

TCT 2010

A “Matching” Lumen Tapering Balloon: The Conical Balloon Concept

Alessandro S. Bortone MD, PhD
FESC, FAHA, FACC, FSCAI

Interventional Laboratory - Institute of Cardiac Surgery
University of Bari - ITALY



품명: 풍선확장식관상동맥관류형혈관형성술용카테터(수허:12-587호)
"이 제품은 "의료기기"이며, "사용상의 주의사항"과 "사용방법"을 잘 읽고 사용하십시오"
"광고심의필 : 심의번호 2013-ET1-11-0143"

Advantages Coronary Anatomy

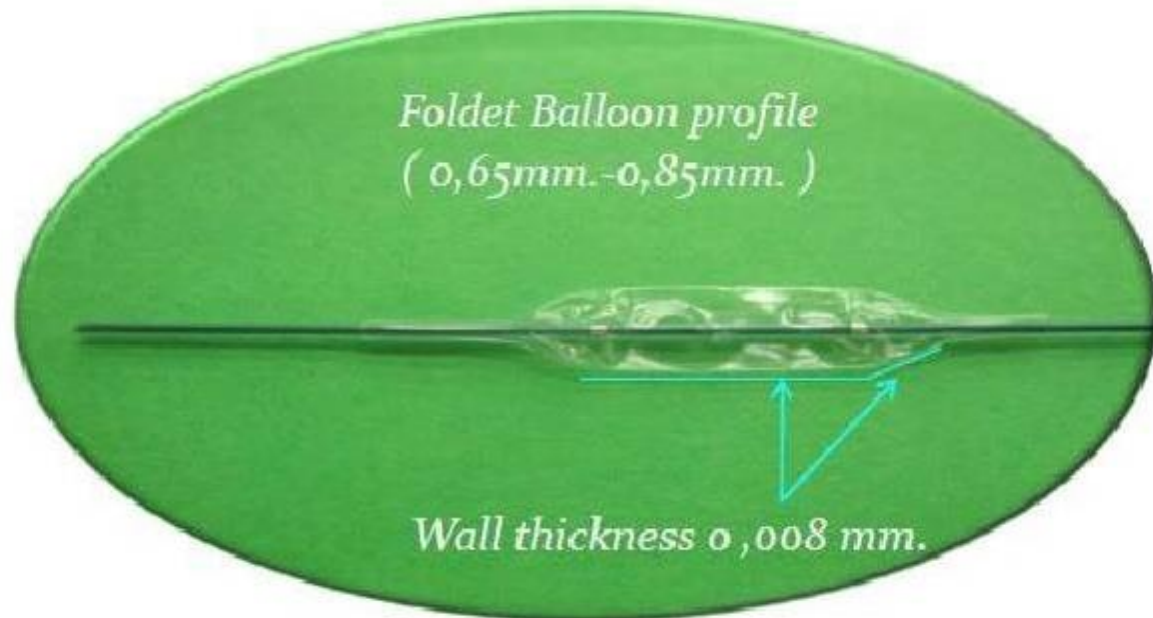


Conic One

***PTCA BALLOON CATHETER
(Semi compliance and High Pressure)***

Balloon Material

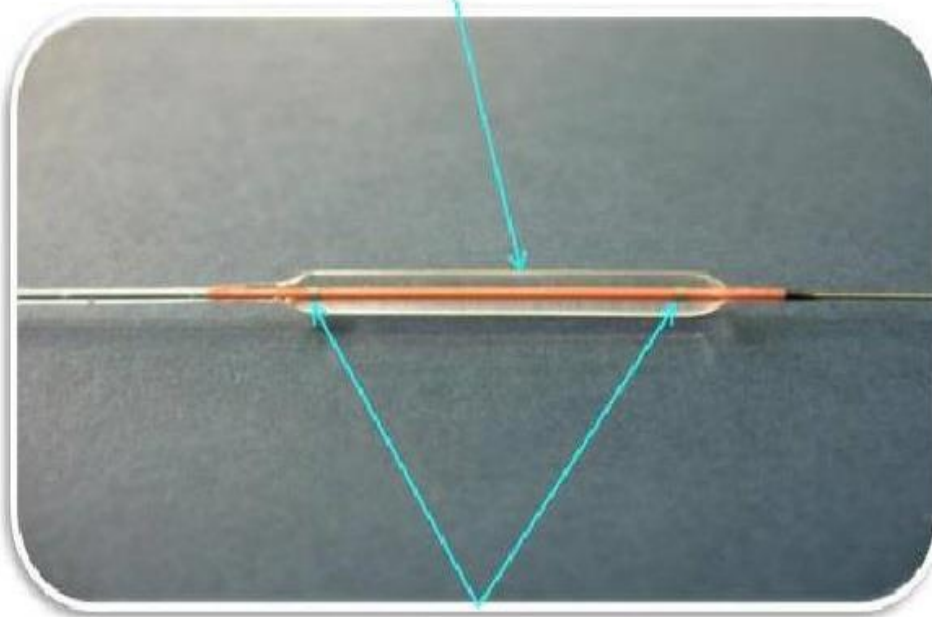
Nylon L 25



*The market thin wall,
