Magmaris Bench Evaluation

EBC 2018

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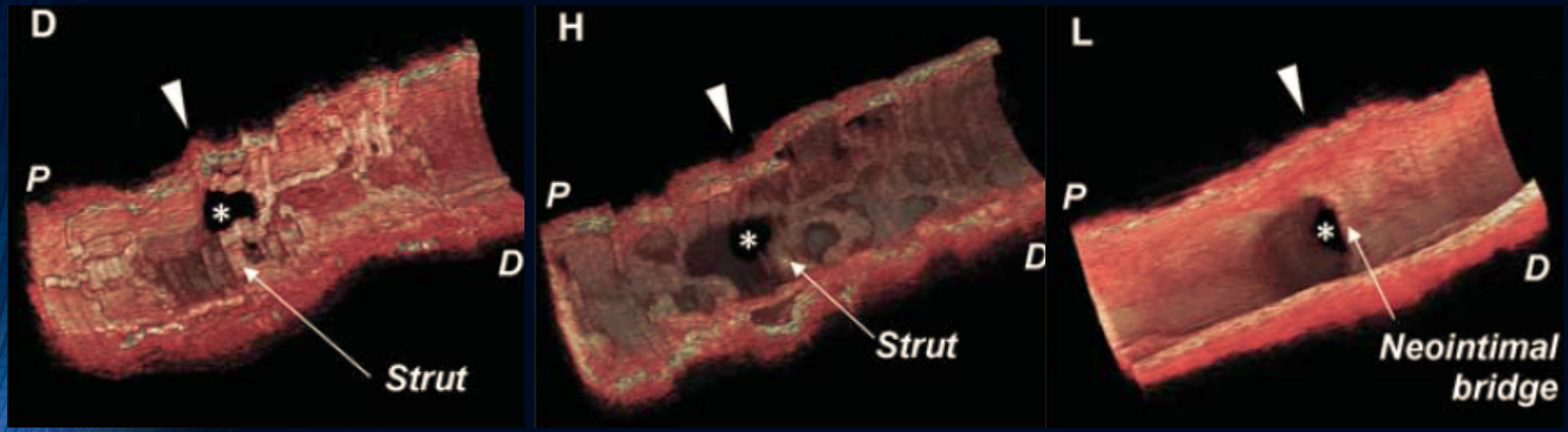
SKEJBY

REGION MIDTJYLLAND

BRS in bifurcations

The appealing consept of bioresorbable stents in bifurcations



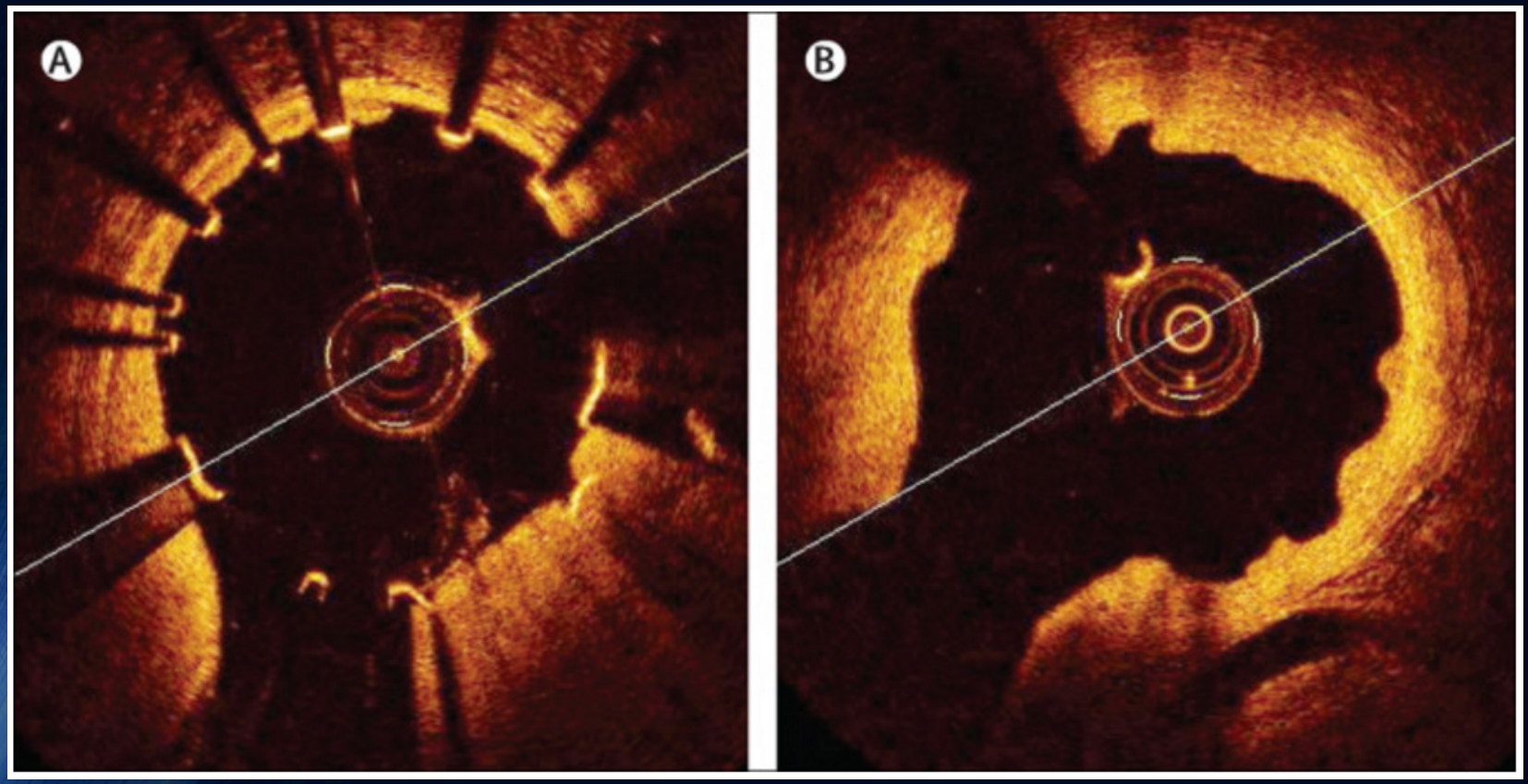
Okamura EHJ 2010

Bifurcation treatment using Absorb BVS is off-lable in USA.

