Inflation with or without drugs BTK?

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Disclosure

Roberto Ferraresi, MD

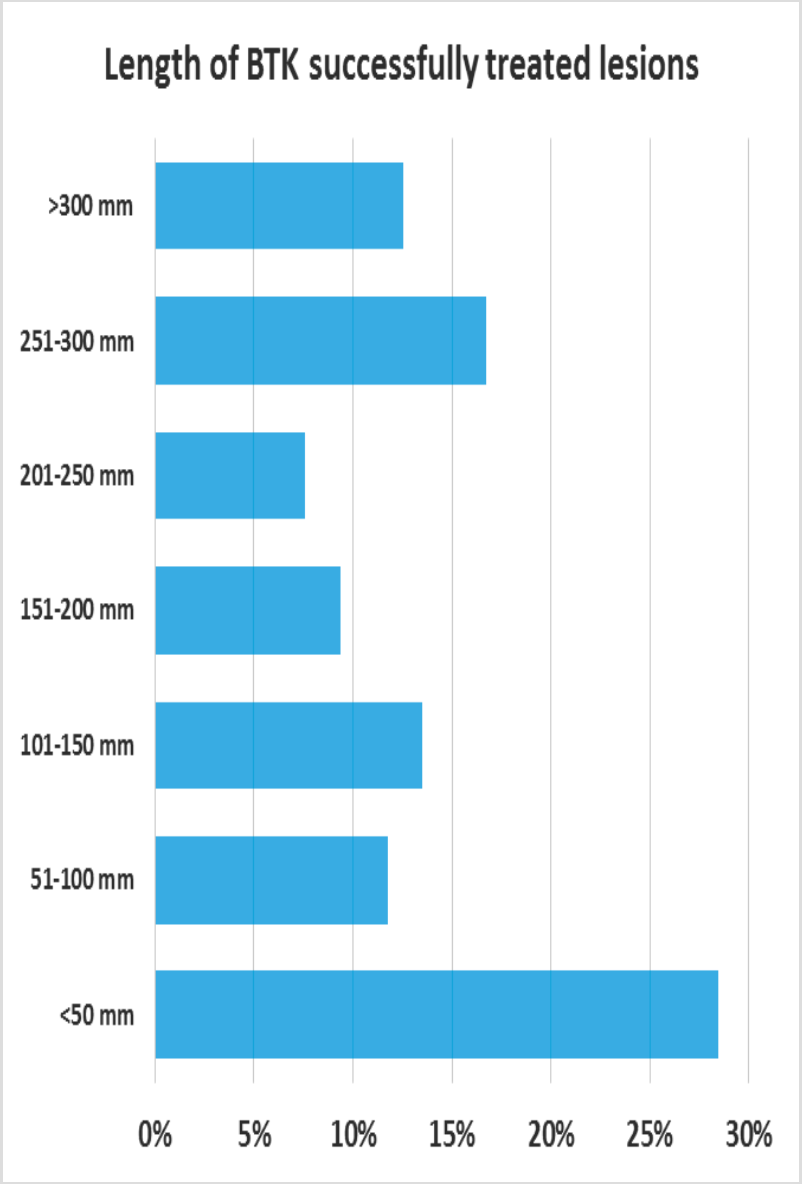
I have the following potential conflicts of interest to report: consulting, travel reimbursement, teaching courses, training, proctoring:

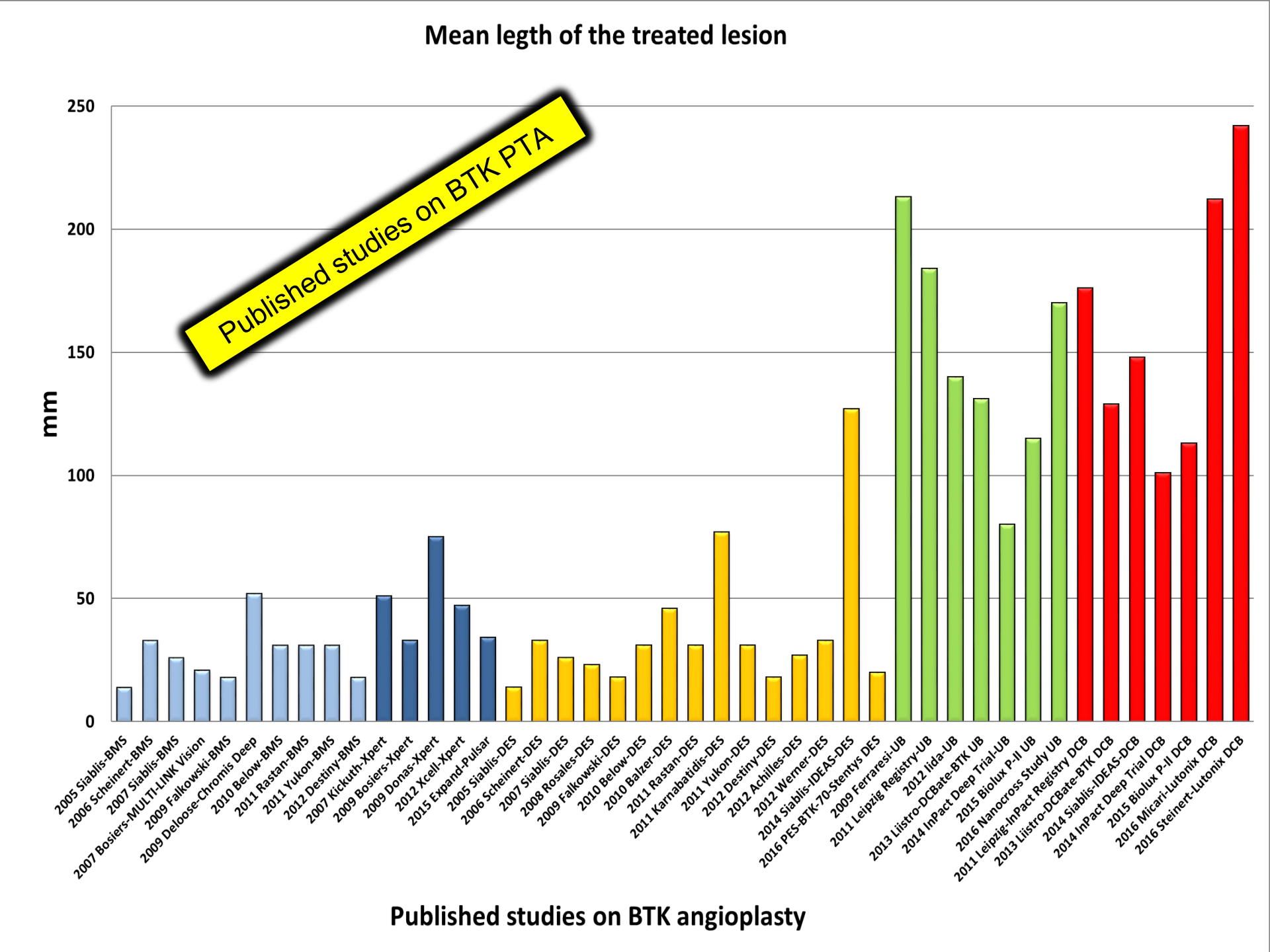
- Medtronic
- Boston Scientific
- Abbott
- LimFlow
- Terumo
- Cook
- Biotronik
- Asahi
- Shire
- Ivascular

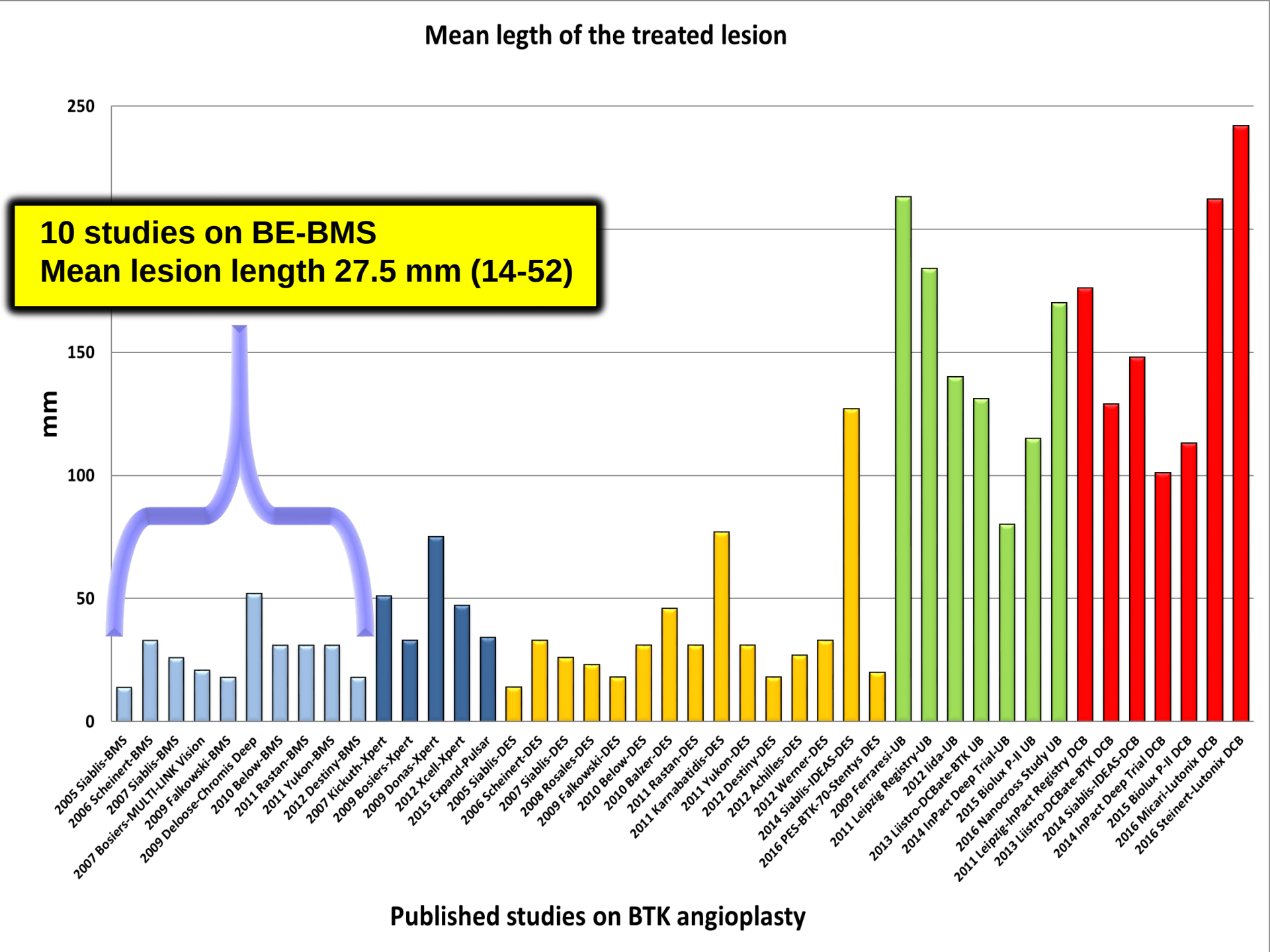
Inflation with or without drugs BTK?