The same along the balloon,
It works even up to 25 BAR*

Balloon Features

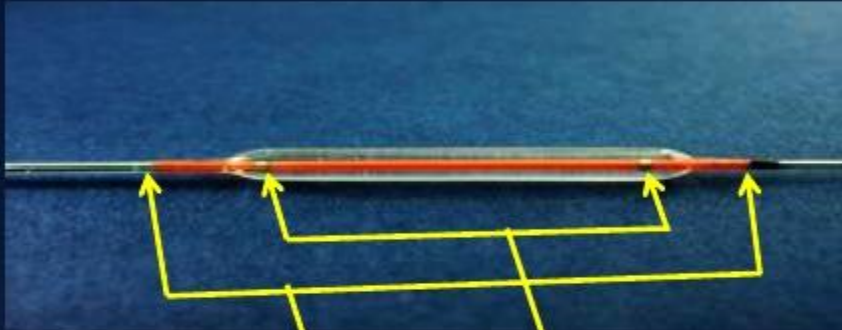
High Distal Flexibility (NEW DESIGN)
Free Guide even High Pressure (CTO)



Marker 0,6 mm.

Advantages

Characteristics



Soft tubing

Short Markerbands

More Flexibility

NOMINAL DIAMETER
RBP

6BARS
18BARS

HIGH FLEXIBILITY

DISTAL PART

CONTROLLED BALLOON COMPLIANCE

BALLOON WALL
THICKNESS

0,008MM

FAST DEFLATION
TIME

0 ~6 sec

G.WIRE
G.CATHETER

0,014"
5F (0,058)

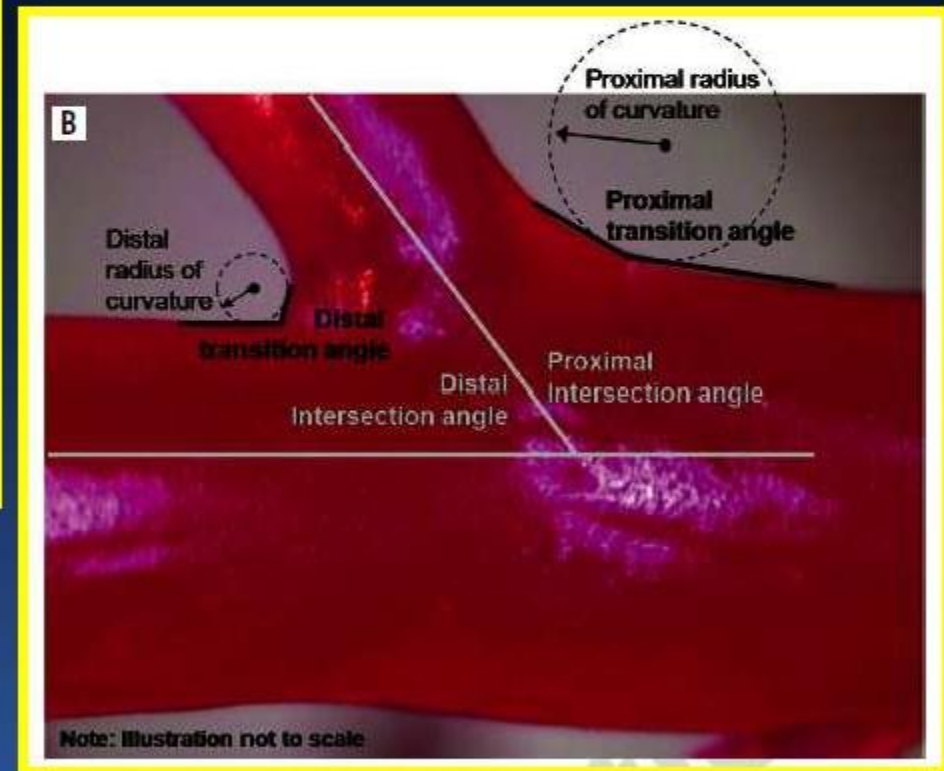
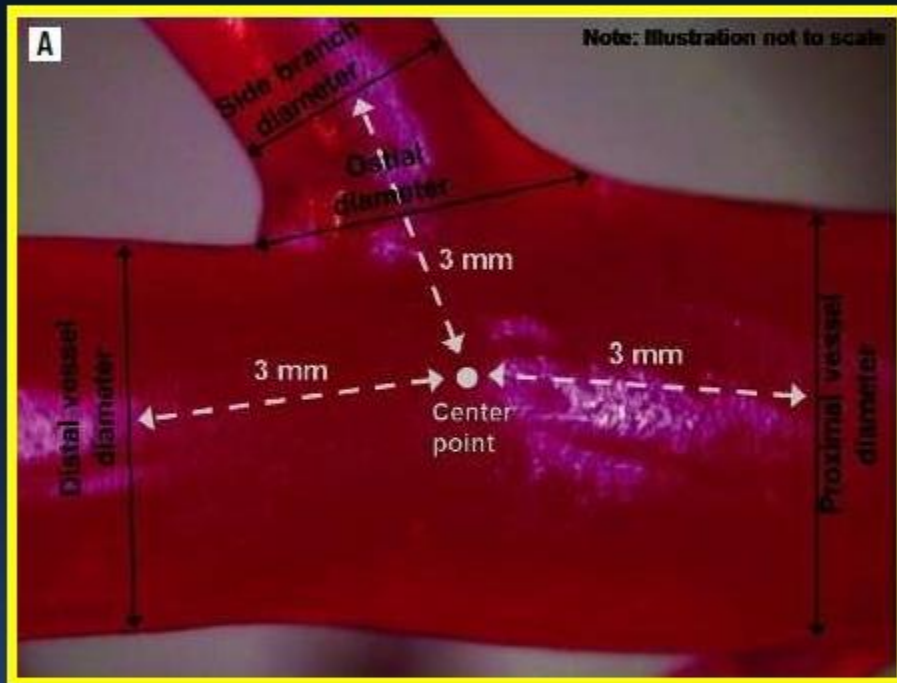
ENTRY TIP PROFILE
BLACK TIP LENGTH