Magnesium scaffold

Baseline

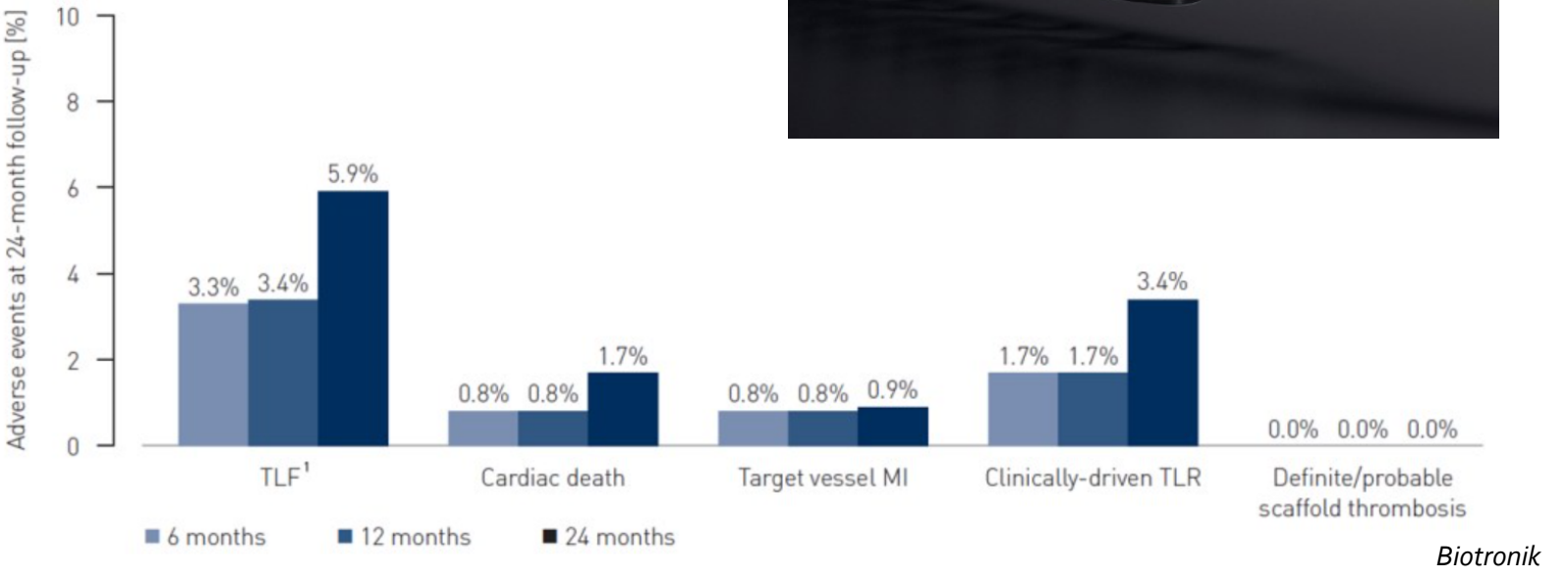
6M FU



Biotronik

Haude et al. Lancet 2015

BIOSOLVE II



Biotronik

Magmaris BRS

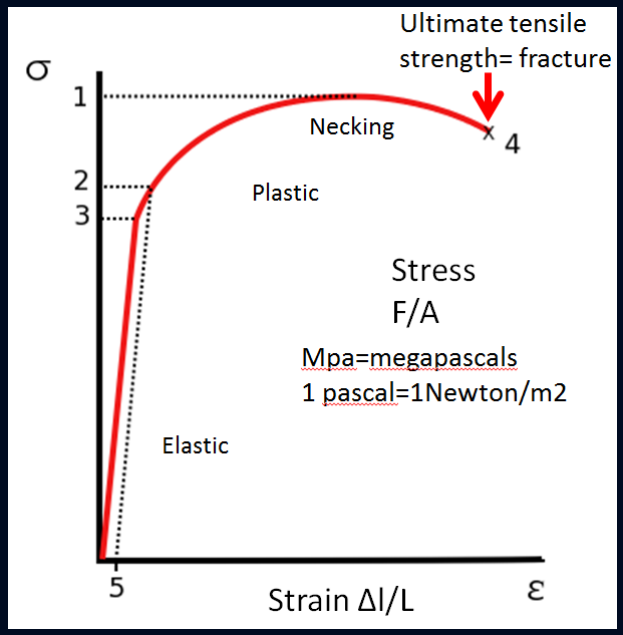
- Magnesium has mechanical properties better than polymers and is anti-thrombotic compared with Absorb
  - Waksman Circ Cardiovasc Interv 2017
  - Onuma Circ Cardiovasc Interv 2017
  - Rukshin Circulation 2002
  - Shechter Am J Cardiol 1999
  - Dong Thromb Haemost
  - Huntsman J Clin Path 1960
  - Huntsman Nature 1960

- This study compared mechanical properties of the Magmaris (magnesium) scaffold with polymeric scaffolds and a second generation metallic stent

Mechanical properties of PLLA, Mg alloy and CoCr

	Young's Modulus, Gpa	Ultimate tensile strength, Mpa	Elongation to break, %
PLLA Absorb	3.1-3.7	60-70	2-6
Magnesium alloy*	**40-45**	**220-330**	**2-20**
Cobalt Chromium Xience	210-235	1449	≈40