1. The scenario of BTK angioplasty
2. UB POBA published data
3. DCB POBA published data
4. Conclusion

My last 2000 PTA on CLI pts: 3683 successfully treated lesions in BTK vessels




Mean legth of the treated lesion
Published studies on BTK PTA
mm
250
200
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
2011 Yukon-BMS
2012 Destiny-BMS
2007 Kickuth-Xpert
2009 Bosiers-Xpert
2009 Donas-Xpert
2012 Xcell-Xpert
2015 Expand-Pulsar
2005 Siablis-DES
2006 Scheinert-DES
2007 Siablis-DES
2008 Rosales-DES
2009 Falkowski-DES
2010 Below-DES
2010 Balzer-DES
2011 Rastan-DES
2011 Karnabatidis-DES
2011 Yukon-DES
2012 Destiny-DES
2012 Achilles-DES
2012 Werner-DES
2014 Siablis-IDEAS-DES
2016 PES-BTK-70-Stentys DES
2009 Ferraresi-UB
2011 Leipzig Registry-UB
2012 Iida-UB
2013 Liistro-DCBate-BTK UB
2014 InPact Deep Trial-UB
2015 Biolux P-II UB
2016 Nanocross Study UB
2011 Leipzig-InPact Registry DCB
2013 Liistro-DCBate-BTK DCB
2014 Siablis-IDEAS-DCB
2014 InPact Deep Trial DCB
2015 Biolux P-II DCB
2016 Micari-Lutonix DCB
2016 Steinert-Lutonix DCB
Published studies on BTK angioplasty


Mean legth of the treated lesion
10 studies on BE-BMS
Mean lesion length 27.5 mm (14-52)
mm
250
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
2011 Yukon-BMS
2012 Destiny-BMS
2007 Kickuth-Xpert
2009 Bosiers-Xpert
2009 Donas-Xpert
2012 Xcell-Xpert
2015 Expand-Pulsar
2005 Siablis-DES
2006 Scheinert-DES
2007 Siablis-DES
2008 Rosales-DES
2009 Falkowski-DES
2010 Below-DES
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2011 Rastan-DES
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2011 Yukon-DES
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2011 Leipzig-InPact Registry DCB
2013 Liistro-DCBate-BTK DCB
2014 Siablis-IDEAS-DCB
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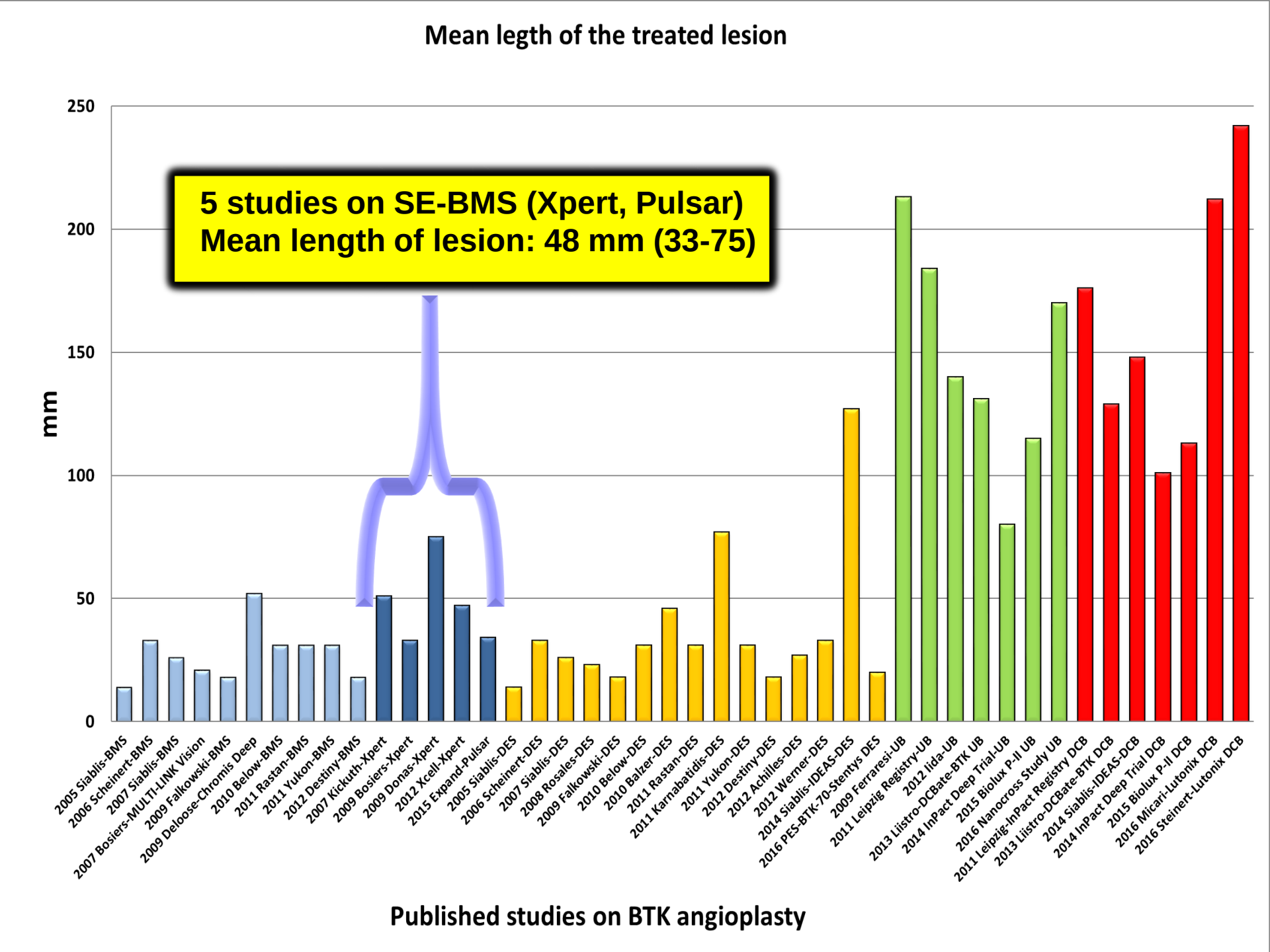
2016 Micari-Lutonix DCB
2016 Steinert-Lutonix DCB
Published studies on BTK angioplasty


Mean legth of the treated lesion
5 studies on SE-BMS (Xpert, Pulsar)
Mean length of lesion: 48 mm (33-75)
mm
250
200
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
2011 Yukon-BMS
2012 Destiny-BMS
2007 Kickuth-Xpert
2009 Bosiers-Xpert
2009 Donas-Xpert
2012 Xcell-Xpert
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2010 Below-DES
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2012 Iida-UB
2013 Liistro-DCBate-BTK UB
2014 InPact Deep Trial-UB
2015 Biolux P-II UB
2016 Nanocross Study UB
2011 Leipzig-InPact Registry DCB
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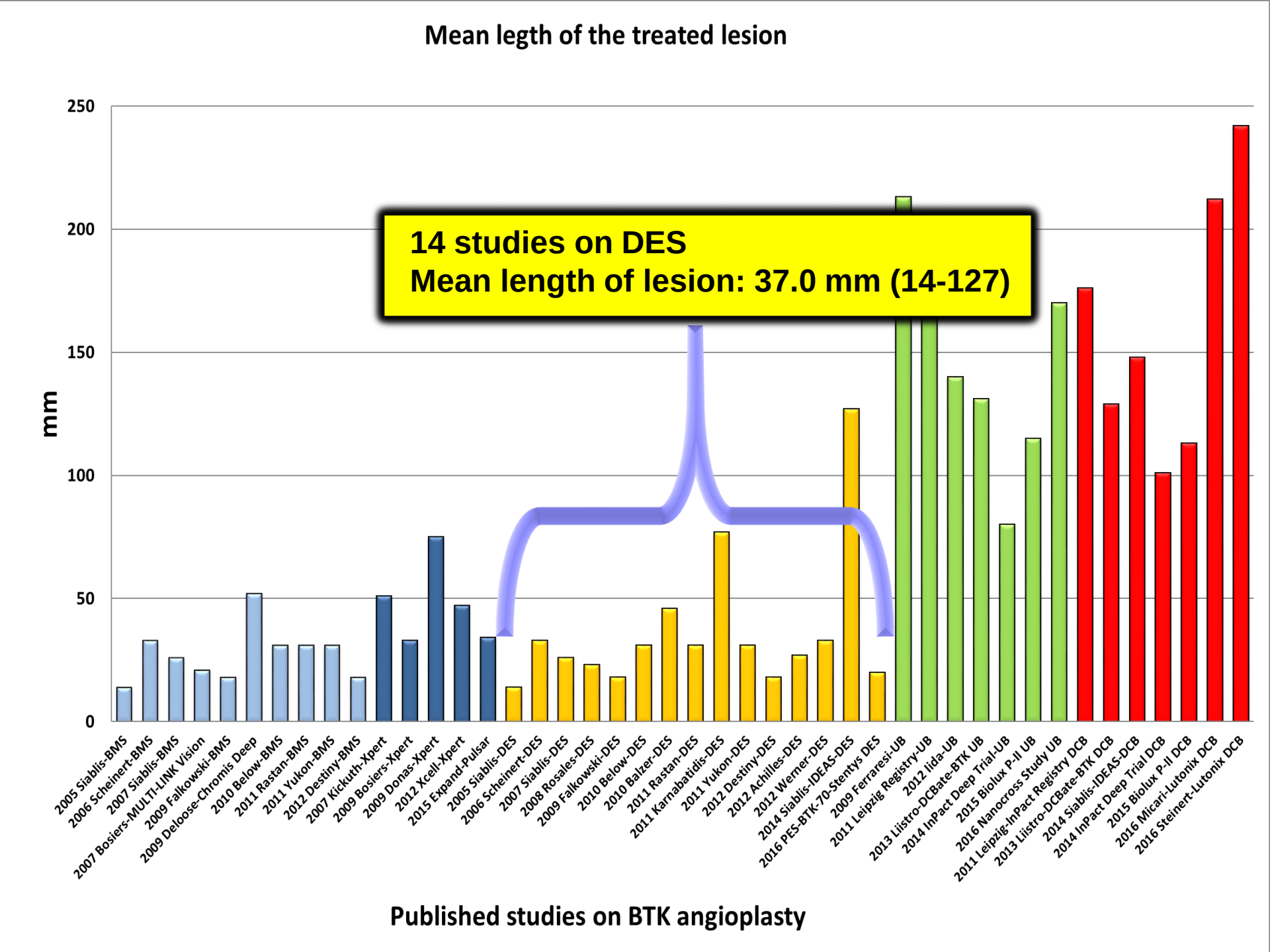
2016 Steinert-Lutonix DCB
Published studies on BTK angioplasty


Mean legth of the treated lesion
14 studies on DES
Mean length of lesion: 37.0 mm (14-127)
mm
250
200
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
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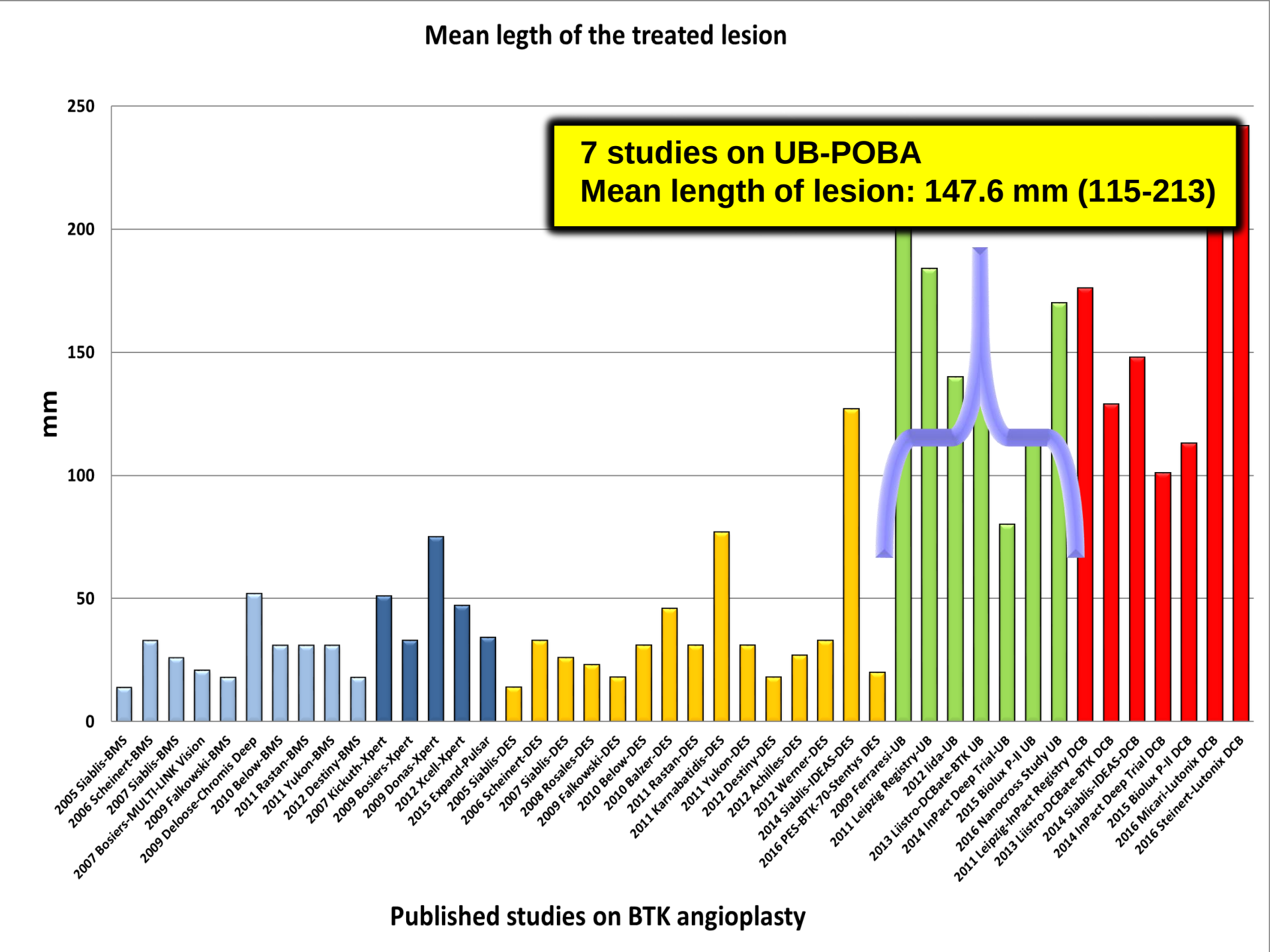
Published studies on BTK angioplasty