0,43MM (0,017")
2,0MM ± 0,2MM

FOLDED BALLOON
PROFILE OVER DISTAL MARKER

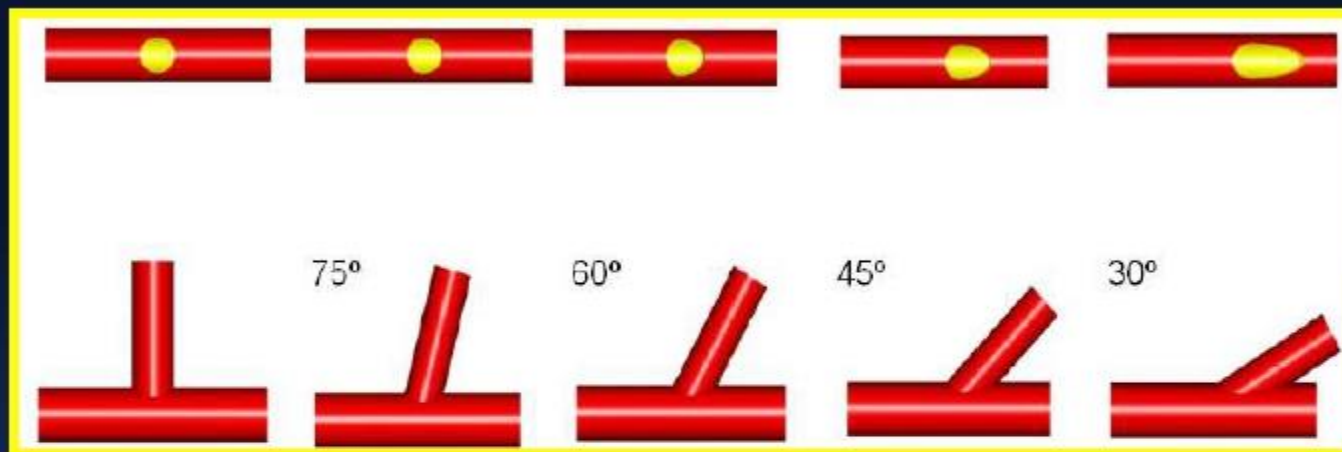
(0,65MM ~0,85MM)

PTCA Catheter: Conic for Bifurcation



EuroIntervention 2009;5:96-103

PTCA Catheter: Conic for Bifurcation



Vessel branches	N	Vessel taper* (mean±SD)		Ratios (mean±SD)	
		Main vessel proximal to distal (mm taper per mm vessel)	Ostium to side-branch (mm taper per mm vessel)	Linear law ratio	Murray (3rd) law ratio
1 st Branches	40	0.08±0.07	0.20±0.30	0.66±0.09	1.15±0.46
LAD	16	0.10±0.07	0.20±0.36	0.67±0.09	1.23±0.54
LCX	12	0.08±0.07	0.17±0.31	0.65±0.08	1.12±0.44
RCA	12	0.06±0.06	0.22±0.23	0.64±0.09	1.07±0.39
Female	19	0.08±0.07	0.21±0.34	0.64±0.09	1.12±0.54
Male	21	0.08±0.07	0.18±0.27	0.67±0.08	1.17±0.40
Distal branches	25	0.07±0.07	0.20±0.29	0.66±0.11	1.20±0.69

LAD: left anterior descending artery; LCX: left circumflex artery; RCA: right coronary artery; *Main vessel taper: proximal diameter minus distal diameter divided by length between the two diameter measurements (i.e. taper length); side-branch taper: ostial diameter minus SB diameter divided by taper length.