Sotomi Circ Research 2017

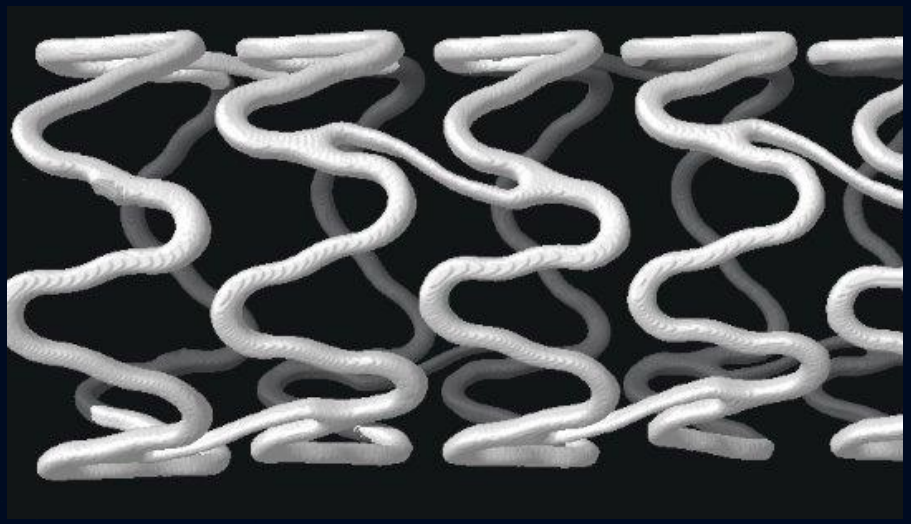


Mg alloy has better qualities than PLLA but is not as good as CoCr

***Magmaris alloy is trimmed to the upper limit of values for Mg.**

Magmaris BRS

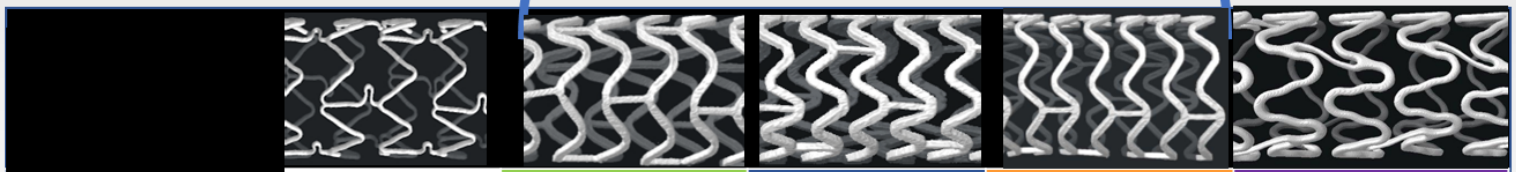
Magmaris design is in phase sinusoidal hoops linked by 2 connectors that join the hoops midway between peaks and troughs



Magmaris have rounded edges to facilitate delivery and endothelialization

Strut dimensions and vessel coverage for BRS and durable DES (3.0mm devices)

DES | **Polymeric BRS** | **Mg BRS**



	ML8/Xience Expedition	Absorb	DESolve	DESolve Cx	Magmaris
Strut thickness	89µm	157µm	150µm	120µm	150µm
Strut width	89-112µm	Hoop 191µm Connector 140µm	Hoop 165µm Connector 100µm	Hoop 165µm Connector 100µm	Hoop 150µm Connector 80-100µm
Strut/vessel coverage (Footprint)	13%	27%	30%	30%	20%

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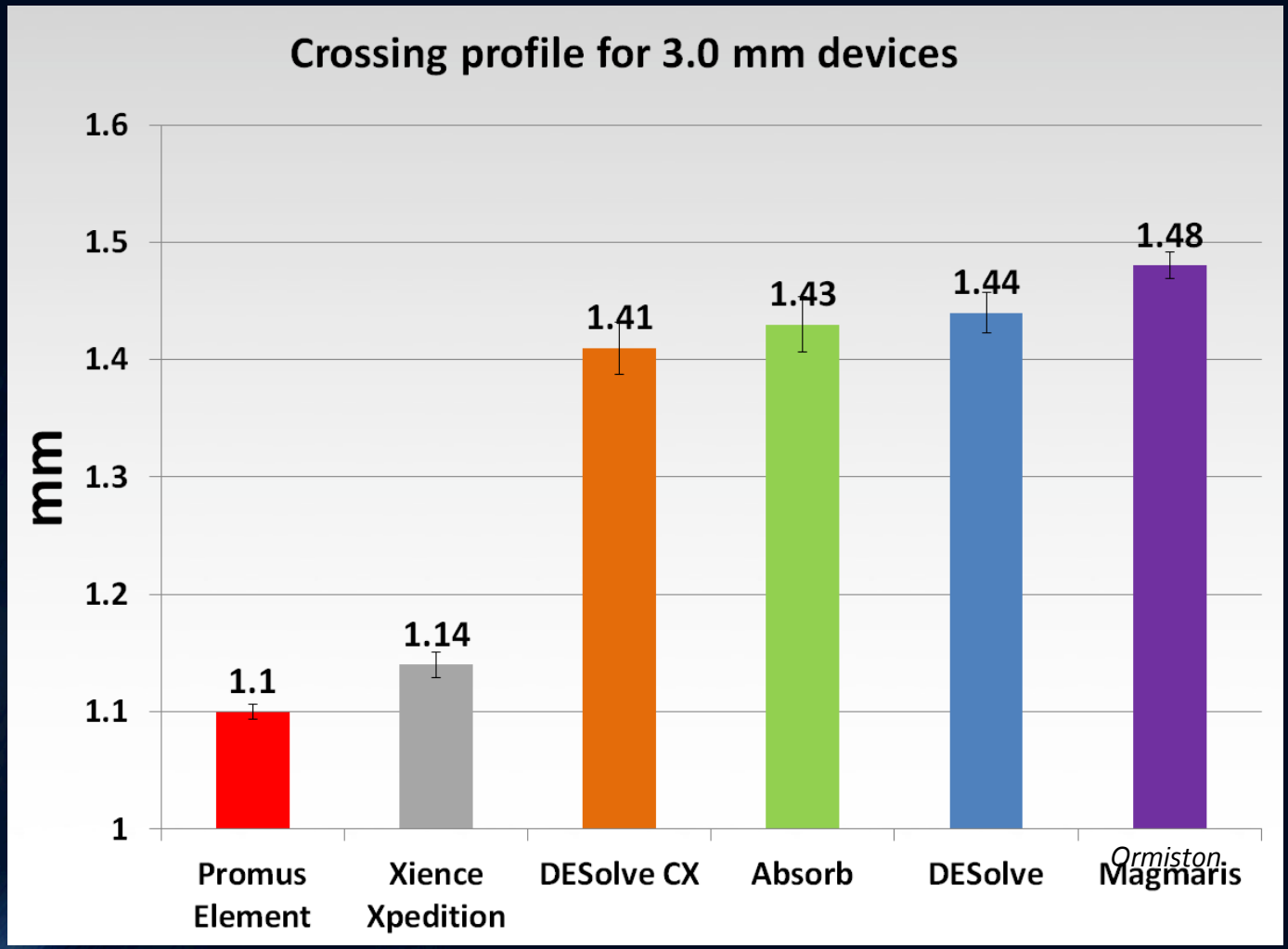
Ormiston

