PEPCAD China ISR

A prospective, multicentre, randomised trial of paclitaxel-eluting balloon vs. paclitaxel-eluting stent for treatment of DES in-stent restenosis

9-month angiographic and 12-month clinical results

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ClinicalTrials.gov Identifier: NCT01622075

Potential conflicts of interest

Speaker's name: Run-Lin Gao

☑ **I have the following potential conflicts of interest to report:**

Institutional grant/research support: Abbott Vascular, B Braun, Boston Scientific, and MicroPort

Restenosis after PCI - Achilles heel

Background and objective

- **The treatment of drug-eluting stent restenosis is still challenging with no established best strategy.**
- **ISAR-DESIRE 3 revealed that paclitaxel-eluting balloon (PEB) could be a useful treatment for patients with restenosis after implantation of a limus-eluting stent. The result need to be supported by other clinical trials; moreover, there is no study reported for PEB to treat in-stent restenosis in Chinese population so far.**

Objective

To evaluate the safety and efficacy of paclitaxel-eluting balloon (SeQuent Please, B Braun) versus paclitaxel-eluting stent (TAXUS Liberte, Boston Scientific) for treatment of DES restenosis

Inclusion and exclusion criteria

Major inclusion criteria

- Age 18-80 years old
- DES restenosis, Mehran type I-VI
- Reference vessel diameter 2.5-4.0mm, lesion length ≤30mm
- Diameter stenosis ≥70% or ≥50% with documented myocardial ischemia

Major exclusion criteria

- Acute myocardial infarction within 1 week
- Bifurcation with side branch diameter ≥2.5mm
- Evidence of extensive thrombus in target vessel
- Severe chronic heart failure or NYHA class IV
- Severe valvular heart disease
- Stroke within 6 months before the index procedure
- Severe renal failure (GFR<30ml/min)

Statistical assumption and endpoints

Primary endpoint

- **In-segment late lumen loss (LLL) at 9-month**

Secondary endpoints

- **Device and lesion success**
- **Diameter stenosis %, binary restenosis, and in-device late lumen loss at 9-month**
- **Target lesion failure (TLF), defined as the composite of cardiac death, target vessel myocardial infarction (TV-MI), or ischemia-driven target lesion revascularisation (iTLR) at 1, 6, 9, 12-month**
- **Definite/probable stent thrombosis**

Statistical assumption

- 1:1 randomisation
- One lesion would be treated per patient
- In-segment LLL would be 0.45±0.50mm in both group
- Non-inferiority margin of 0.22mm and two-sided type I error of 0.05
- Attrition rate 25%
- **220 patients (110 per group)** would yield >=80% power to detect non-inferiority