EuroIntervention 2009;5:96-103

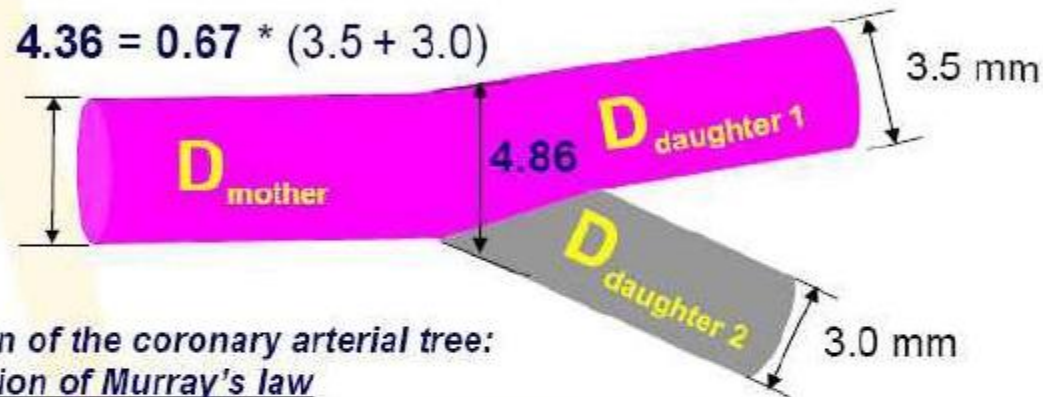
PTCA Catheter: Conic for Bifurcation

Perimeter of Intersection

Side Branch	Main Vessel				Side Branch	Main Vessel			
	30°	3.0mm	3.5mm	4.0mm		45°	3.0mm	3.5mm	4.0mm
2.5mm	12.8mm	12.5mm	12.4mm		2.5mm	10.2mm	9.9mm	9.8mm	
3.0mm	NA	15.5mm	15.1mm		3.0mm	NA	12.3mm	2.0mm	
3.5mm	NA	NA	18.1mm		3.5mm	NA	NA	14.4mm	



PTCA Catheter: Conic for Bifurcation



*On the design of the coronary arterial tree:
a generalization of Murray's law*

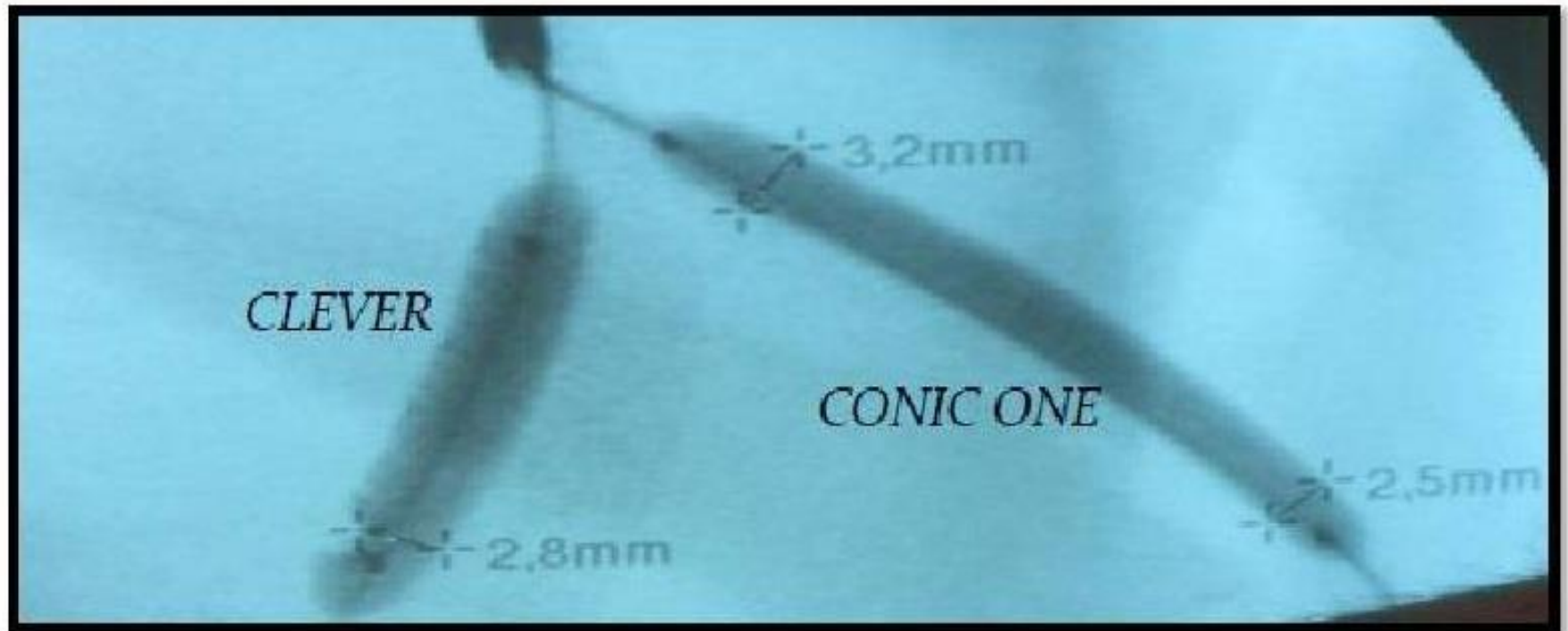
$$D_{\text{mother}} = 0.67 * (D_{\text{daughter 1}} + D_{\text{daughter 2}})$$

Yifang Zhou et al. Phys. Med. Biol. 44 (1999) 2929–2945.

