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Which Stenting in the Treatment for Bifurcation Lesions is Effective, Two Stents or One Stent?

Osamu Katoh,M.D.
Kyoto Katsura Hospital Cardiovascular Center

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Objective

The aim of this study is to clarify the efficacy of stenting both the parent vessel and the side branch in the treatment for bifurcation lesions.

Methods (1)

Inclusion Criteria

- The presence of significant lesion(> 60% by QCA) in both the parent vessel and the side branch.
- Reference diameter of side branch > 2.0mm
- Including non protected LMT bifurcation lesions

Exclusion Criteria

- AMI lesion (infarct related artery) < 4weeks

Enrolled Patients

- Of 950 lesions stented in our institution from Feb. 1998 to Jan. 2001, 49 bifurcation lesions met inclusion criteria and all of those pts were enrolled into this study.

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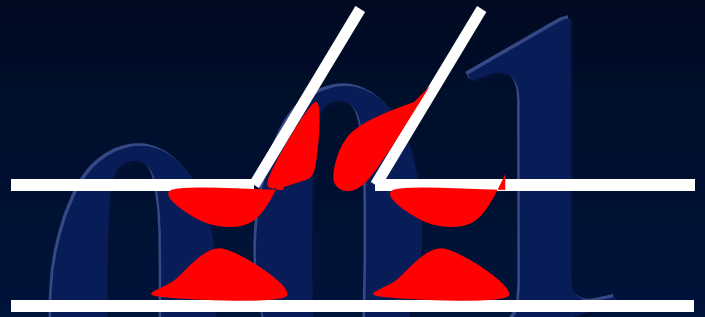
Varieties of Bifurcation Lesions

(Group D: n=16)

(Group S: n=17)

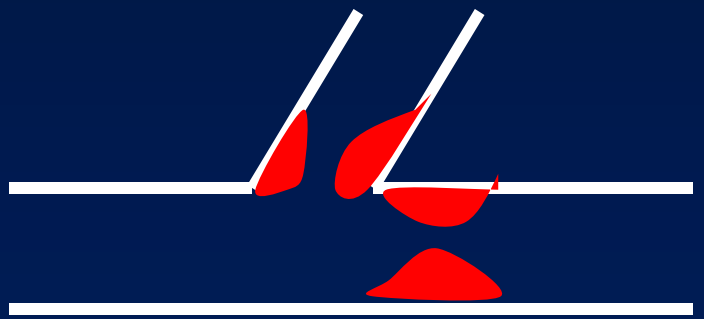


(Group D: n=2)

(Group S: n=2)

(Group D: n=2)

(Group S: n=3)



(Group D: n=4)

(Group S: n=3)

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Methods (2)

Two Strategies for Stent Placement

- **Group D (n=24) : Stenting both vessels (the parent vessel and the side branch)**
- **Group S (n=25) : Stenting the parent vessel and balloon angioplasty for the side branch**

Two Strategies for Stent Placement

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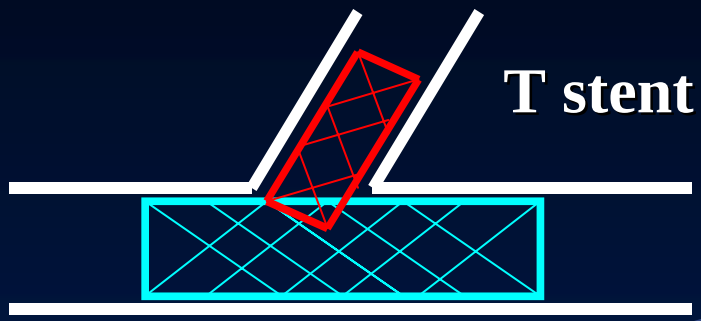
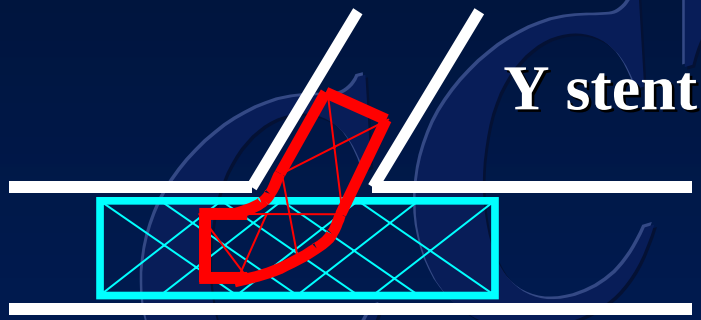
- **Stenting both vessels**
  (Group D, n=24)