ABSORB is not available for clinical use. DESolve, Fantom and Magmaris are CE-marked but not approved for clinical use in USA

Magmaris Bench Test



Barkholt et al. *in submission*

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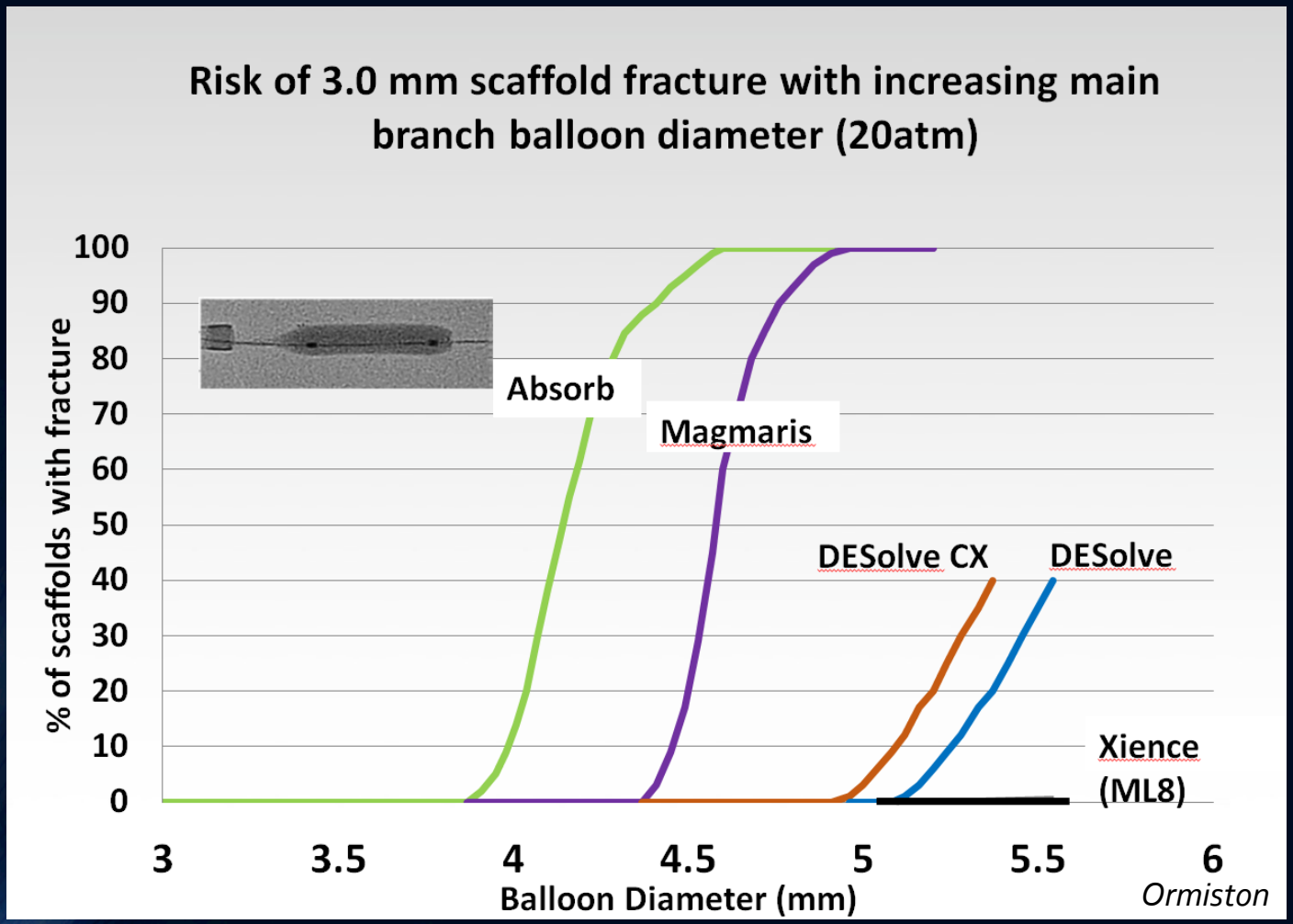
Magmaris Bench: Expansion capacity