Mean legth of the treated lesion
7 studies on UB-POBA
Mean length of lesion: 147.6 mm (115-213)
mm
250
200
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
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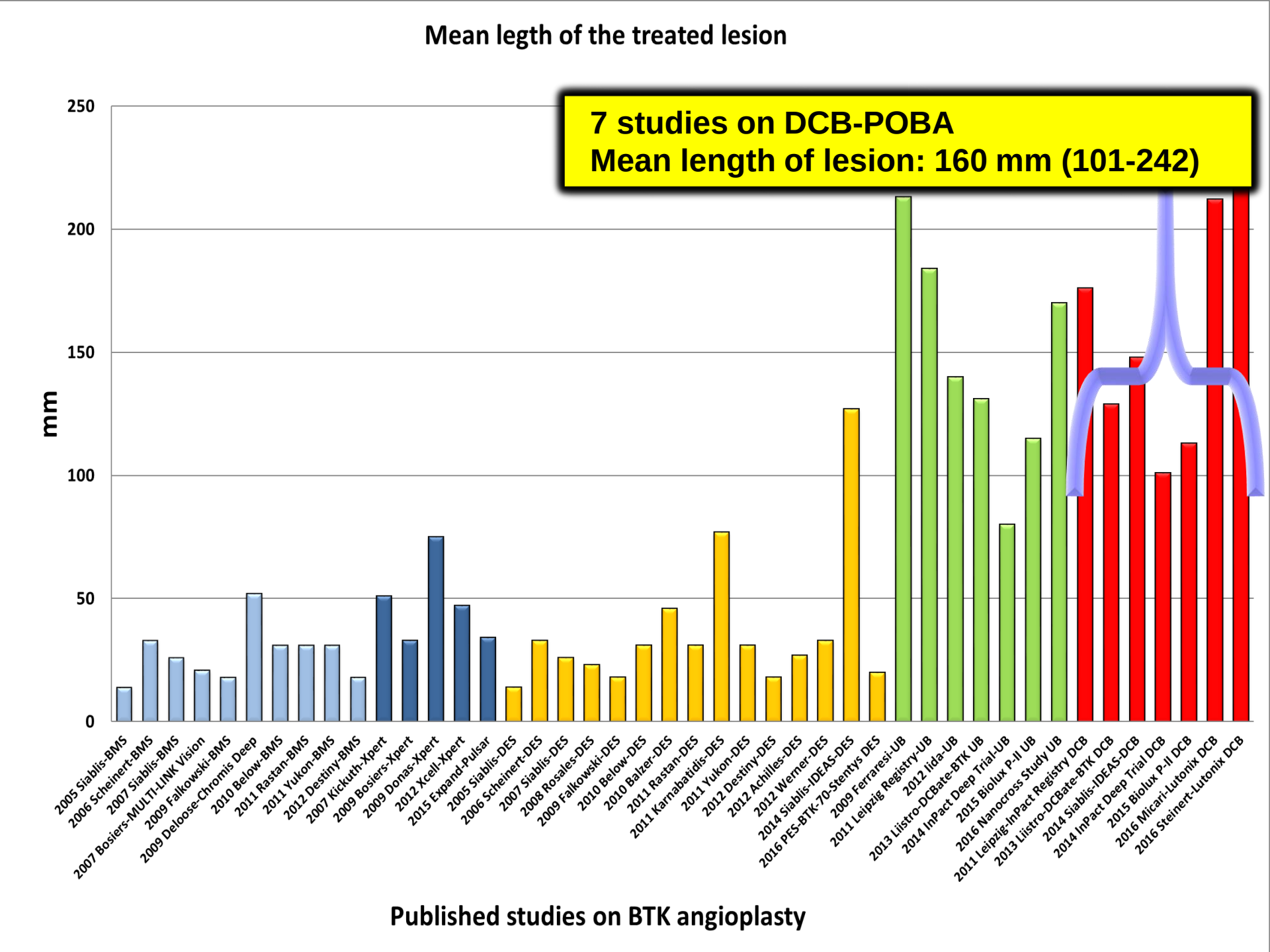
2016 Steinert-Lutonix DCB
Published studies on BTK angioplasty


Mean legth of the treated lesion
7 studies on DCB-POBA
Mean length of lesion: 160 mm (101-242)
mm
250
200
150
100
50
0
2005 Siablis-BMS
2006 Scheinert-BMS
2007 Siablis-BMS
2007 Bosiers-MULTI-LINK Vision
2009 Falkowski-BMS
2009 Deloose-Chromis Deep
2010 Below-BMS
2011 Rastan-BMS
2011 Yukon-BMS
2012 Destiny-BMS
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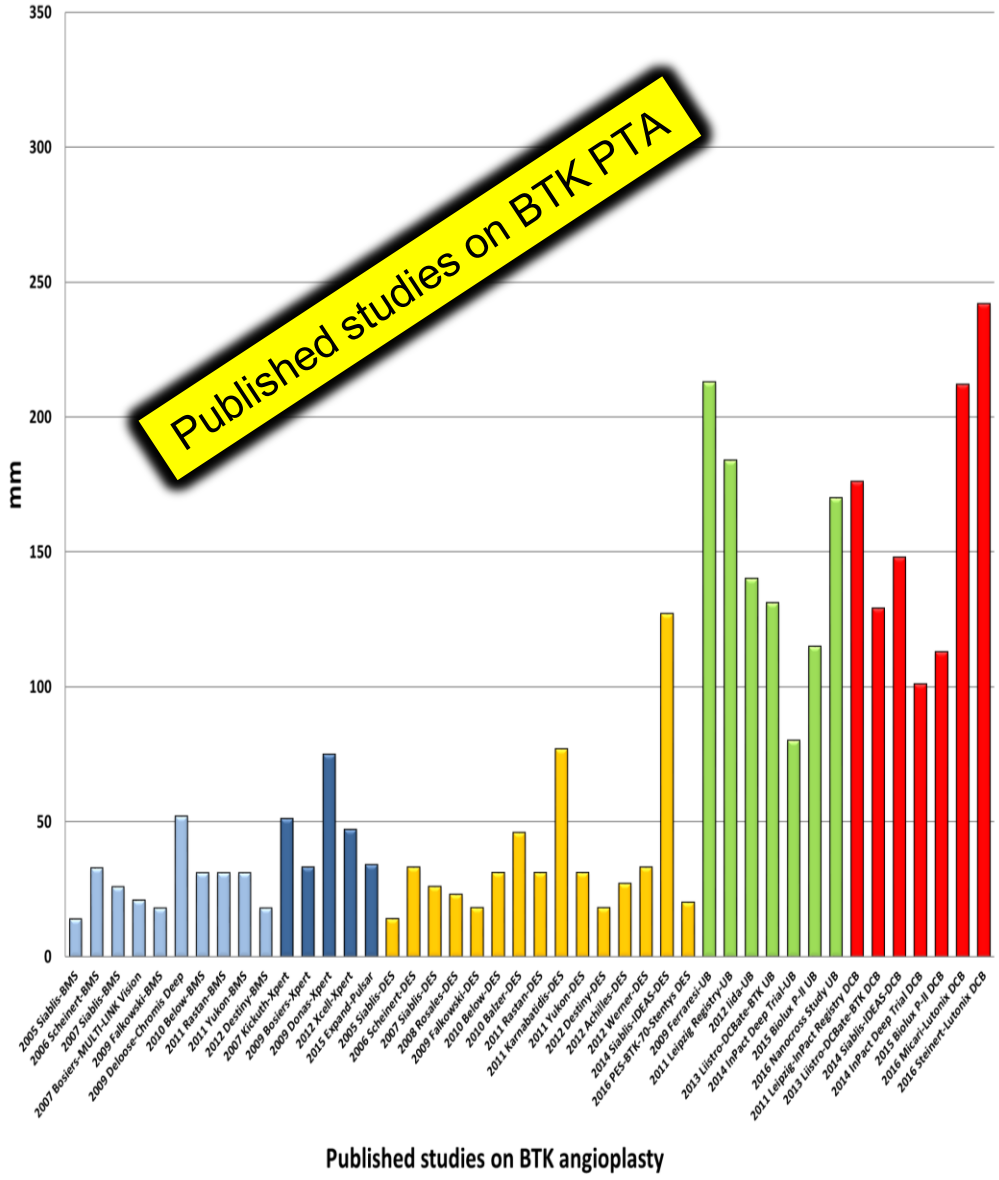
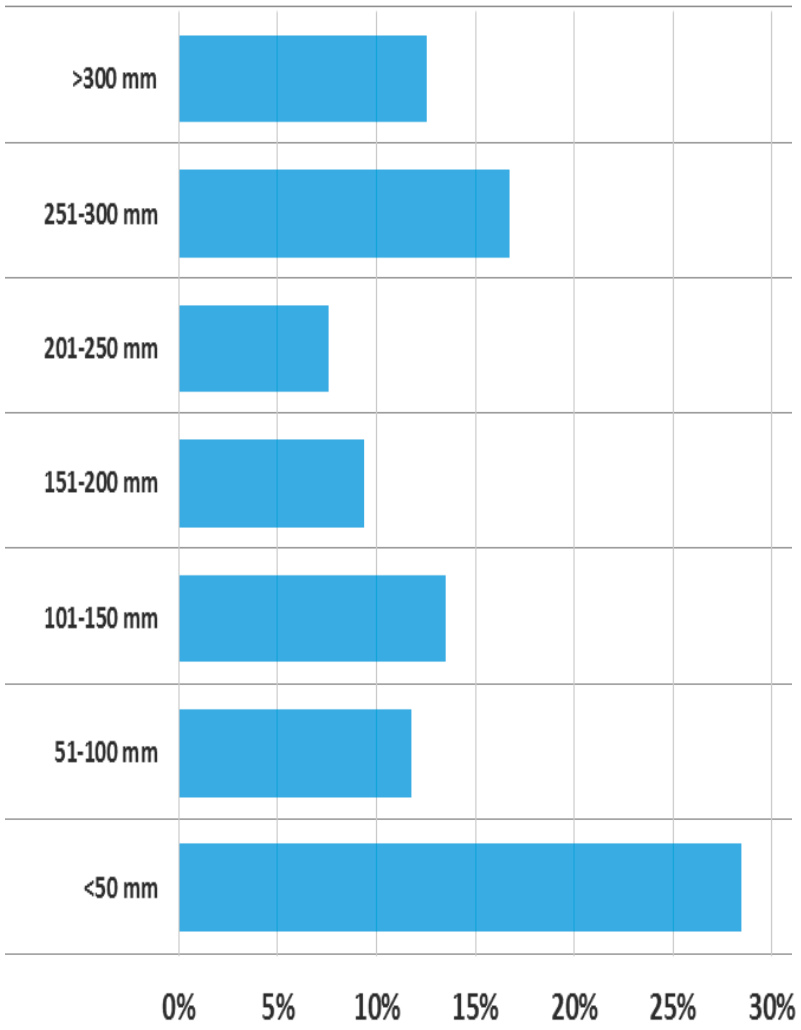
Published studies on BTK angioplasty