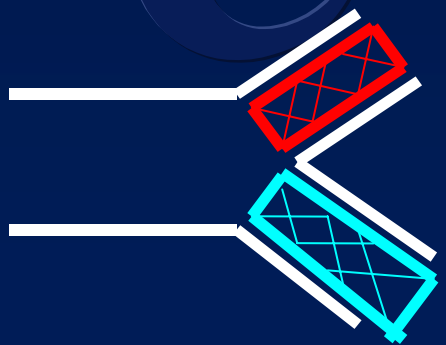
T stent technique



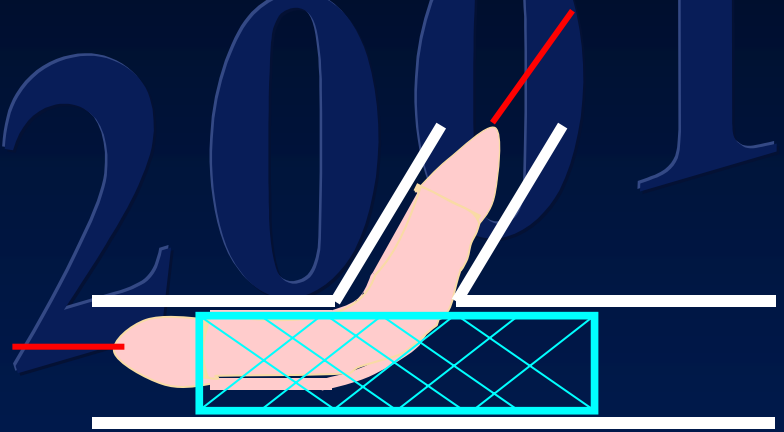
Y stent technique



V stent technique



- **Stenting parent vessel and balloon angioplasty of side branch. (Group S, n=25)**



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Methods (3)

Procedure success

- **Post procedural % DS < 30%**
  (both parent vessel and side branch)
- **without major complication**

Death

MI

Emergent CABG

Quantitative coronary angiography

- **QCA-CMS system**

Follow up angiography

- **6 months**

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Patients Profile (1)

	Group D	Group S	p value
Number of Patients :	24	25	N.S.
Mean Age (yrs) :	68+/-9	65+/-10	N.S.
Male:	71%	65%	N.S.
Unstable Angina:	25%	30%	N.S.
Previous MI:	46%	30%	N.S.
Coronary Risk Factor			
Hypertension:	58%	65%	N.S.
Diabetes:	50%	48%	N.S.
hyperlipidemia:	54%	43%	N.S.
Active Smoker:	38%	30%	N.S.
Previous CABG:	4%	9%	N.S.
Ejection Fraction(%):	2+/-18	56+/-12	N.S.

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Patients Profile (2)

	Group D (n=24)	Group S (n=25)	p value
Extent of CAD			
1 vessel disease	29%	48%	N.S.
2 vessel disease	38%	35%	N.S.
3 vessel disease	33%	17%	N.S.
Bifurcation lesion location			
LAD/LCX	30%	9%	N.S.
LAD/diagonal	48%	68%	N.S.
LCX/OM	9%	9%	N.S.
RCA/PDA	13%	14%	N.S.

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Procedural Data

	Group D (n=24)	Group S (n=25)	p value
Debulking prior to stenting	29%	22%	0.56
DCA	8%	17%	0.34
Rotational atherectomy	21%	4%	0.09
B/A ratio			
Parent vessel	1.10+/-0.12	1.16+/-0.29	0.37
Side branch	1.18+/-0.26	1.16+/-0.23	0.40
Simultaneous kissing	63%	26%	0.012
Maximum pressure (atm)			
Parent vessel	12.6 +/- 3.8	13.3 +/- 4.0	0.59
Side branch	11.9 +/- 3.2	10.4 +/- 4.0	0.15