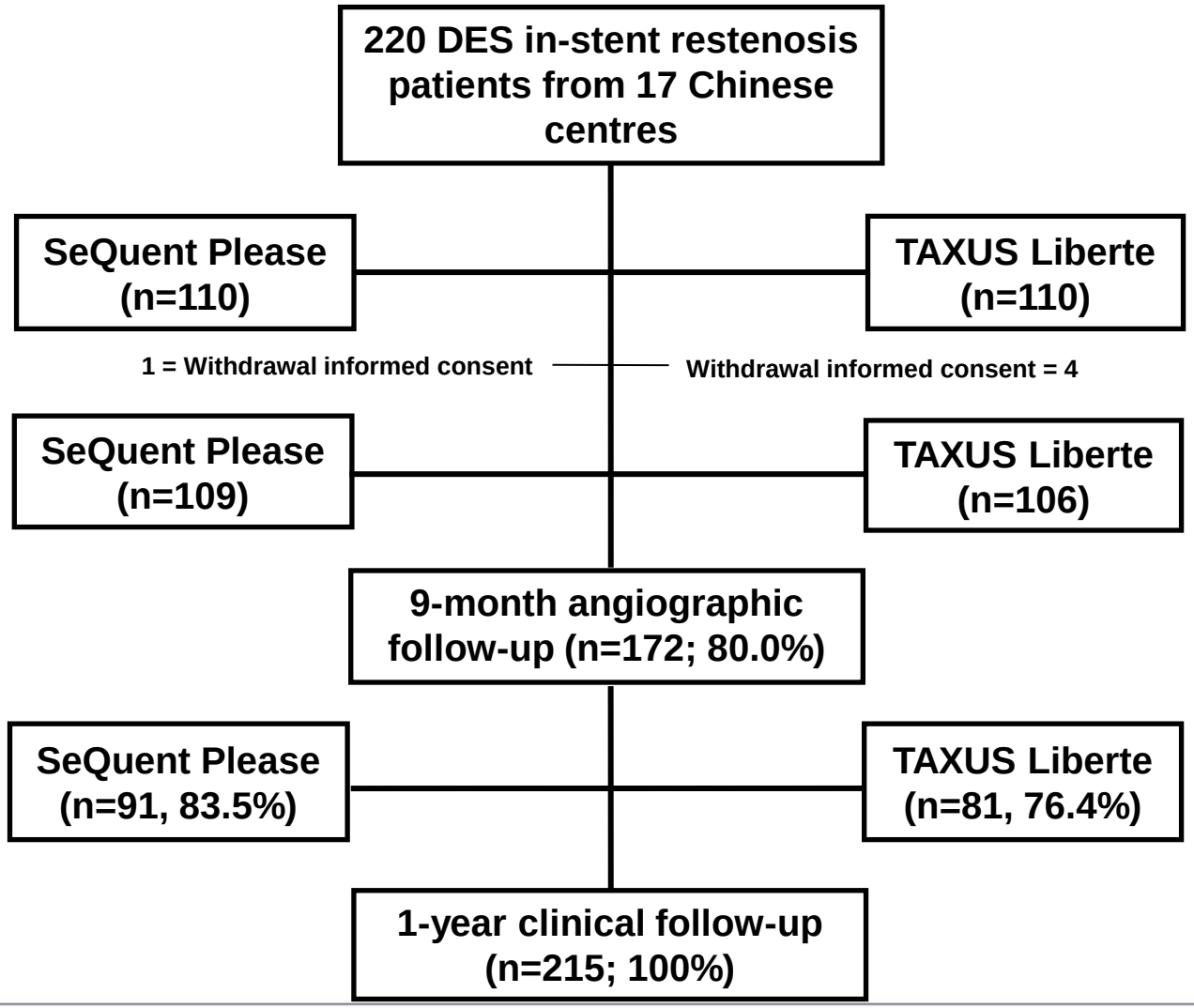
Study organisation

Participants	**17 Chinese centres**
Principle Investigator	**Run-Lin Gao**
Co-Principle Investigator	**Junbo Ge**
Executive committee	**Run-Lin Gao, Junbo Ge, Bo Xu**
Data monitoring and coordination	**CCRF**
Angiographic core Lab	**CCRF**
Clinical events committee	**Weimin Wang (Chair), Lefeng Wang, Yin Liu**
Data management and statistics	**Wei Li, Division of biometrics, National Centre for Cardiovascular Diseases of China**
Sponsor	**B Braun**

PEPCAD China ISR enrollers

Site Principle Investigators	Hospital, City	Number enrolled
Yuejin Yang	Fu Wai Hospital, National Centre for Cardiovascular Diseases of China, Beijing	54
Jian'an Wang	2nd Affiliated Hospital of Zhejiang University School of Medicine, Hangzhou	34
Shaoliang Chen	Affiliated Nanjing First Hospital of Nanjing Medical University, Nanjing	27
Bin Liu	Jilin University 2nd Hospital, Changchun	18
Fang Chen	Affiliated Anzhen Hospital of Capital Medical University, Beijing	15
Zhanquan Li	Liaoning Provincial People's Hospital, Shenyang	11
Yaling Han	Shenyang Northern Hospital, Shenyang	9
Guosheng Fu	Affiliated SRRS Hospital of Zhejiang University School of Medicine, Hangzhou	9
Junbo Ge	Affiliated Zhongshan Hospital of Fudan University, Shanghai	8
Ben He	Affiliated Renji Hospital of Shanghai Jiaotong University School of Medicine, Shanghai	8
Meng Wei	Shanghai 6th People's Hospital, Shanghai	8
Yundai Chen	Chinese PLA General Hospital, Beijing	7
Haichang Wang	Affiliated Xijing Hospital of the 4th Military Medical University, Xi'an	5
Jiyan Chen	Guangdong Provincial People's Hospital, Guangzhou	3
Ye Tian	1st Affiliated Hospital of Harbin Medical University, Harbin	2
Feng Xu	Beijing Hospital, Beijing	1
Xuezhong Zhao	Jilin University 1st Hospital, Changchun	1