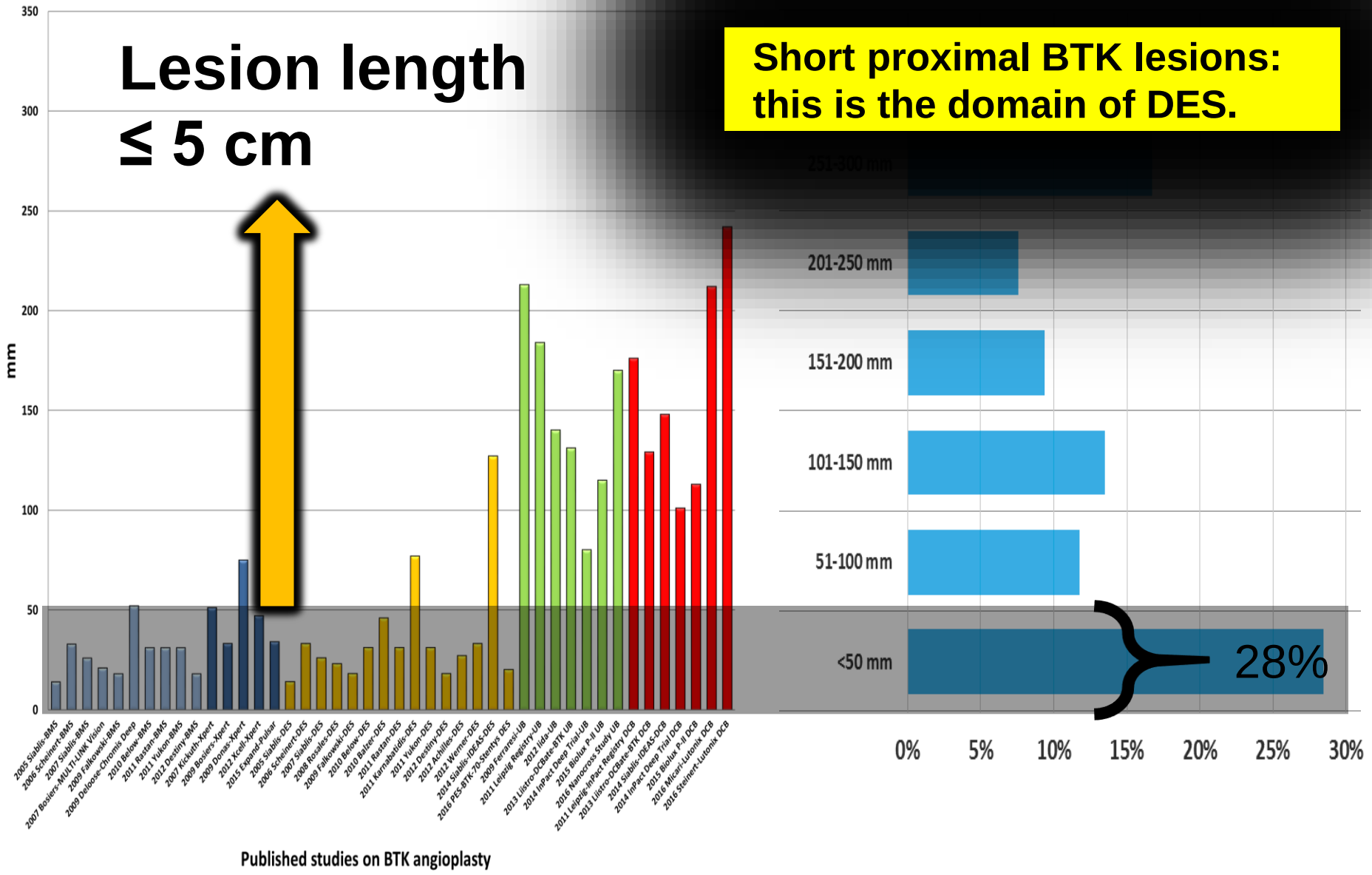
Length of the BTK successfully treated lesion



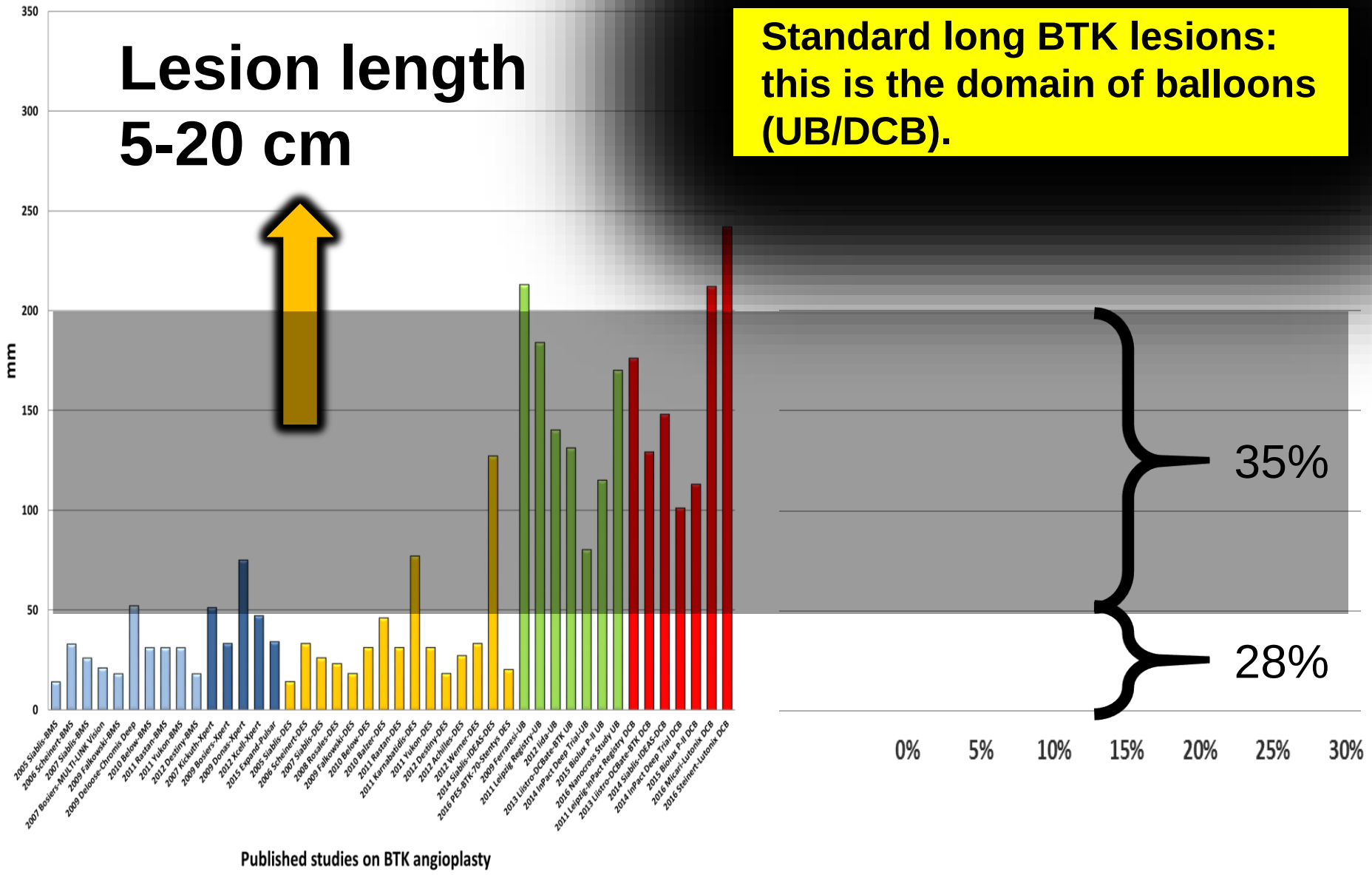


3683 successfully treated lesions in BTK vessels

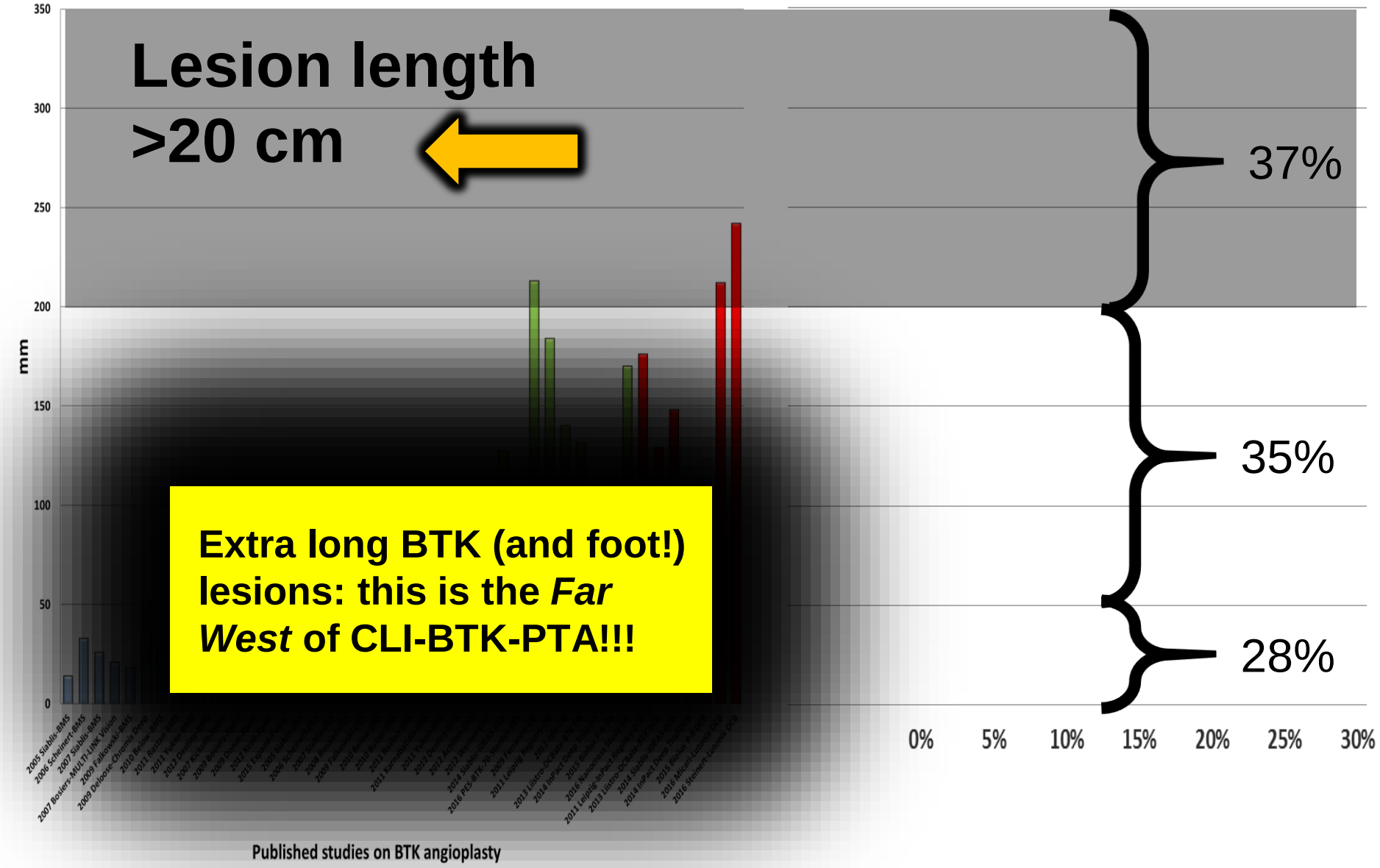
Length of the BTK successfully treated lesion



Length of the BTK successfully treated lesion



Length of the BTK successfully treated lesion



Inflation with or without drugs BTK?