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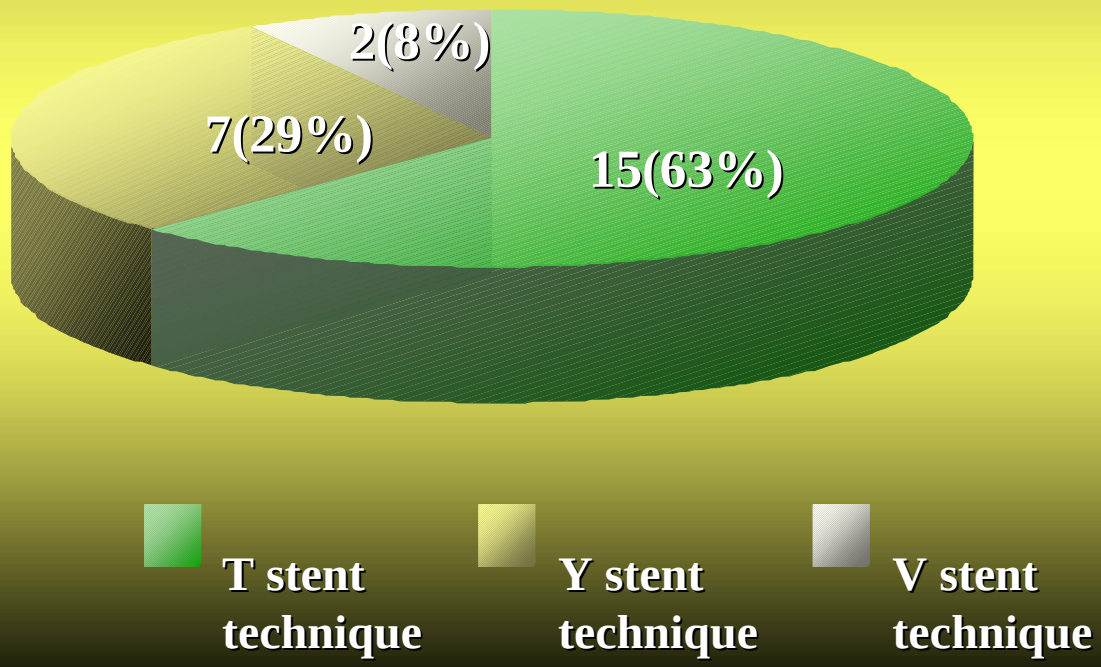
Lesion Characteristics(1)

Both stent placement technique



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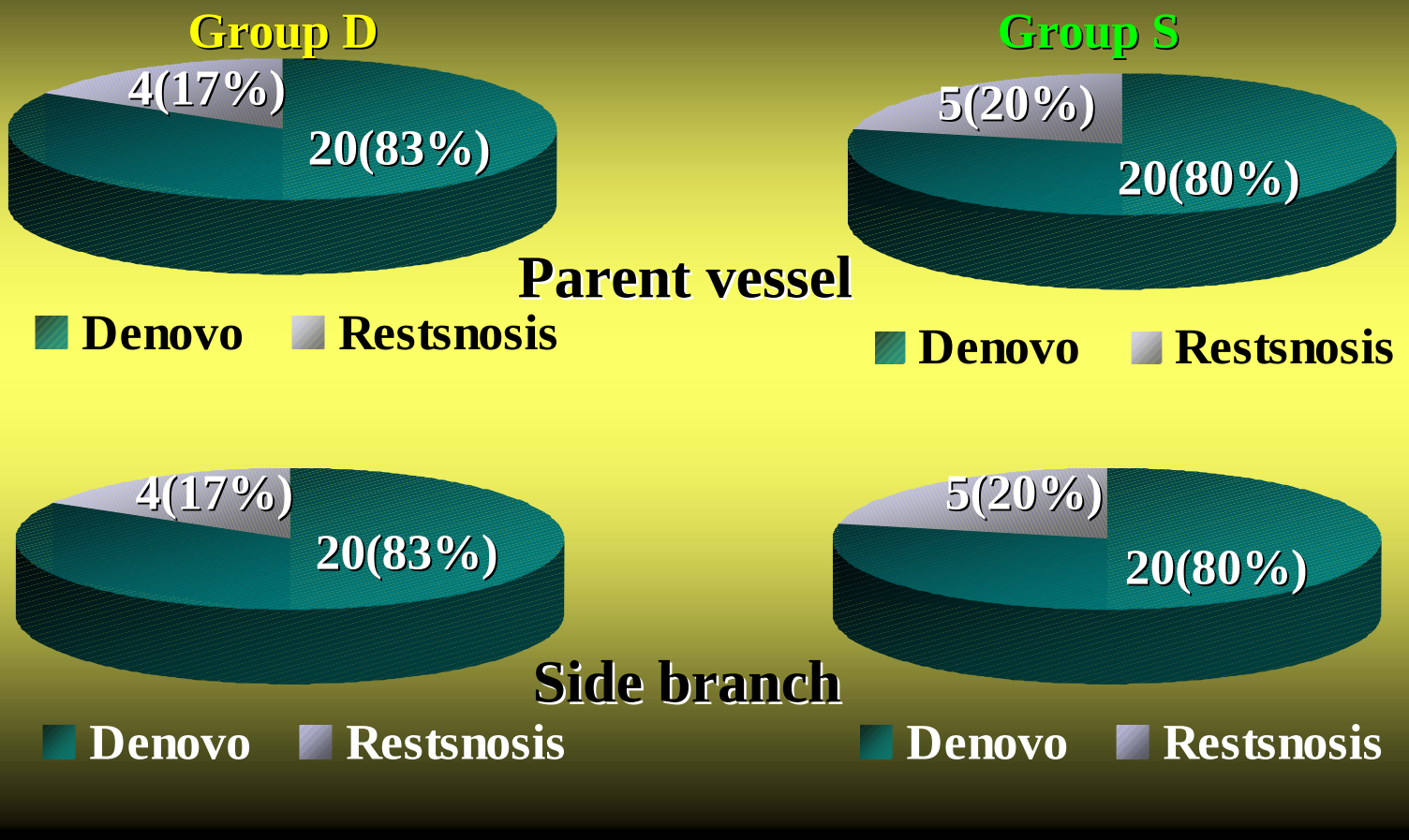
Lesion Characteristics(2)