Patient flow



Baseline demographics

	SeQuent Please, n=109	TAXUS Liberte, n=106	*P-value*
Age, years	61.8 ± 9.3	62.1 ± 9.3	0.8254
Male, % (n)	80.7 (88)	81.1 (86)	0.9408
Hypertension, % (n)	71.6 (78)	65.1 (69)	0.3079
Hyperlipidemia, % (n)	34.9 (38)	33.0 (35)	0.7753
Diabetes mellitus, % (n)	40.4 (44)	33.0 (35)	0.2635
Current smoker, % (n)	21.1 (23)	25.5 (27)	0.7319
Family history of CAD, % (n)	11.9 (13)	5.7 (6)	0.1061
Prior CABG, % (n)	2.8 (3)	0 (0)	0.2466
Prior MI, % (n)	48.6 (53)	34.9 (37)	0.0411
Unstable angina, % (n)	64.2 (70)	57.5 (61)	0.3159
LVEF, %	61.7 ± 8.5	62.3 ± 8.6	0.6556

Baseline lesion characteristics

	SeQuent Please, n=113	TAXUS Liberte, n=108	*P-value*
Target vessels			0.0764
LAD, % (n)	41.6 (47)	56.5 (61)	
LCX, % (n)	18.6 (21)	12.0 (13)	
RCA, % (n)	39.8 (45)	31.5 (34)	
Mehran classification, % (n)			0.1292
Type I - focal	68.1 (77)	58.3 (63)	
Type II - diffuse	18.6 (21)	20.4 (22)	
Type III - proliferative	13.3 (15)	17.6 (19)	
Type IV - occlusive	0 (0)	3.7 (4)	
Pre-procedure QCA			
RVD*, mm	2.66 ± 0.38	2.72 ± 0.44	0.3306
Lesion length, mm	12.5 ± 6.6	13.1 ± 7.1	0.5432
MLD**, mm	0.85 ± 0.38	0.86 ± 0.41	0.8557
Diameter stenosis, %	68.3 ± 12.5	68.4 ± 13.3	0.9245

*RVD = Reference vessel diameter; **MLD = Minimal lumen diameter

Procedural results

	SeQuent Please, n=113	TAXUS Liberte, n=108	*P-value*
Balloon predilatation, % (n)	99.1 (112)	99.1 (107)	1.0000
Study device, n	120	108	-
Diameter, mm	3.06 ± 0.39	2.98 ± 0.39	0.1286
Length, mm	19.7 ± 5.9	20.1 ± 7.1	0.6487
Inflation time, sec	44.5 ± 13.1	14.0 ± 10.8	<0.0001
Post-procedure QCA			
In-device MLD*, mm	2.39 ± 0.37	2.56 ± 0.44	0.0026
In-segment MLD*, mm	2.25 ± 0.38	2.32 ± 0.47	0.2115
In-device DS**, %	10.5 ± 7.2	7.1 ± 6.3	0.0002
In-segment DS**, %	12.9 ± 8.3	13.0 ± 8.8	0.9064
In-device acute gain, mm	1.54 ± 0.43	1.70 ± 0.47	0.0085
In-segment acute gain, mm	1.40 ± 0.44	1.47 ± 0.50	0.2868
Device success, % (n)	99.2 (119)	100 (108)	1.0000
Lesion success, % (n)	100 (113)	100 (108)	1.0000