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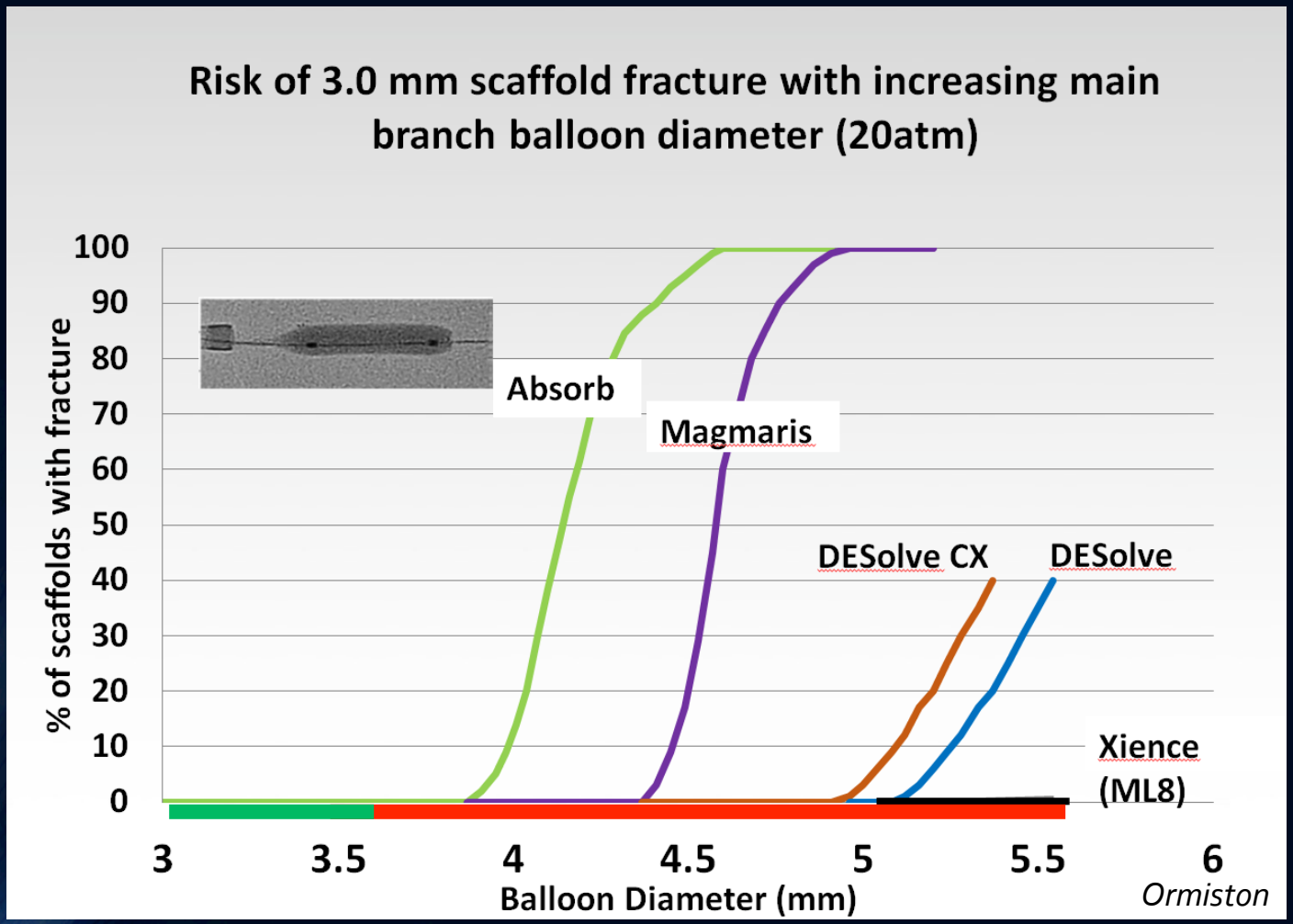

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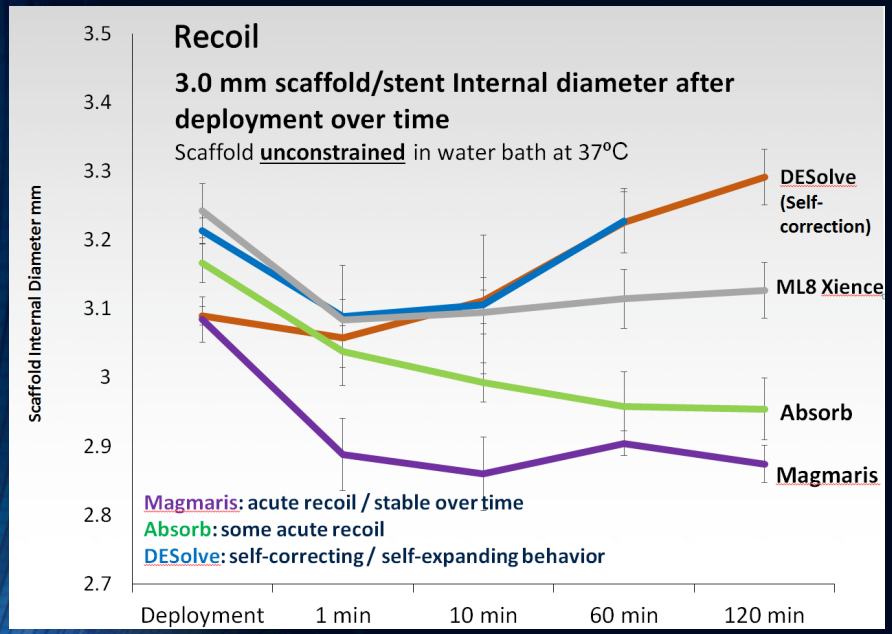
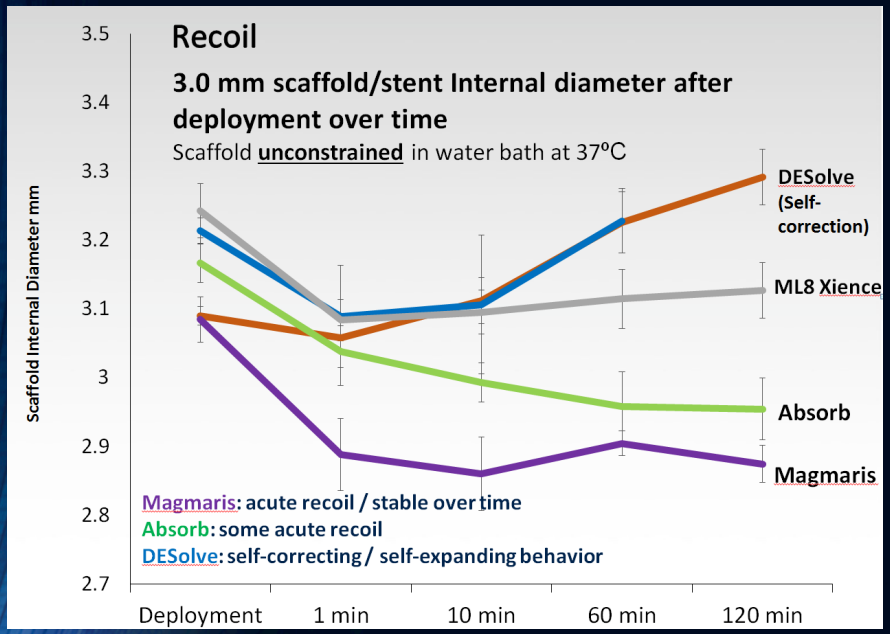
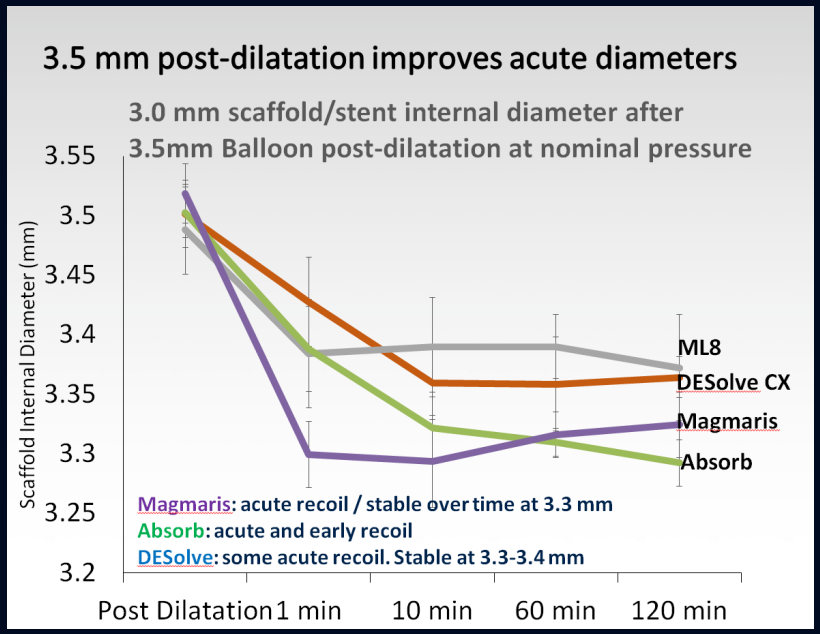
Magmaris Bench: Recoil – first 120 min