Stent cell circumference (not area!) should preferably be as large as the ostium circumference ($\pi.D$)

Clever / Conic One

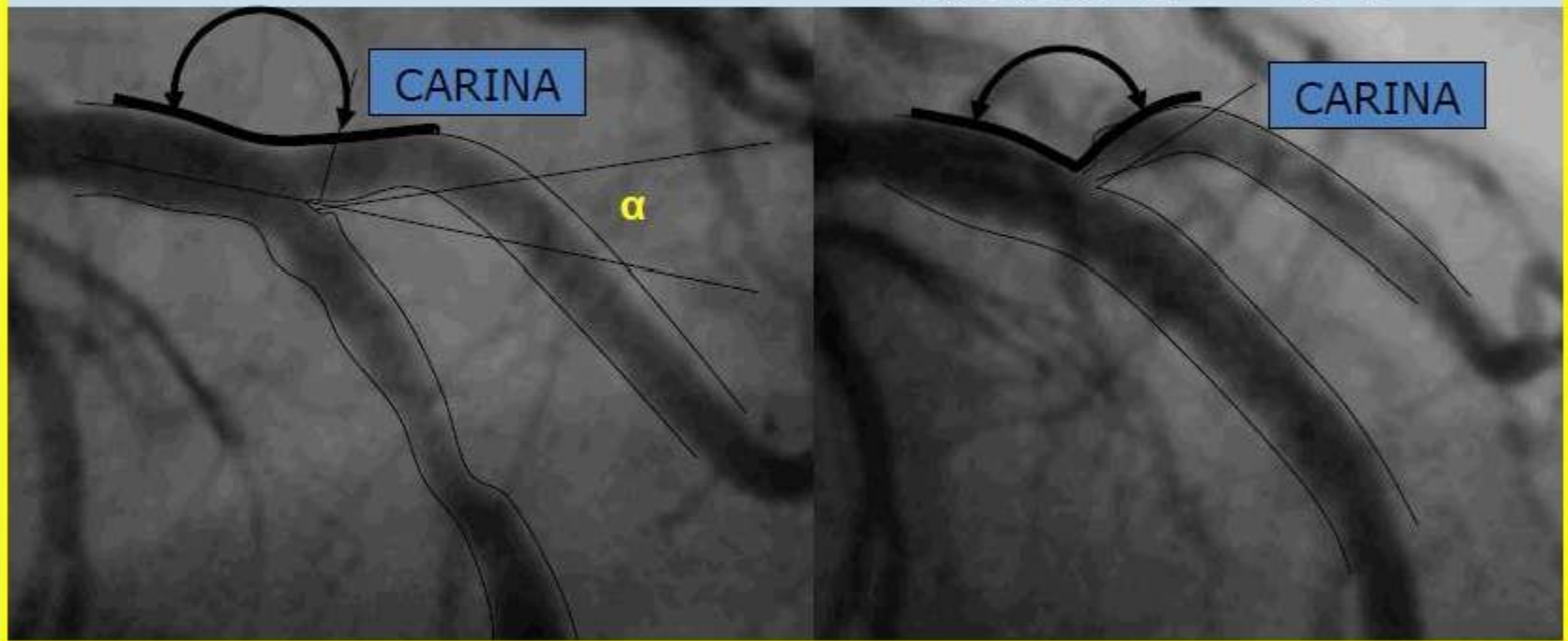
Conic One (Patented by Conic Vascular)