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Procedural outcome

	Group D (n=24)	Group S (n=25)	p Value
Procedure success (%)	96	78	0.07
Angiographic success (%)	96	78	0.07
In-hospital MACE (%)	4	0	0.57
Death (%)	0	0	
MI (%)	0	0	
QMI (%)	0	0	
Non-QMI (%)	4	0	
CABG (%)	0	0	

QCA (Baseline)

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	Group D (n=24)	Group S (n=25)	p Value
Parent vessel			
Reference Diameter (mm)	3.24+/-0.64	3.02 +/- 0.70	0.27
MLD (mm)	1.15 +/- 0.51	0.92 +/- 0.43	0.09
%DS (%)	67.1 +/- 13.0	68.4 +/- 14.0	0.74
Lesion length (mm)	14.6 +/- 7.03	12.2 +/- 5.61	0.21
Side branch			
Reference Diameter (mm)	2.54 +/- 0.58	2.46 +/- 0.51	0.61
MLD (mm)	0.80 +/- 0.51	0.75 +/- 0.37	0.67
%DS (%)	67.2 +/- 19.6	69.6 +/- 13.3	0.62
Lesion length (mm)	10.6 +/- 6.1	8.3 +/- 4.5	0.15

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QCA (Post procedural results)

	Group D (n=24)	Group S (n=25)	p Value
Parent vessel			
Reference Diameter (mm)	3.58 +/- 0.78	3.43 +/- 0.49	0.42
MLD (mm)	3.12 +/- 0.77	3.12 +/- 0.46	0.98
%DS (%)	12.6 +/- 12.1	12.0 +/- 22.3	0.90
Side branch			
Reference Diameter (mm)	3.03 +/- 0.65*	2.54 +/- 0.72*	0.017
MLD (mm)	2.57 +/- 0.66*	1.92 +/- 0.83*	0.004
%DS (%)	12.8 +/- 15.2	24.1 +/- 24.4	0.061

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QCA results (Follow-up results)

	Group D (n=24)	Group S (n=25)	p Value
Parent vessel			
Reference Diameter (mm)	3.20 +/- 0.83	2.95 +/- 0.51	0.45
MLD (mm)	1.98 +/- 1.13	1.83 +/- 0.64	0.62
%DS (%)	40.8 +/- 24.3	34.4 +/- 21.5	0.40
Lesion length (mm)	12.3 +/- 6.7*	7.8 +/- 3.8*	0.017
Side branch			
Reference Diameter (mm)	2.58 +/- 0.78	2.25 +/- 0.54	0.13
MLD (mm)	1.38 +/- 0.77	1.01 +/- 0.53	0.089
%DS (%)	52.7 +/- 21.1	54.5 +/- 20.1	0.79
Lesion length (mm)	10.1 +/- 4.3*	6.7 +/- 3.1*	0.01

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Follow-up results (1)

	Group D (n=24)	Group S (n=25)	p Value
Angiographic follow-up (%)	83	92	0.71
eligible (%)	24/ 24 (100%)	25/ 25 (100%)	
follow-up duration (Mo)	6.2 +/- 2.9	6.8 +/- 2.7	0.53
Angiographic restenosis (%)	72	74	0.92
Parent vessel (%)	26	23	N.S.
Side branch (%)	52	59	N.S.

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Follow-up results (2)

	Group D	Group S	p Value
	(n=24)	(n=25)	
Clinical follow-up (%)	100	100	0.22
follow-up duration	8.3 +/- 6.4	8.3 +/- 4.6	0.96
TLR (%)	52	55	0.88
repeat PTCA (%)	52	55	
CABG (%)	4	9	
6 months total MACE (%)	52	64	0.44
In-hospital MACE (%)	4	0	N.S.
Death (%)	13	5	N.S.
MI (%)	4	15	N.S.
TLR (%)	52	52	N.S.