Magmaris Bench: Recoil – first 120 min

Post dilate with a +0.5 mm NC balloon





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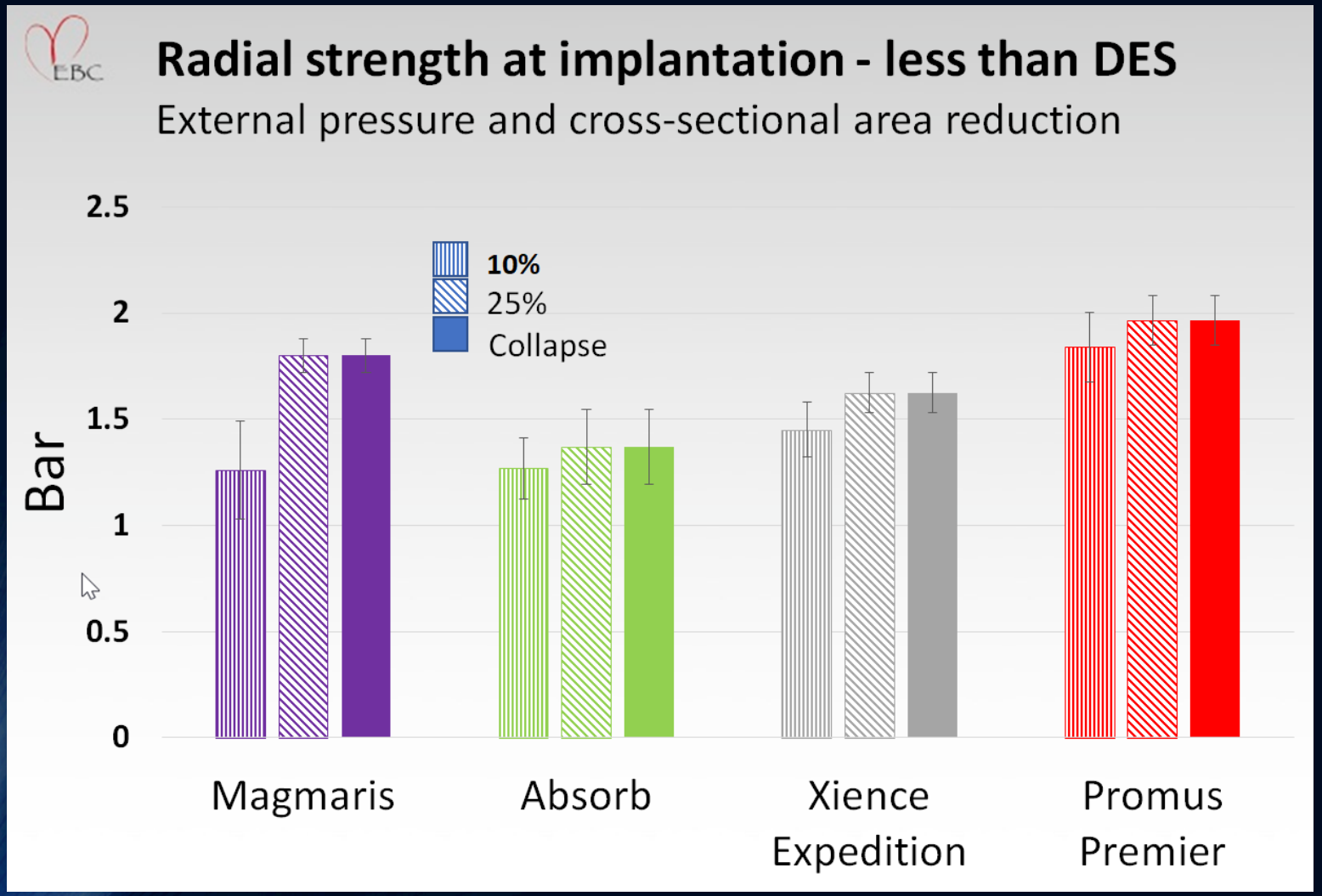
Magmaris Radial strength