*MLD = Minimal lumen diameter; **DS = Diameter stenosis

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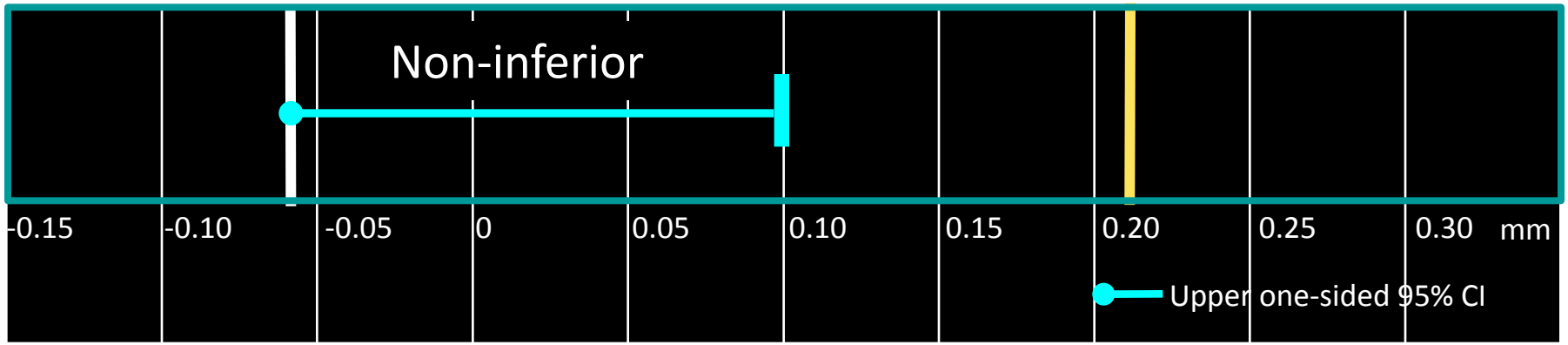
Primary endpoint: In-segment late lumen loss at 9-month