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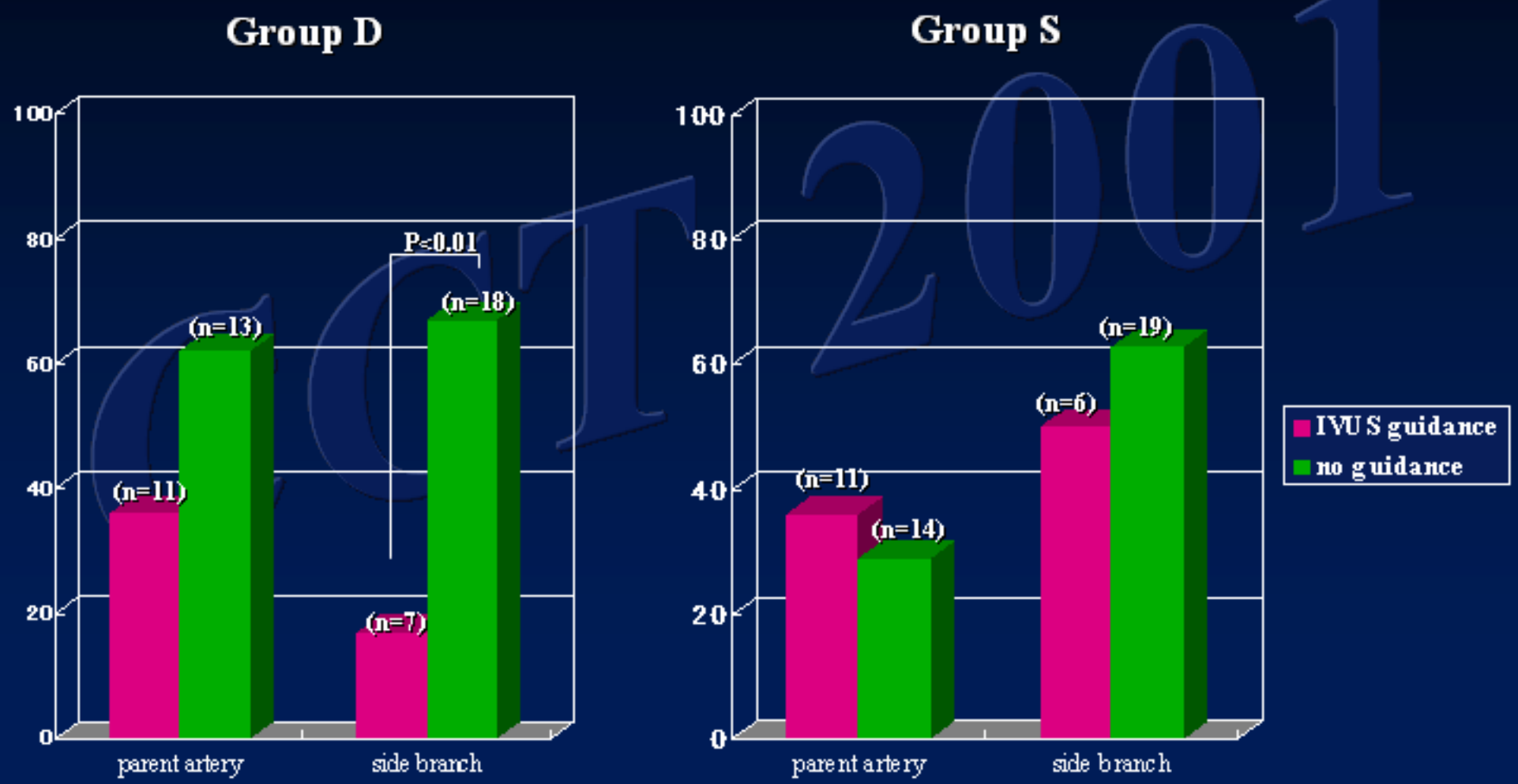
IVUS Guidance Affects Restenosis Rate after Stenting in Bifurcation Lesion



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Summary

- In acute results, group D tended to have a higher angiographic success rate compared to group S. However, late outcome was similar in both groups.

- Planned IVUS after stenting contributed to reduce the restenosis rate after stenting both the parent vessel and the side branch in the treatment for bifurcation lesions.

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Conclusion

The results have not demonstrated an advantage of both vessels stenting in the treatment of bifurcation lesions without guidance of IVUS.