(Kissing system) 2 Catheters by Guide Catheter

PTCA Catheter: Conic for Bifurcation

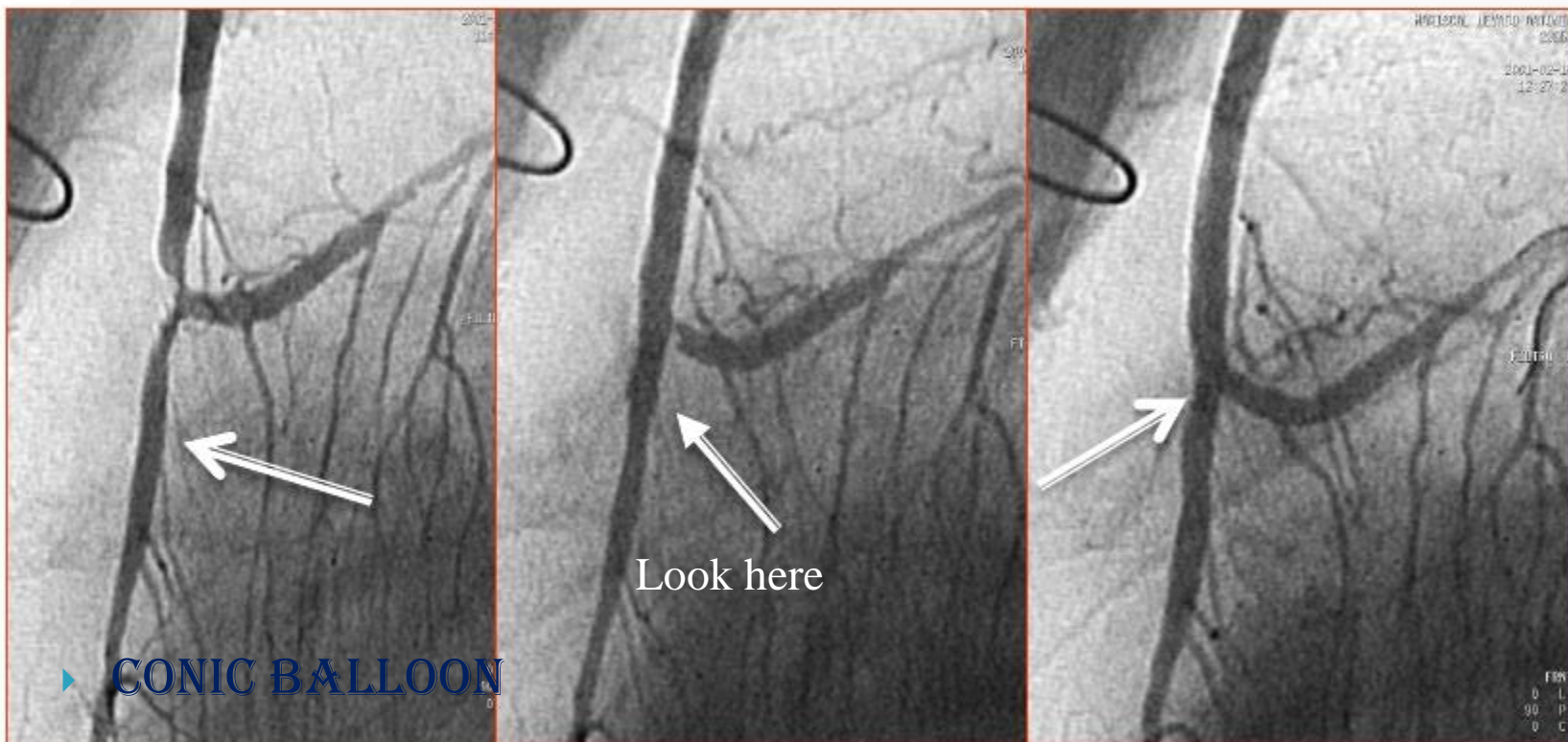
angle $\alpha = 23$ deg., $\cos \alpha = 0.92$ -> predicted %DS = 92%
observed %DS = 95%





CONIC ARTERY - WHY CONIC BALLOON

Everydayproblems

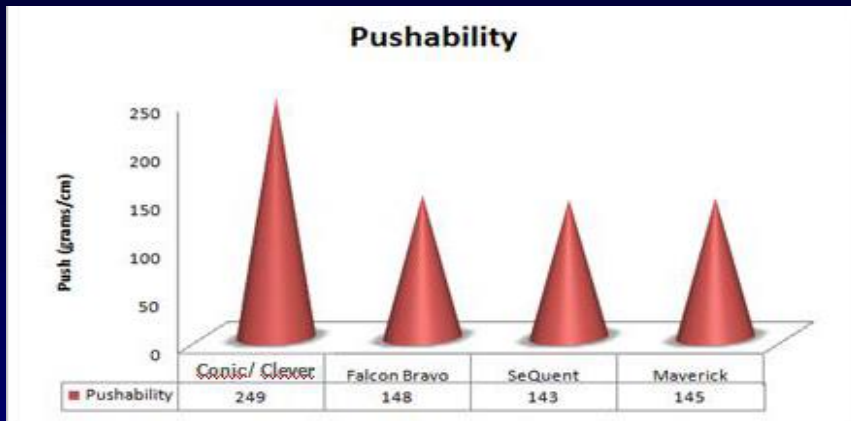


CONIC BALLOON

Test Results

(Pushability, Trackability, Pullout of G.Catheter, Flexibility Balloon area)