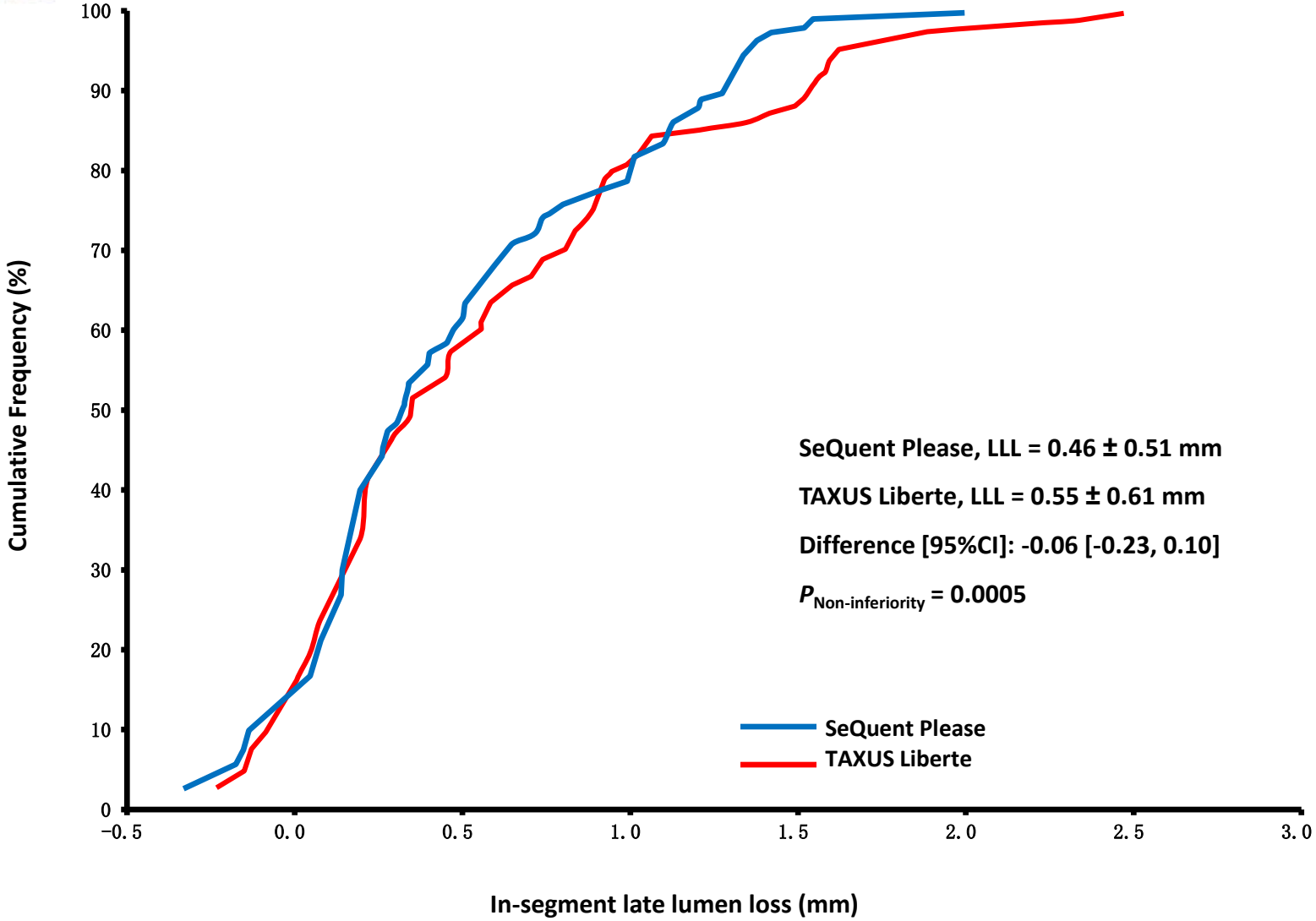
SeQuent® Please (n = 97) 0.46±0.51	TAXUS® Liberte (n = 84) 0.55±0.61	Difference : -0.06 mm Upper 2-sided 95% CI: 0.10 mm	Non-Inferiority *P* value 0.0005