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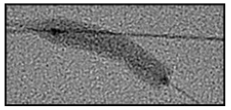
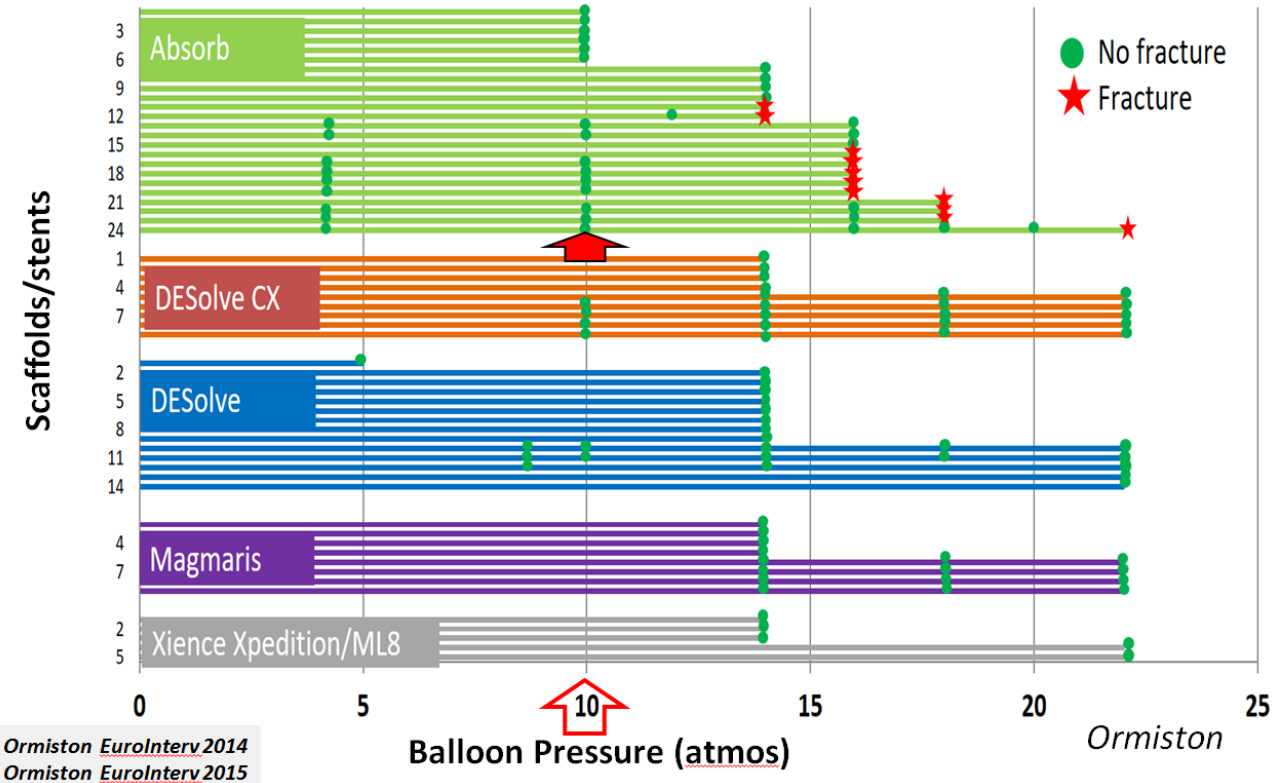
Magmaris SB cell expansion capacity

3.0mm Side-branch balloon dilatation pressure and strut fracture in 3.0mm scaffolds/stents

10 atm is a safe threshold for Absorb. Others did not fracture





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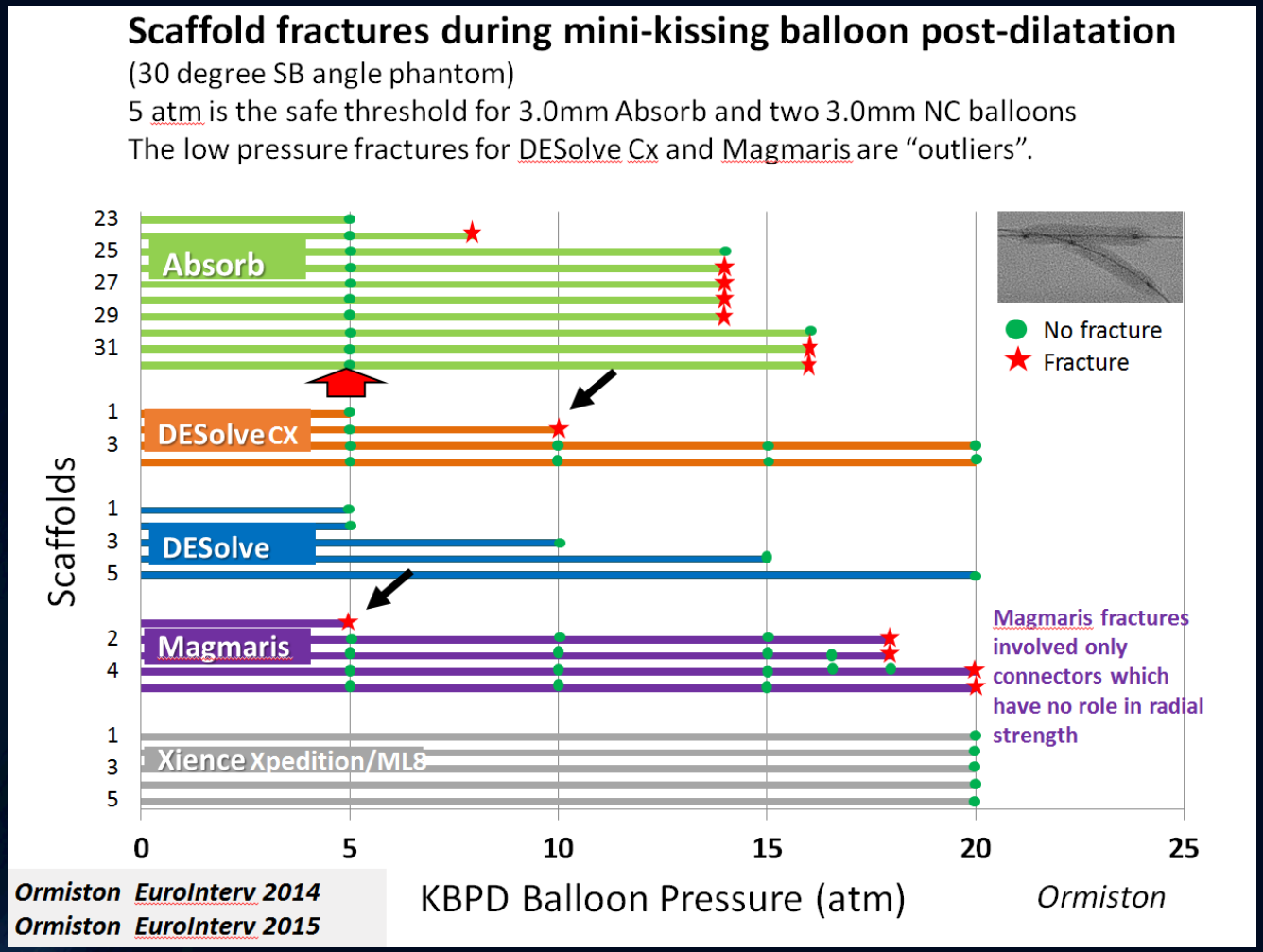
Magmaris The Mini Kiss