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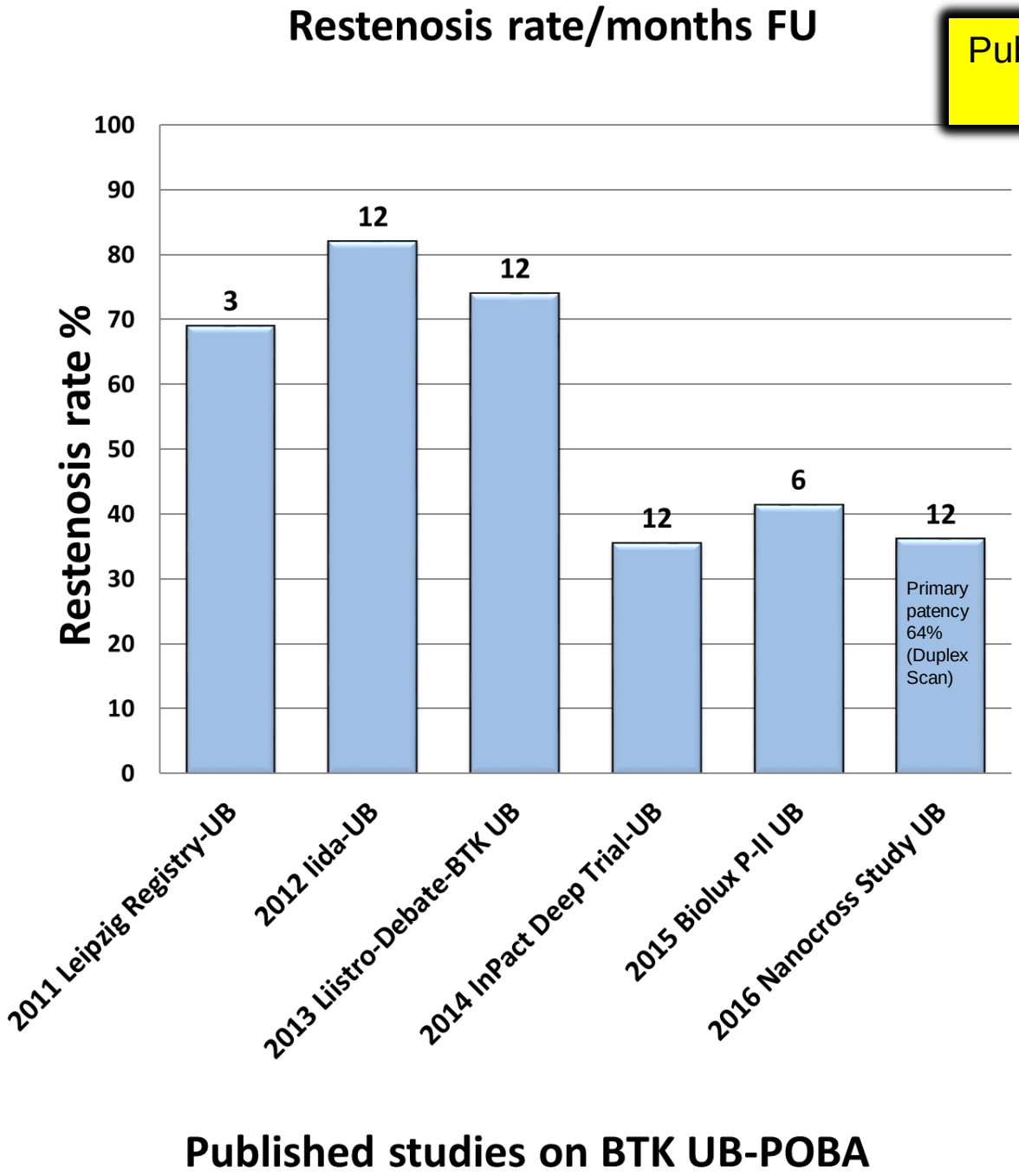
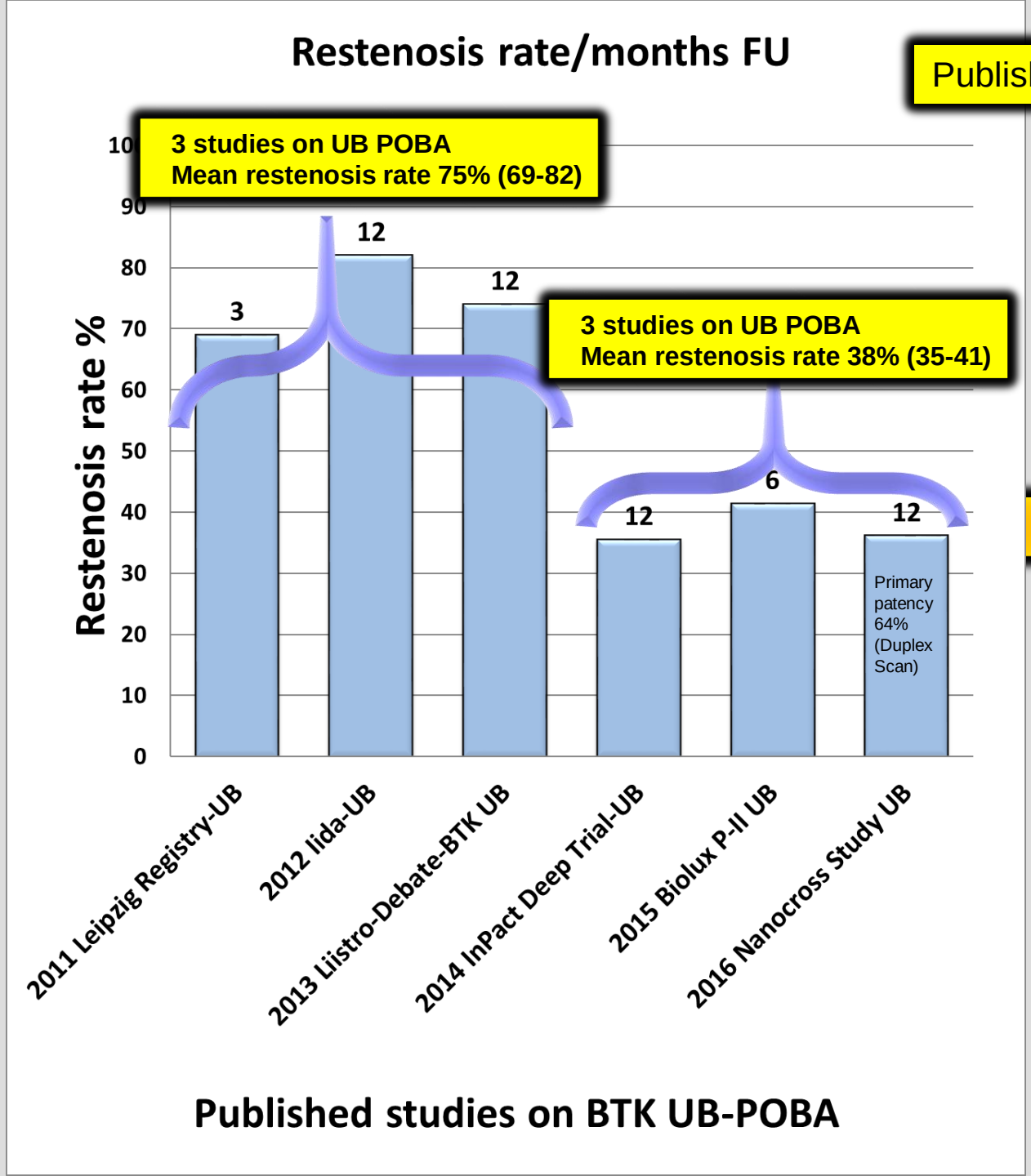
2. **UB POBA published data**
3. **DCB POBA published data**
4. **Conclusion**



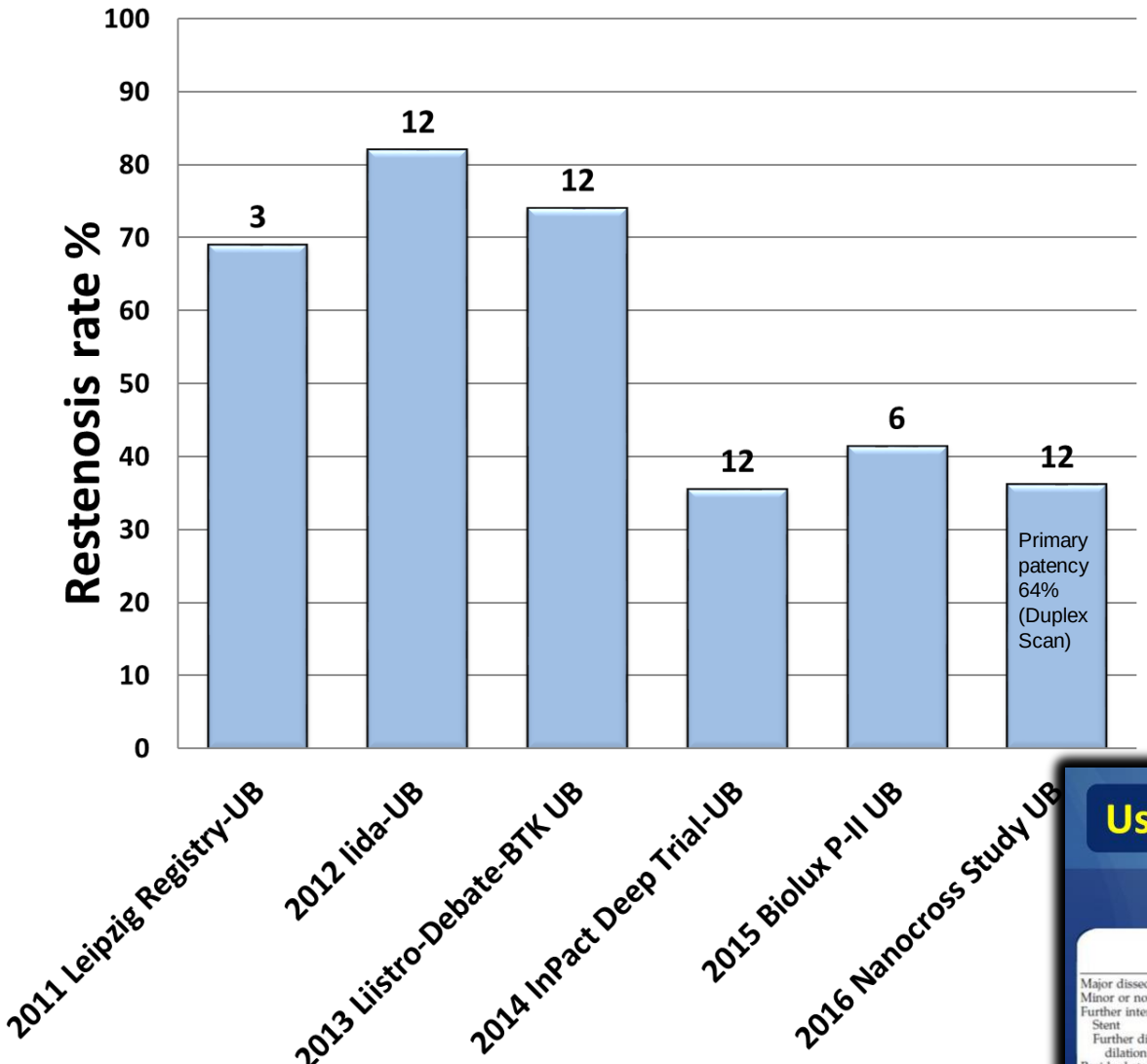
Published studies on BTK UB-POBA reporting restenosis rate



Published studies on BTK UB-POBA

No agreement on restenosis rate of UB! Why?