Zone of non-inferiority
Pre-specified margin = 0.22mm



Primary Non-Inferiority Endpoint Met

Cumulative frequency of in-segment LLL

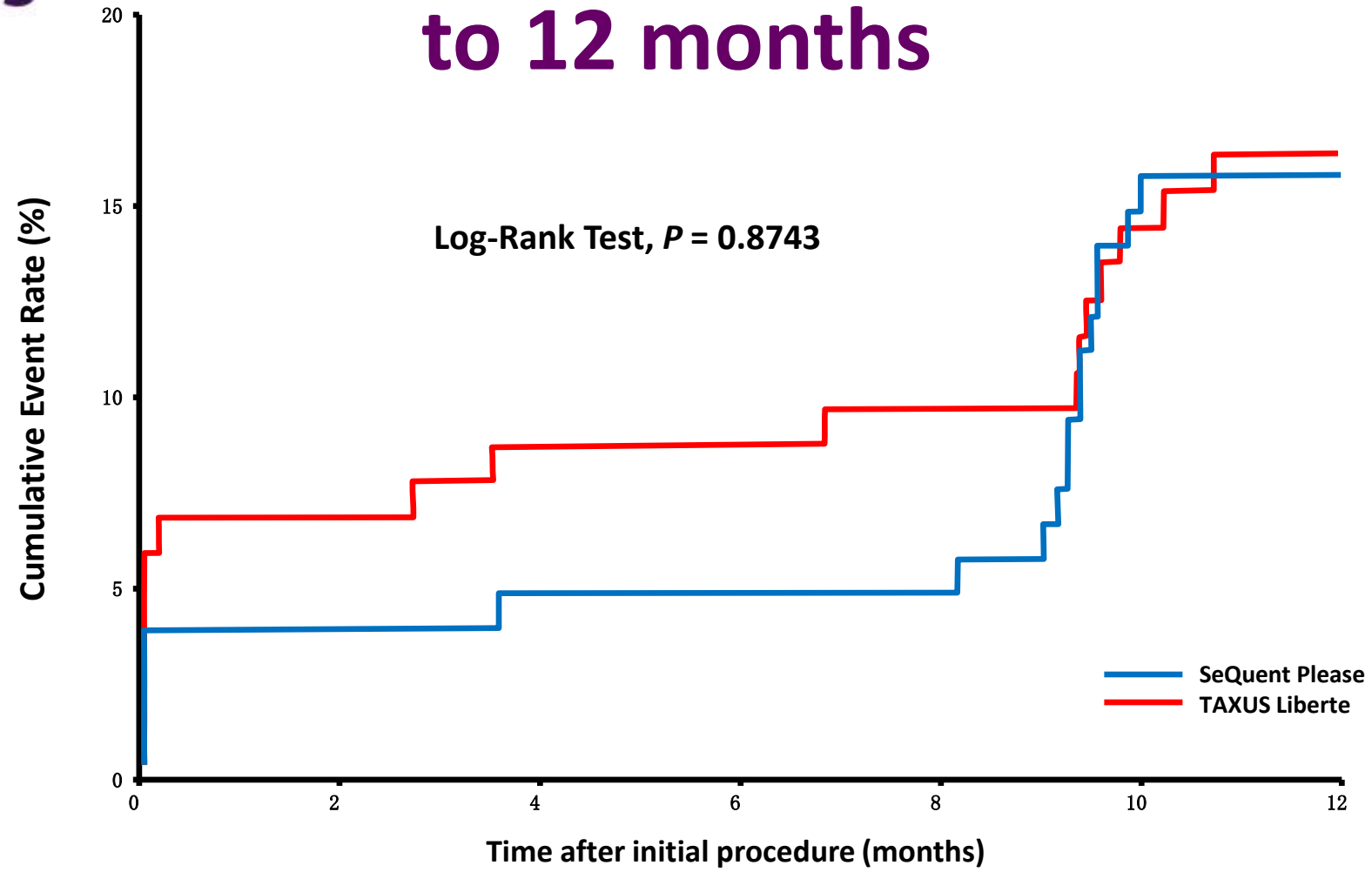


Angiographic results at 9-month

	SeQuent Please, n=91	TAXUS Liberte, n=81	*P-value*
Target lesion, n	97	84	-
RVD*, mm	2.59 ± 0.37	2.62 ± 0.45	0.6740
MLD**, mm			
In-device	1.85 ± 0.60	1.89 ± 0.75	0.6588
In-segment	1.80 ± 0.58	1.76 ± 0.71	0.6859
Diameter stenosis, %			
In-device	28.8 ± 20.9	27.7 ± 25.6	0.7633
In-segment	29.0 ± 21.3	30.8 ± 25.3	0.5913
Late lumen loss, mm			
In-device	0.54 ± 0.46	0.62 ± 0.68	0.3600
In-segment	0.46 ± 0.51	0.55 ± 0.61	0.3157
Binary restenosis, % (n)			
In-device	17.5 (17)	21.4 (18)	0.5078
In-segment	18.6 (18)	23.8 (20)	0.3874