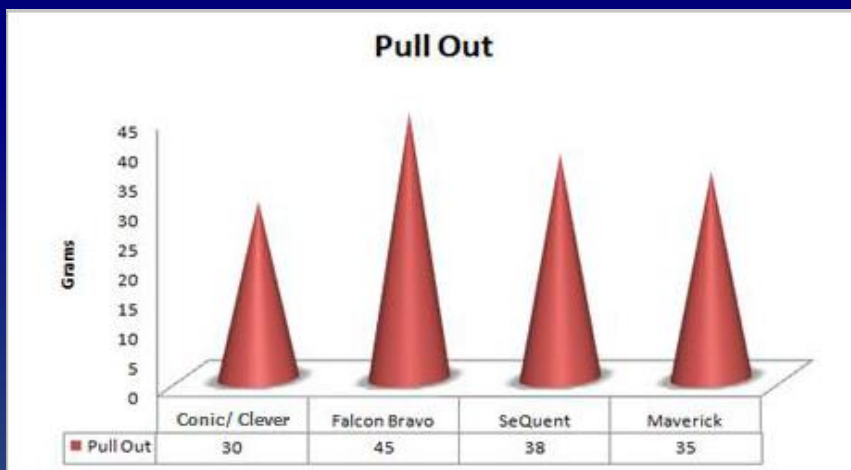
Pushability-Conic One/Clever



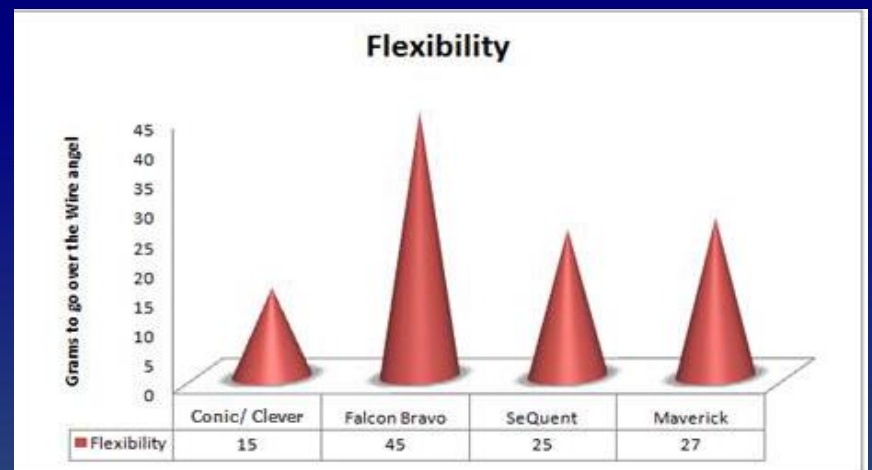
Trackability-Conic One/Clever



Pull out-Conic/Clever



Flexibility on Balloon area



Distorted Balloon Shape During Predilatation Before Stenting Predicts Stent Underexpansion

***Hiroyuki Shibata¹, Shinichiro Yamada¹,
Takatoshi Hayashi¹, Tomofumi Takaya¹, Naoki Miyoshi¹,
Shougo Oishi¹, Yasuyo Tainiguchi¹, Katsunori Okajima¹,
Akira Shimane¹, Kiminobu Yokoi¹, Gaku Kanda¹, Seiichi
Kobayashi¹, Takayoshi Toba¹, Mitsuhiro Yokoyamada¹***

Department of Cardiology, Himeji Cardiovascular Center

Background 1

- **Suboptimal stent expansion has become recognized as an important risk factor not only for drug-eluting stent (DES) failure (restenosis) but also for the more serious and rare event of stent thrombosis.**
- **The cause of stent underexpansion seems to be on the hardness of lesion, however, it is hard to know the information of such lesion hardness from angiography.**

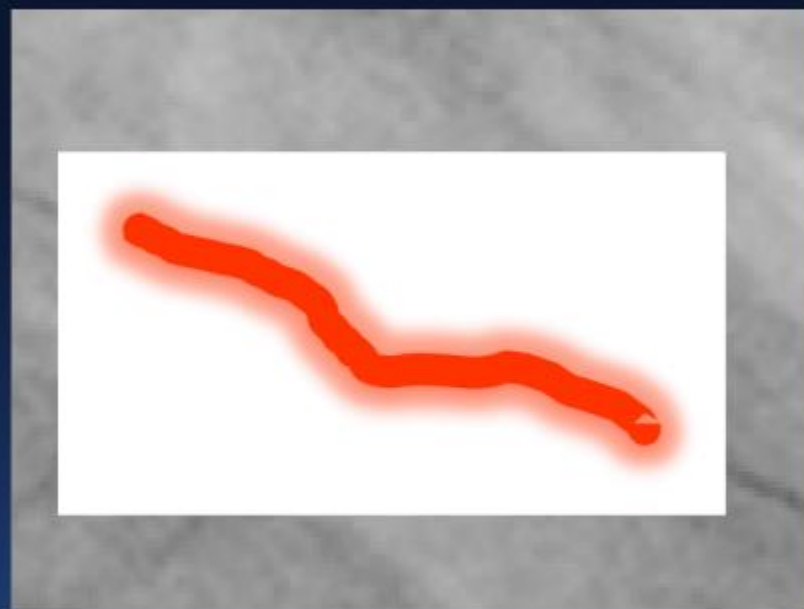
Background 2

- **We focused on the shape of balloon during pre-stent dilatation as a predictor of lesion hardness and as a result, stent underexpansion.**

