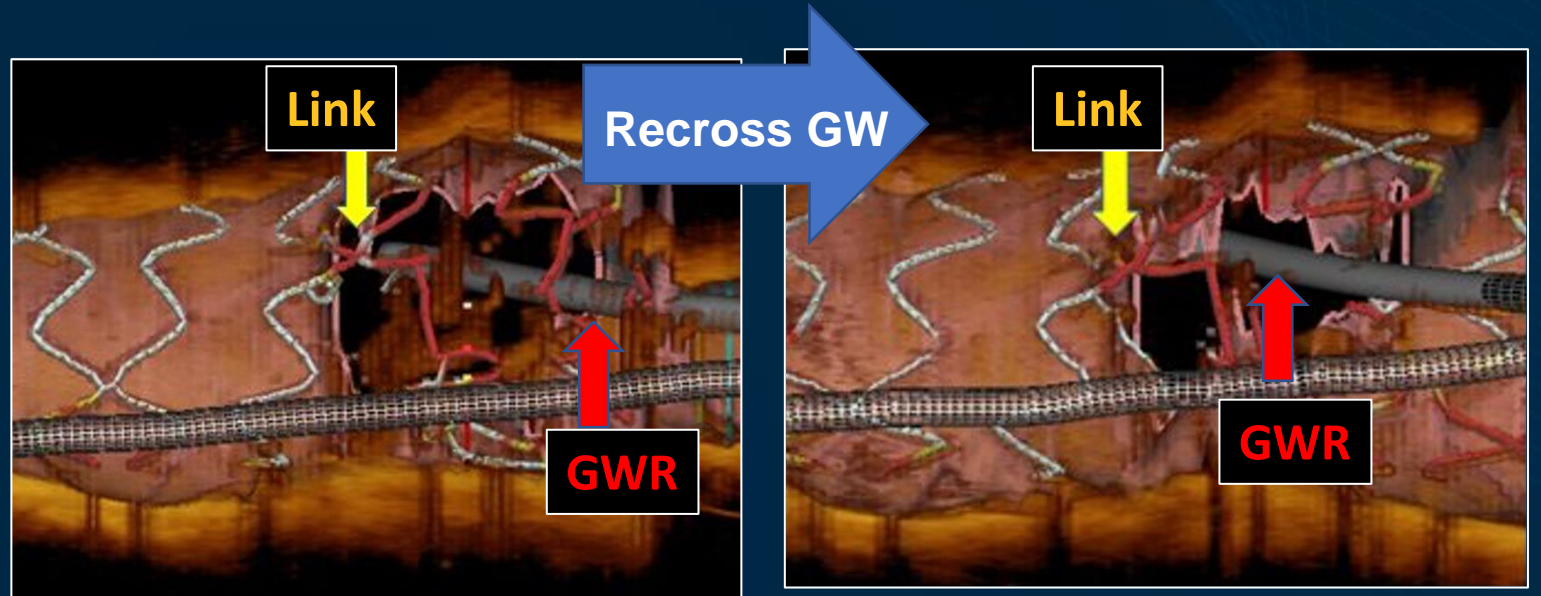
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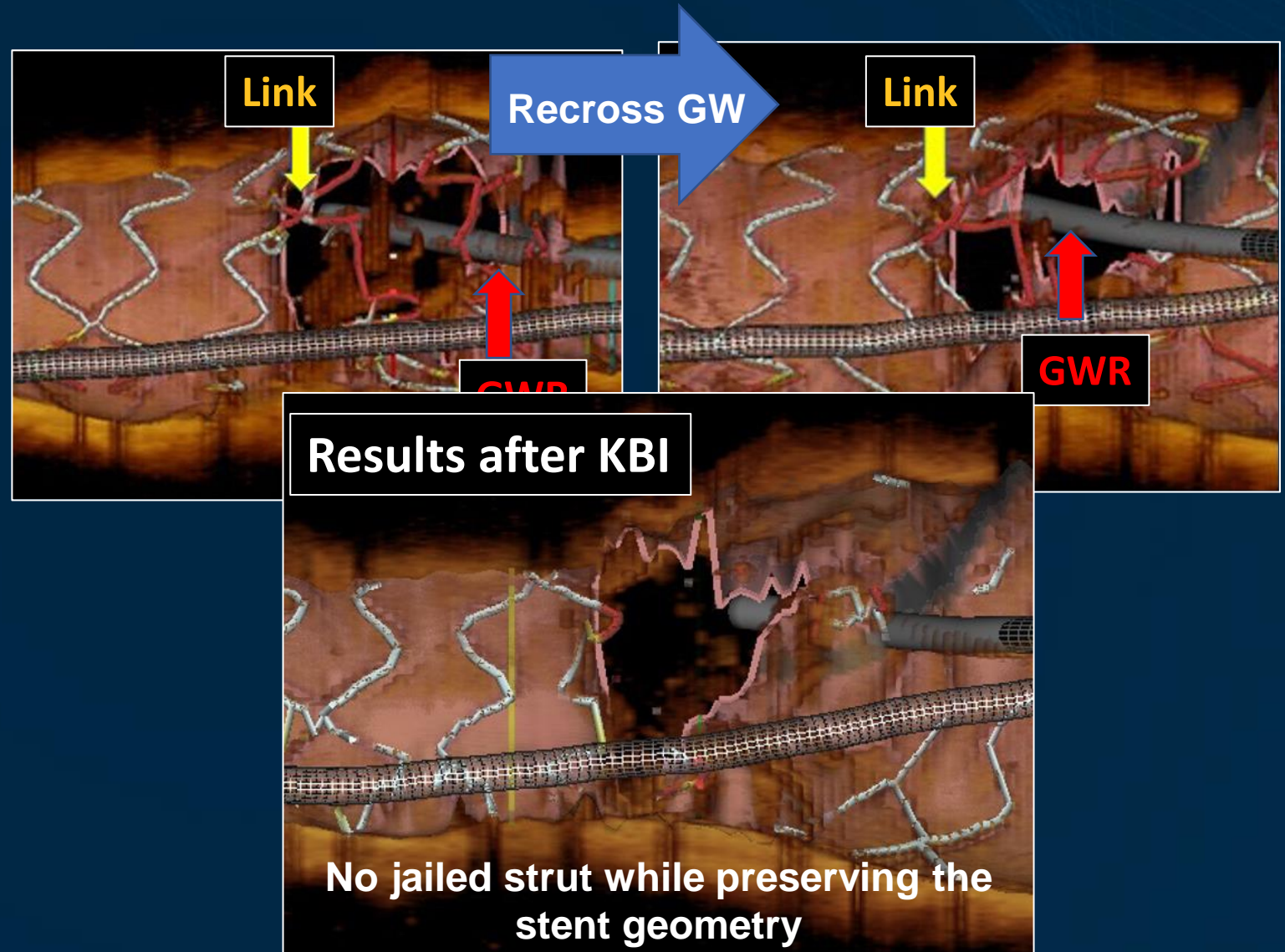
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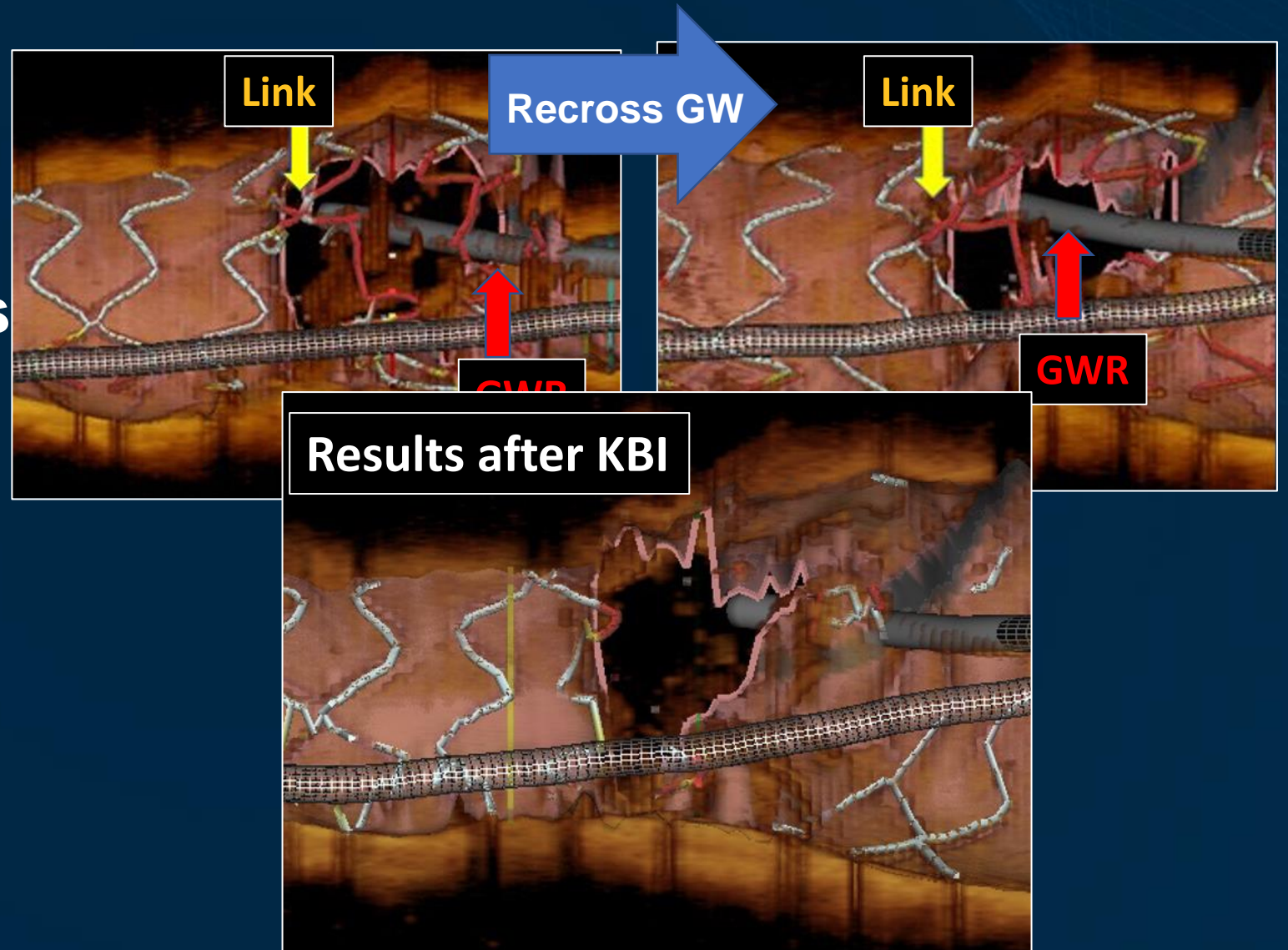
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3D OCT guided KBI

- Aggressive POT may change jailing strut configuration
- **Distal cell is not always optimal cell**
 - Depend on link - carina configuration
- Push fold method to remove link position



Take home message

- 3D OCT imaging guidance in Provisional LMPCI facilitates optimal KBI by **visualizing jailed strut, guidewire recrossing points and stent link configuration**
- Further research with larger randomized studies and long-term follow-up is necessary to better understand the potential benefits of 3D-OCT guided LM provisional strategy