Restenosis rate/months FU



Published studies on BTK UB-POBA

Published studies on BTK UB-POBA

Use the correct inflation time!

	Inflation Time (sec)		
	30	180	*P* Value
Major dissection (grades 3 and 4)	16	5	.010
Minor or no dissection (grades 1 and 2)	21	32	.010
Further interventions	20	9	.017
Stent	4	1	
Further dilation (prolonged dilation, dilation with larger diameter)	16	8	
Residual stenosis (>30%)	12	5	.097
Complication (embolization, thrombosis)	1	1	
Mean ankle-brachial index (before, after intervention)	0.66, 0.87	0.65, 0.84	

Prolonged inflation (180 sec) improves the immediate result of BTK angioplasty compared to short dilatation times (30 sec)

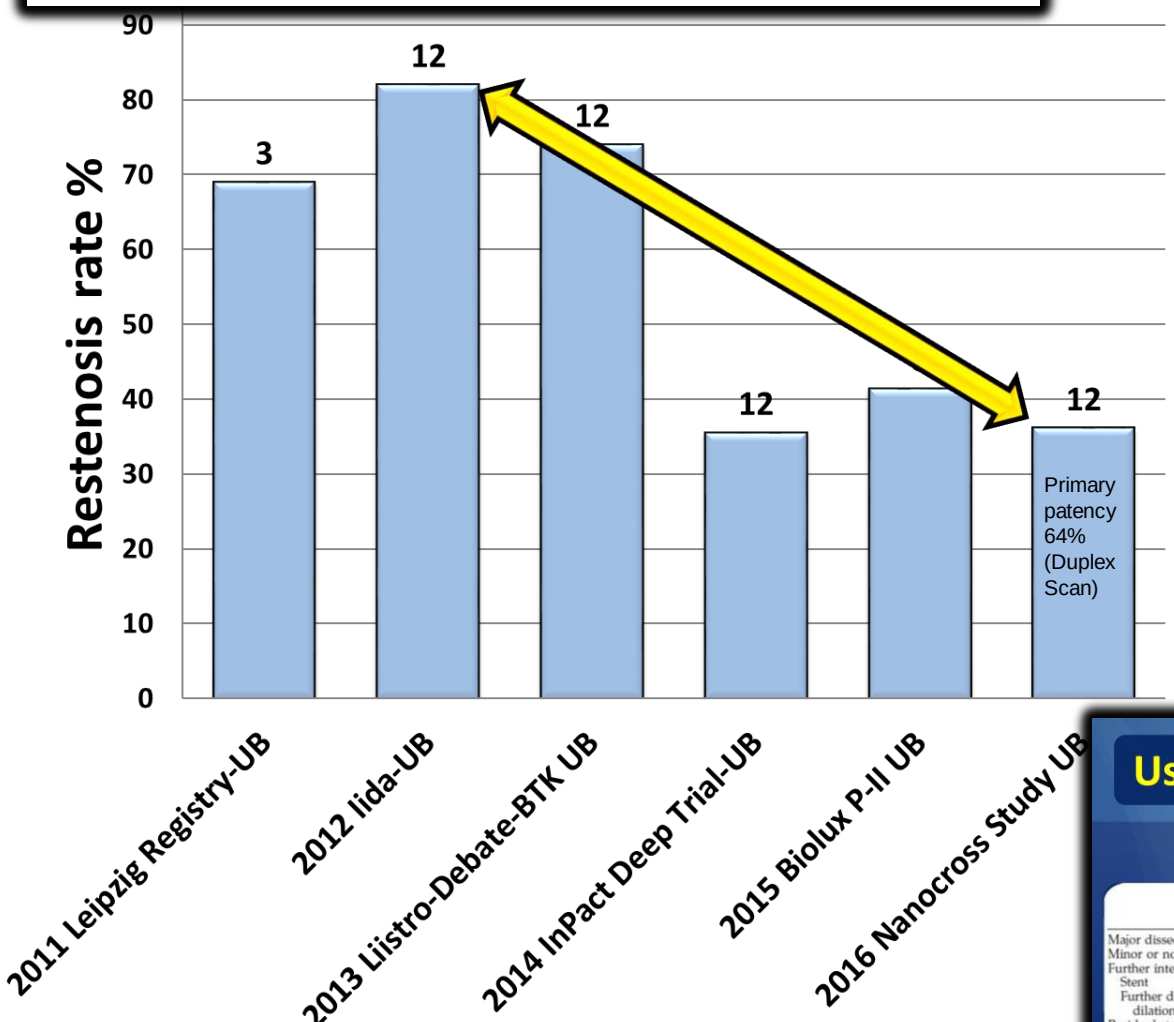
Significantly fewer major dissections and a modest reduction of residual stenoses are observed

Zorger et al. 2002. *J Vasc Interv Radiol*

Restenosis rate/months FU

Published studies on BTK UB-POBA

held at nominal pressure for at least 180 s.



No inflation time difference

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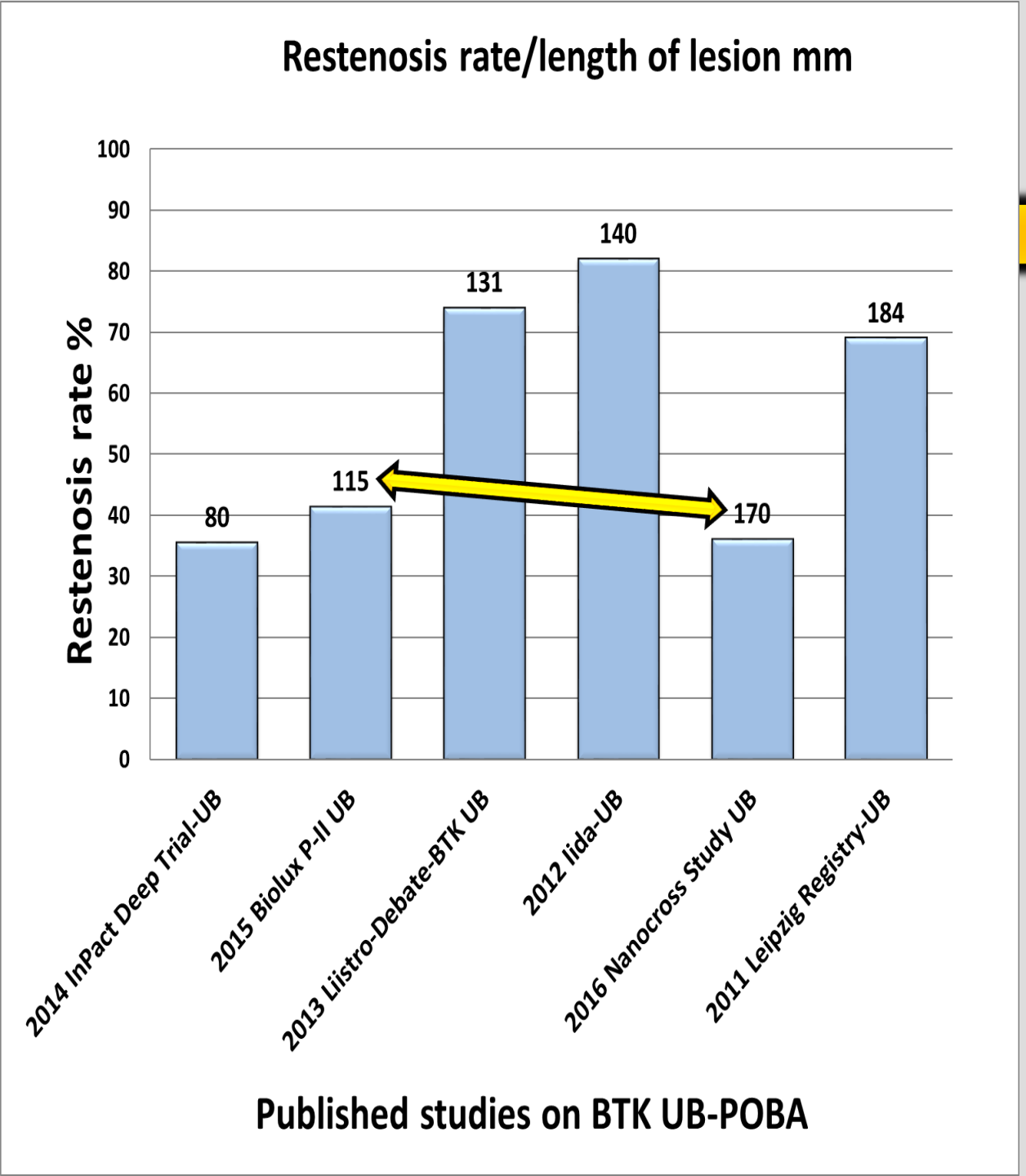
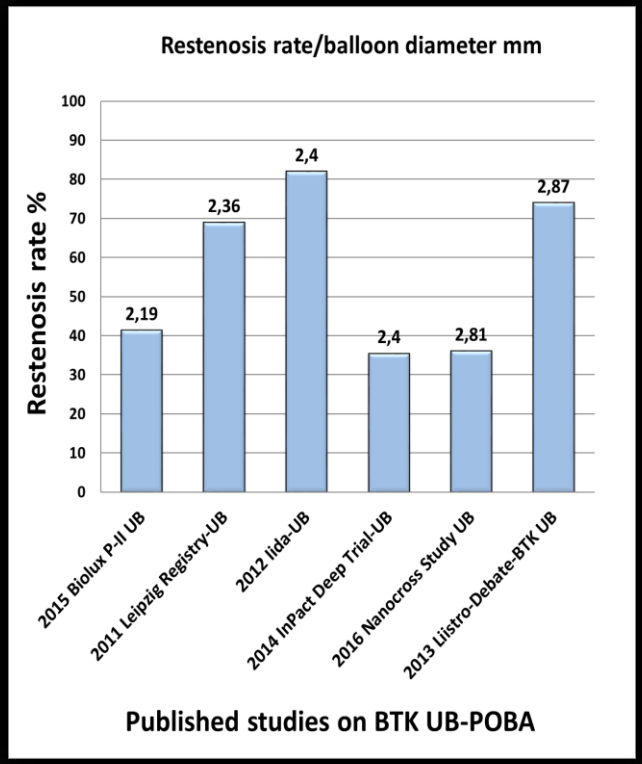
Published studies on BTK UB-POBA