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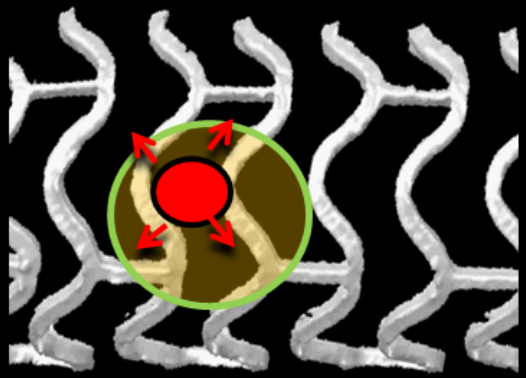
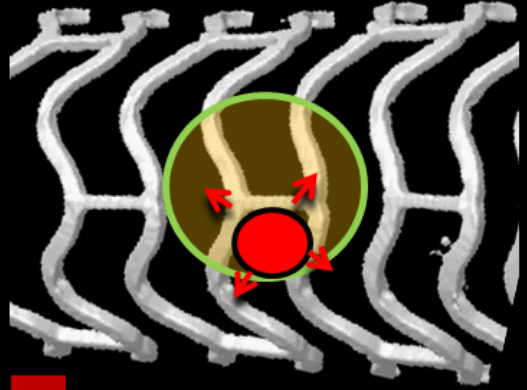
Strut damage is not always predictable

Struts are more fixed in B, scaffold expansion
→ potential for strut rupture

One reason a 2.5mm balloon may sometimes cause strut fracture even in 3.5mm scaffold



A **Strut fracture less likely**



B **Strut fracture more likely**

=Side branch ostium

=Balloon uninflated

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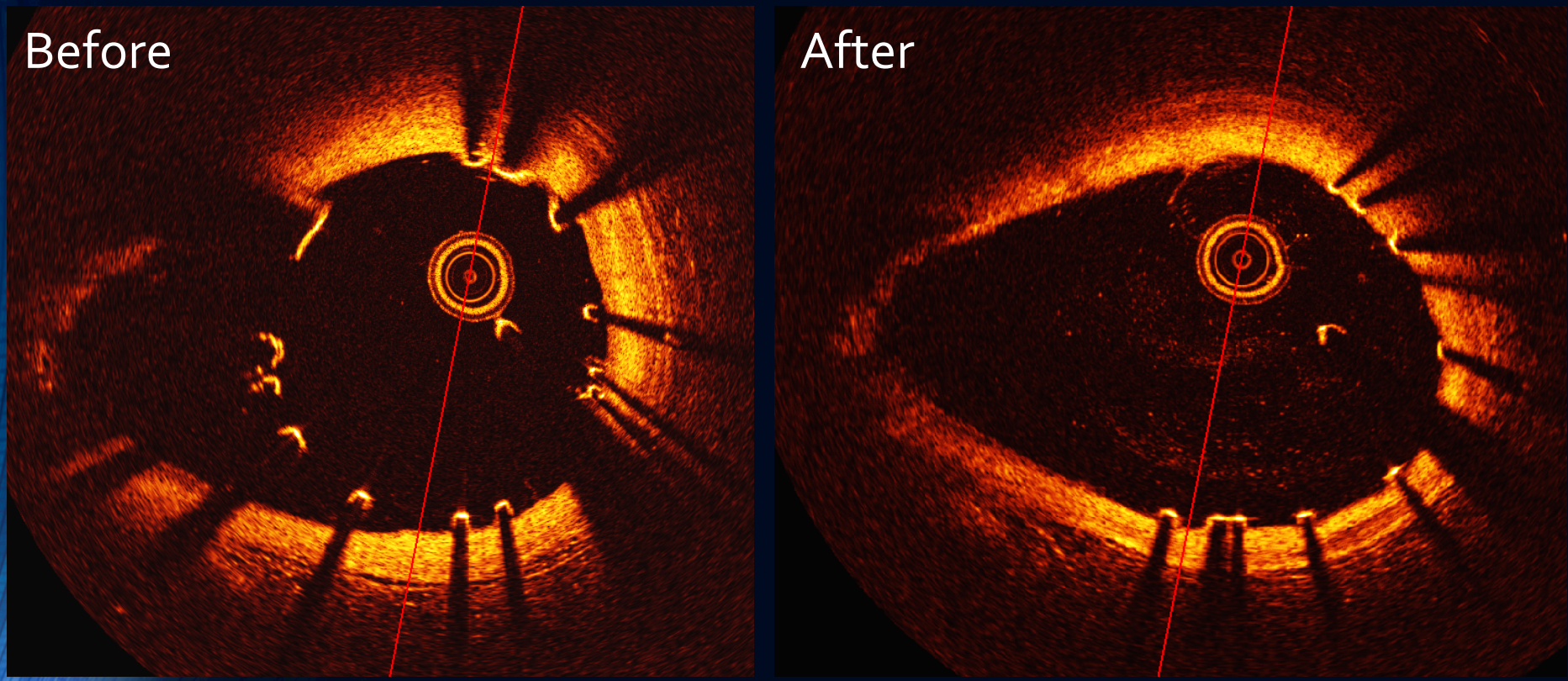
Magmaris The Mini Kiss



BIFSORB Pilot II

Magmaris Real World..

BIFSORB Pilot II

Magmaris in bifurcations

Summary

Magnesium has mechanical properties better than polymers and is anti-thrombotic compared with Absorb

The Magmaris has thinner, narrower and more rounded struts than Absorb and wall coverage (footprint) is less

With post-dilatation, Magmaris is more resistant to fracture than Absorb but less resistant than DESolve and metallic durable DES

The Magmaris crossing profile is similar to Absorb but larger than metallic durable DES

Thank you

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Thank you for your attention

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