Balloon figure



***Straightened
shape***



***Distorted
shape***

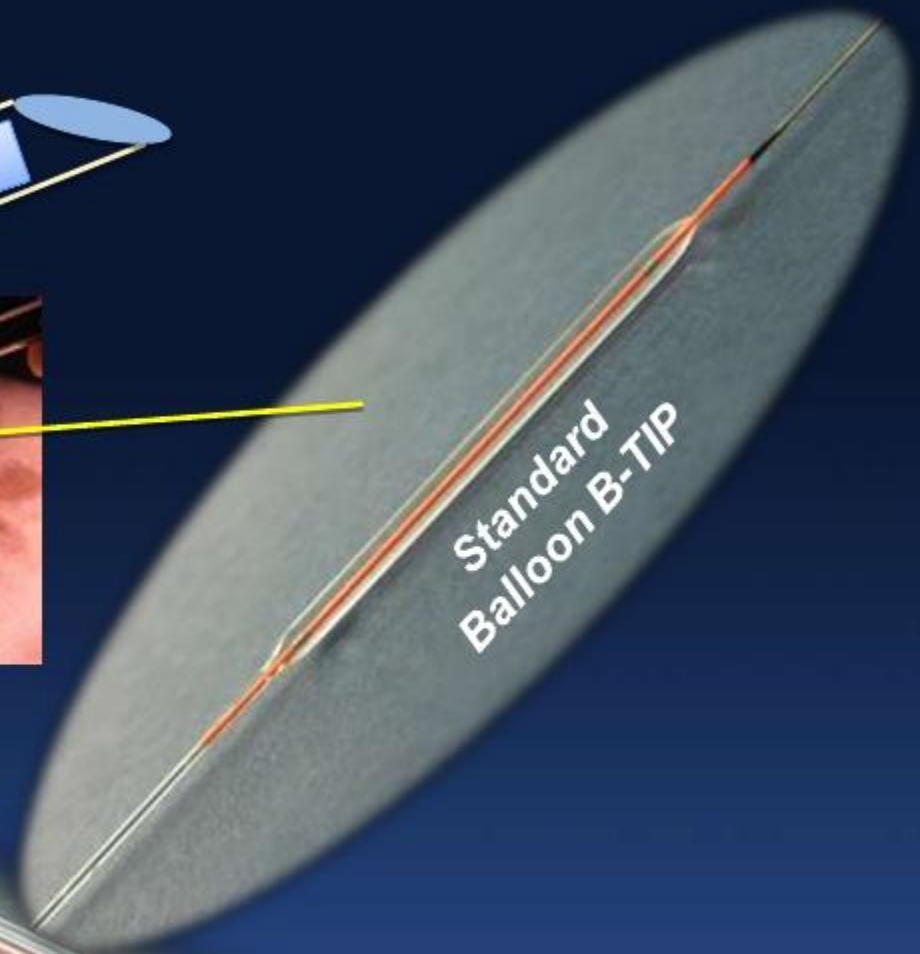
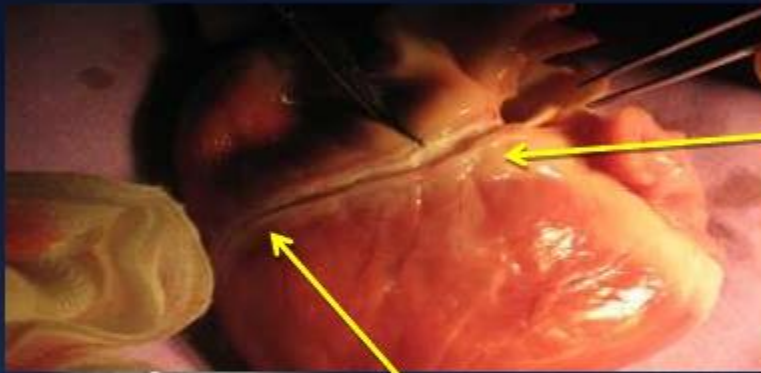
Summary

- **If balloon figure at the time of pre-stent dilatation looks distorted in calcified lesions, it predicts stent underexpansion and asymmetry.**
- **Ischemic-driven TLR of distorted balloon figure group was higher than straightened balloon figure groups.**

Conclusion

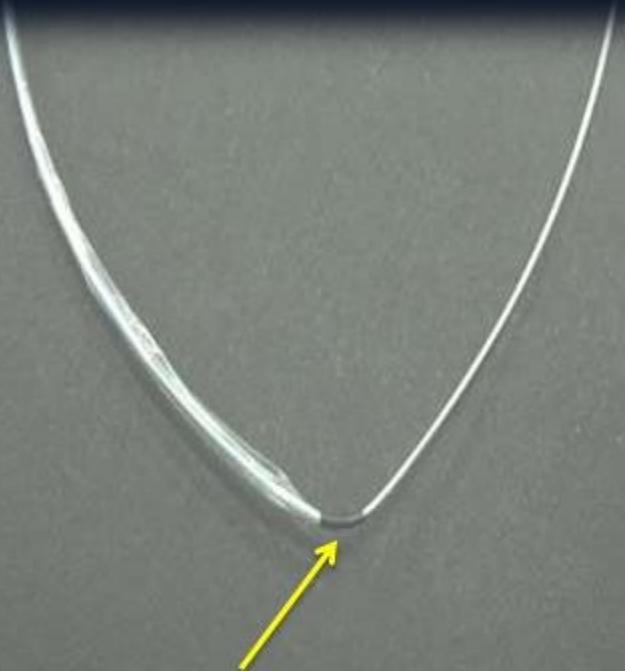
- **Distorted shape of balloon during predilatation can serve as a useful predictor of DES underexpansion.**
- **To prevent the future serious events, higher pressure stent implantation, and if required from IVUS result, post dilatation using high pressure balloon is recommended when predilatation balloon looks distorted.**

B-Tip




B-TIP at Wire angle

Balloon
inflated, 8 bar



*Long part
of Tip,
OUT side
the wire
angle*



*Long part
of Tip, **IN**
side the
wire
angle*

B-TIP vs Standard

50% \emptyset
MATERIAL



100% \emptyset
MATERIAL