No lesion length difference



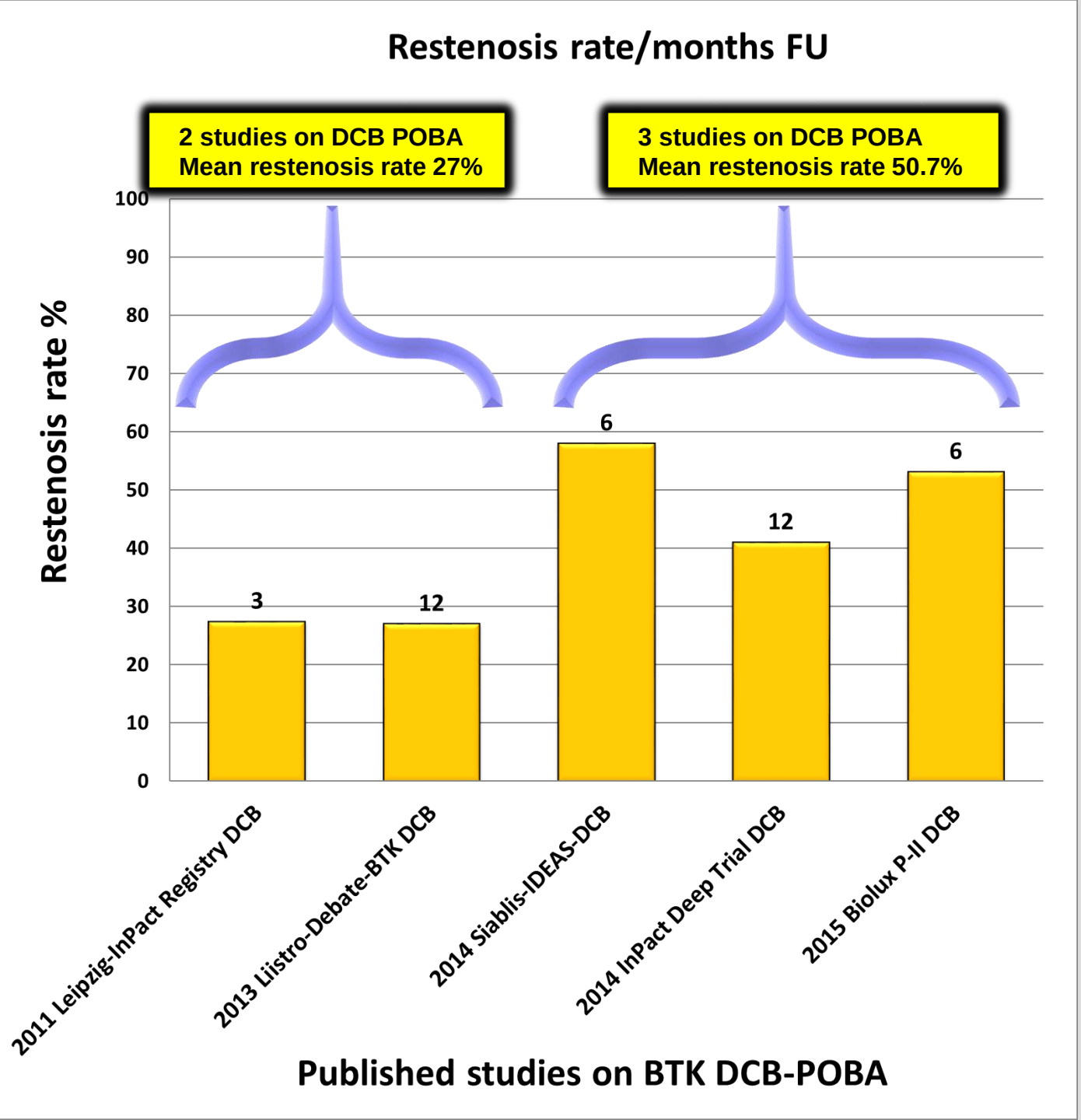
Data on UB-POBA are conflicting!

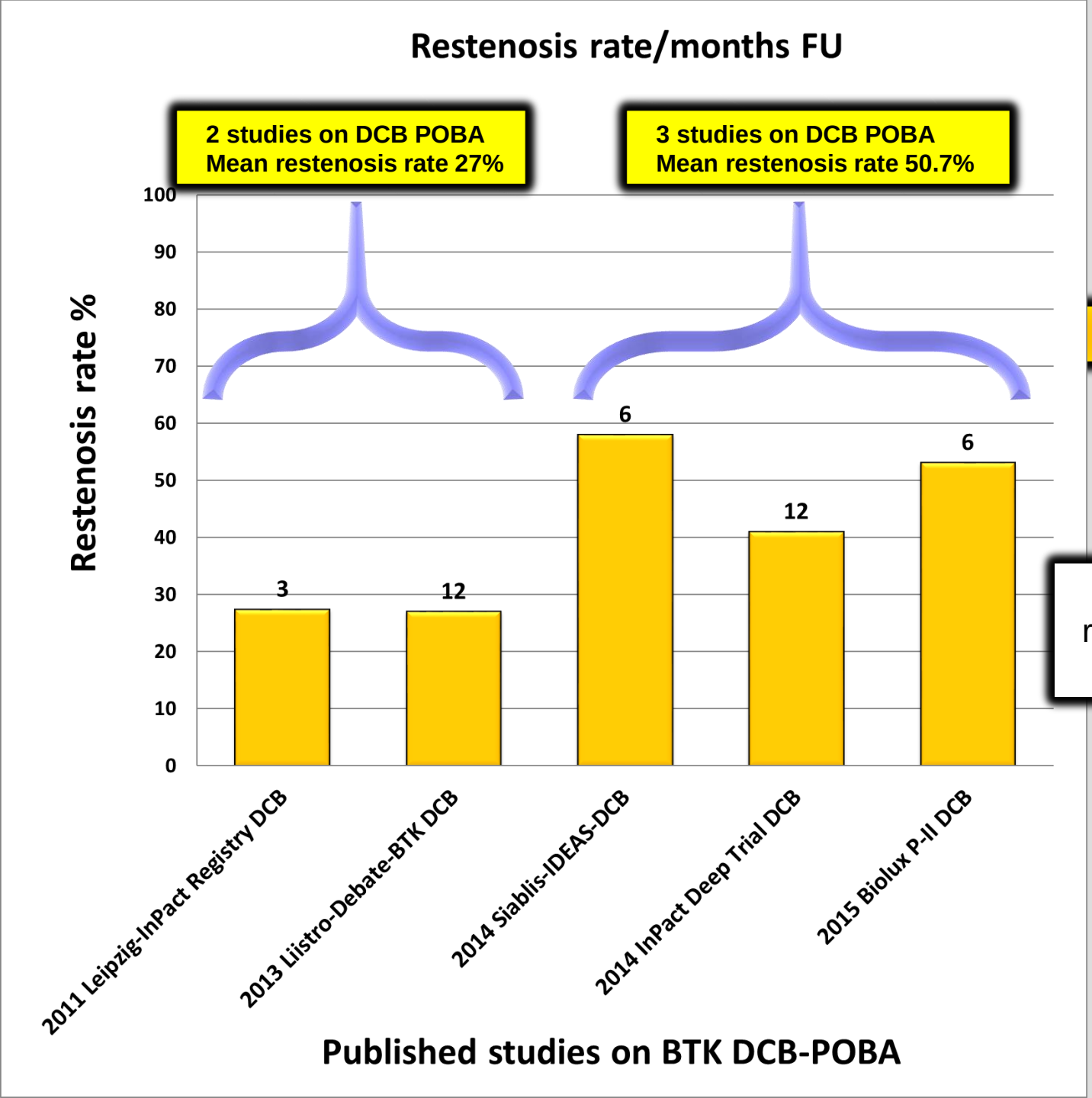
"…Before running ahead with new devices we should learn when and how to use in BTK the oldest one, the UB"

(Ferraresi, Vascular News 2016)

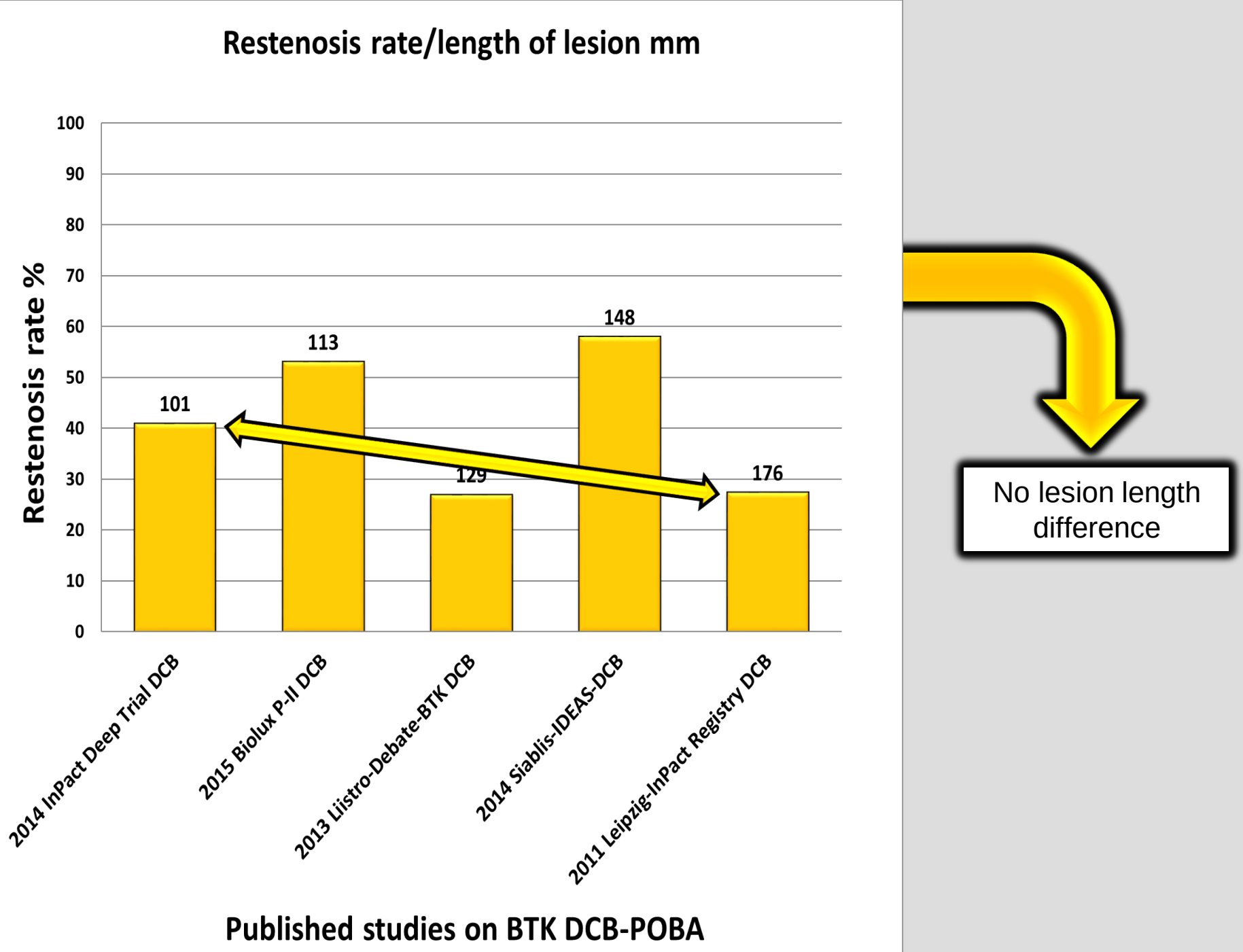
Inflation with or without drugs BTK?