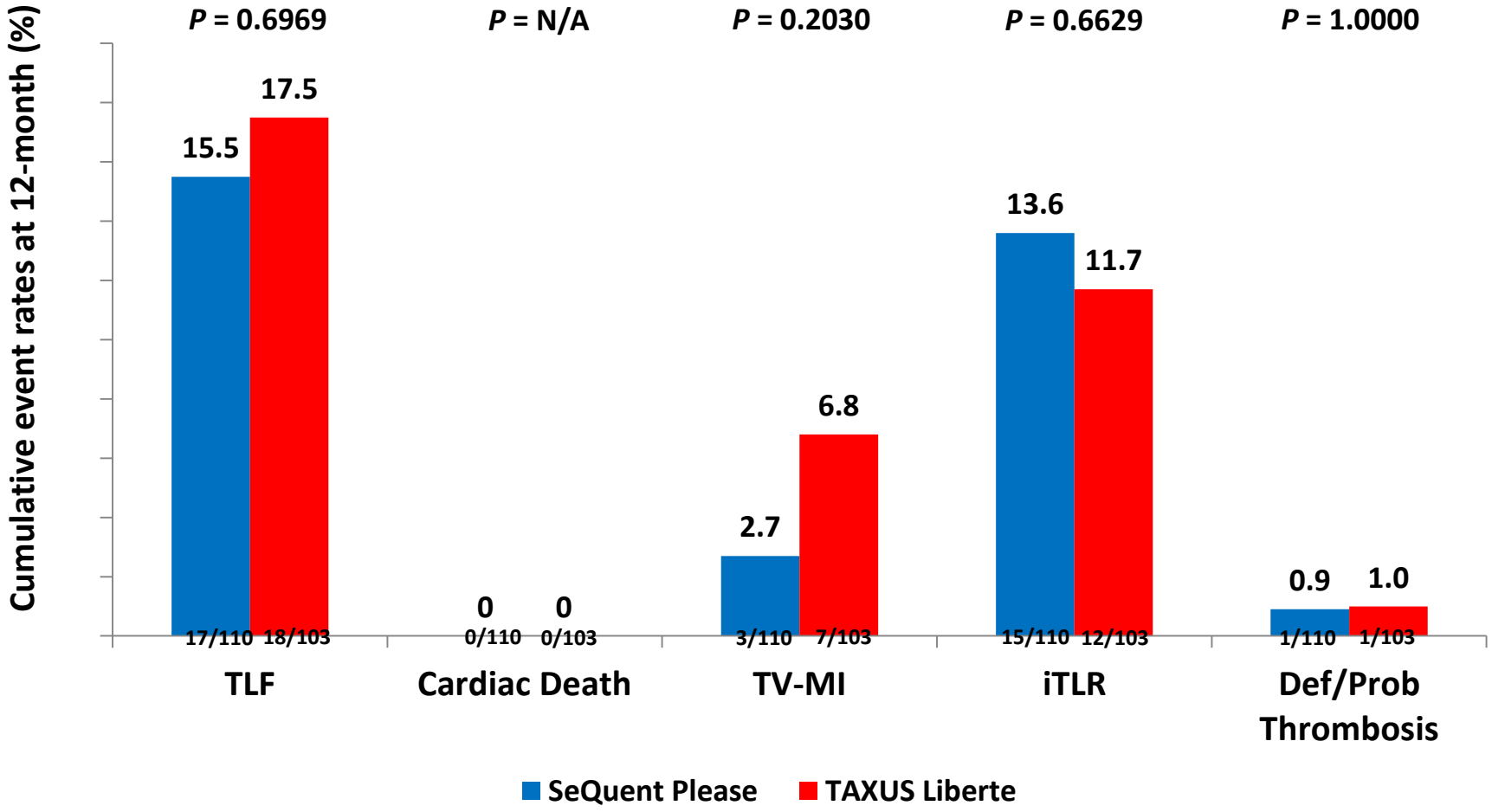
*RVD = Reference vessel diameter; **MLD = Minimal lumen diameter

Target lesion failure to 12 months



Patients at Risk:							
SeQuent Please	109	105	104	104	104	93	92
TAXUS Liberte	106	99	97	96	94	89	87

TLF components at 12-month (As treated set)



Conclusions

- The present study demonstrates that for treatment of DES restenosis PEB (SeQuent Please) is non-inferior to repeat stenting with PES (TAXUS Liberte) in terms of safety and efficacy
- Treatment with PEB should be a better alternative for DES restenosis than repeat implantation of a PES by avoiding additional stent layers

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THANK YOU !!

谢谢 !!