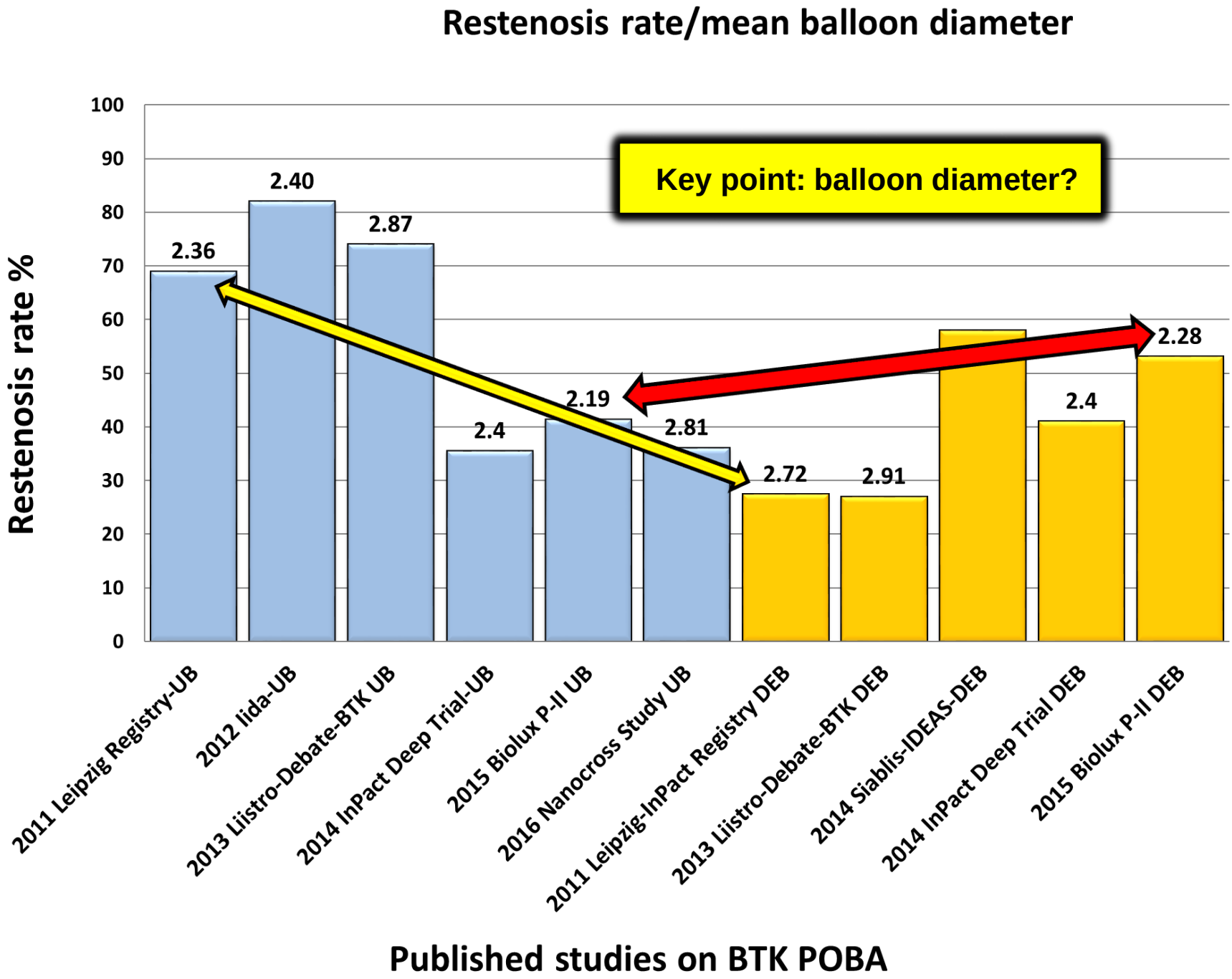
1. **The scenario of BTK angioplasty**
2. **UB POBA published data**
3. **DCB POBA published data**
4. **Conclusion**


Restenosis rate/months FU
2 studies on DCB POBA
Mean restenosis rate 27%
3 studies on DCB POBA
Mean restenosis rate 50.7%
Restenosis rate %
100
90
80
70
60
50
40
30
20
10
0
3
12
6
12
6
2011 Leipzig-InPact Registry DCB
2013 Liistro-Debate-BTK DCB
2014 Siablis-IDEAS-DCB
2014 InPact Deep Trial DCB
2015 Biolux P-II DCB
Published studies on BTK DCB-POBA



No agreement on restenosis rate of DCB! Why?


Restenosis rate/length of lesion mm
Restenosis rate %
100
90
80
70
60
50
40
30
20
10
0
101
113
129
148
176
2014 InPact Deep Trial DCB
2015 Biolux P-II DCB
2013 Liistro-Debate-BTK DCB
2014 Siablis-IDEAS-DCB
2011 Leipzig-InPact Registry DCB
Published studies on BTK DCB-POBA
No lesion length difference


Restenosis rate/mean balloon diameter
Key point: balloon diameter?
Restenosis rate %
100
90
80
70
60
50
40
30
20
10
0
2.36
2.40
2.87
2.4
2.19
2.81
2.72
2.91
2.28
2.4
2011 Leipzig Registry-UB
2012 Iida-UB
2013 Liistro-Debate-BTK UB
2014 InPact Deep Trial-UB
2015 Biolux P-II UB
2016 Nanocross Study UB
2011 Leipzig-InPact Registry DEB
2013 Liistro-Debate-BTK DEB
2014 Siablis-IDEAS-DEB
2014 InPact Deep Trial DEB
2015 Biolux P-II DEB
Published studies on BTK POBA

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Drug-Coated Balloons for Revascularization of Infrapopliteal Arteries

A Meta-Analysis of Randomized Trials

Salvatore Cassese, MD, PhD,[a] Gjin Ndrepepa, MD,[a] Francesco Liistro, MD,[b] Fabrizio Fanelli, MD,[c] Sebastian Kufner, MD,[a] Ilka Ott, MD,[a] Karl-Ludwig Laugwitz, MD,[d,e] Heribert Schunkert, MD,[a,e] Adnan Kastrati, MD,[a,e] Massimiliano Fusaro, MD[a]

TABLE 1 Main Characteristics of Patients Enrolled Among Trials Included in the Study

Trial (Ref. #)	Patients, n	Age, yrs	Men, %	Diabetes, %	CKD, %	CLI, %	Lesion Length, mm	Diameter Stenosis, %	Severe Calcification, %	Occlusion, %
BIOLUX PII (9)	72	71.3	79	67	28	78	114.1	72.3	5	NR
DEBATE BTK (6)	132	74.5	80	100	11	100	130.0	97.2	27	80
DEBELLUM* (7)	30	66.5	73	52	NR	52	77.0	86.5	18	21
IDEAS (8)	50	71.5	76	70	54	100	137.5	86.0	47	17
IN.PACT DEEP (10)	358	72.5	73	72	11	100	115.0	85.2	21	42

Overall mean values are reported. *Patients presenting with infrapopliteal lesions only.

BIOLUX PII = First-in-Man Study to Compare the Passeo-18 Lux DRB Against POBA in Infrapopliteal Arteries; CKD = chronic kidney disease; CLI = critical limb ischemia; DEBATE BTK = Drug Eluting Balloon in Peripheral Intervention for Below the Knee Angioplasty Evaluation; DEBELLUM = Drug-Eluting Balloon Evaluation for Lower Limb Multilevel Treatment Drug Eluting Stents; IDEAS = Infrapopliteal Drug Eluting Angioplasty Versus Stenting for the Treatment of Long-Segment Arterial Disease; IN.PACT DEEP = IN.PACT Amphirion™ Drug Eluting Balloon vs. Standard PTA for the Treatment of Below the Knee Critical Limb Ischemia; NR = not reported.

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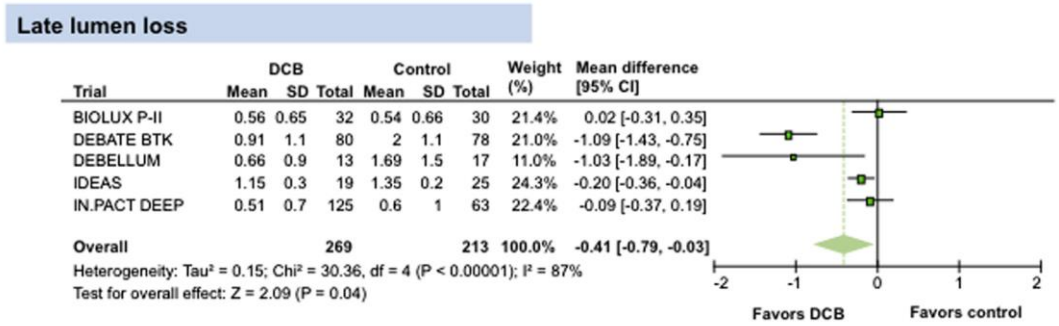
Salvatore Cassese, MD, PhD,[a] Gjin Ndrepepa, MD,[a] Francesco Liistro, MD,[b] Fabrizio Fanelli, MD,[c] Sebastian Kufner, MD,[a] Ilka Ott, MD,[a] Karl-Ludwig Laugwitz, MD,[d,e] Heribert Schunkert, MD,[a,e] Adnan Kastrati, MD,[a,e] Massimiliano Fusaro, MD[a]

FIGURE 6 Risk Estimates of Late Lumen Loss for Drug-Coated Balloon Versus Control Therapy



Plots of weighted mean difference for late lumen loss associated with drug-coated balloon (DCB) versus control therapy. The **diamond** indicates the point estimate, and the **left and right ends of the line** indicate the 95% confidence interval (CI). Trial acronyms are defined in Table 1.

CONCLUSIONS

The results of our meta-analysis suggest that in patients with infrapopliteal artery disease, percutaneous intervention with DCBs compared with uncoated balloons or DESs displays similar clinical efficacy and favorable angiographic outcomes at 1-year follow-up.

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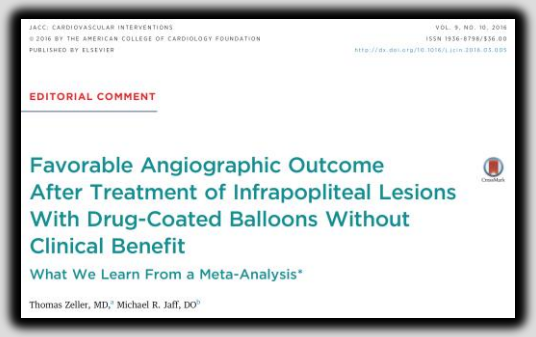
What We Learn From a Meta-Analysis*

Thomas Zeller, MD,[a] Michael R. Jaff, DO[b]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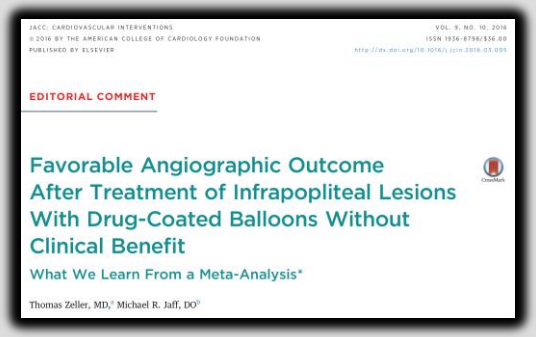
First of all, are the angiographic findings correct? Are DCB really superior in terms of LLL over UB and DES? Interestingly, only the **3 uncontrolled studies** using the IN.PACT Amphirion DCB resulted in superior LLL outcomes whereas **both independently core laboratory adjudicated and fully industry funded studies** found identical LLL outcomes for the DCB and UB cohorts suggesting a lack of biological efficacy of both DCB brands examined in those 2 studies.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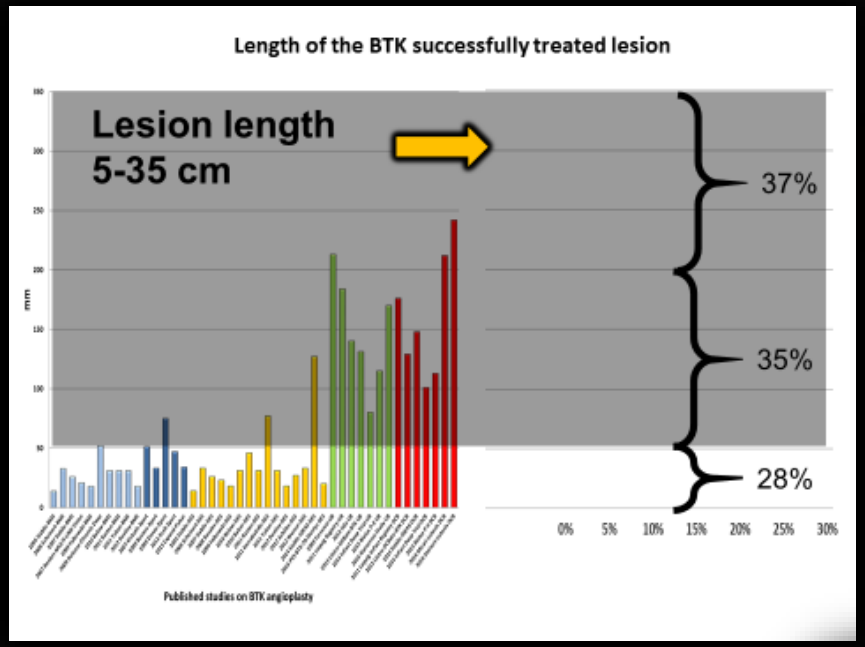
In summary, despite the superior angiographic outcome defined as LLL in this meta-analysis the performance of DCB in infrapopliteal lesions remains controversial.



I need something to treat the vast majority of BTK lesions (5-35 cm).

I believe in DCB on the basis of:

- **Personal experience**
- **Friends advise**

But today we have not any real scientific support to use DCB!