Title

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Intravascular Ultrasound Criteria for Successful Stent Deployment

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Intravascular ultrasound (IVUS) criteria for successful stent deployment were developed by analyzing 67 lesions in 64 patients. Measurements were made proximal and distal to the stent and at the tightest section within the stent. The vessel cross sectional area (CSA) was planimetered at the plaque/media interface. Symmetry index was defined as the lumen minor diameter (diam) divided by the major diam, and % lumen area as the lumen CSA divided by vessel CSA.

		Stented Segment		
	Proximal	First IVUS	Final IVUS	Distal
Lumen CSA	10.5±3.3	6.9±2.0	9.0±2.4*	7.9±3.3
Minor diameter	3.3±0.6	2.7±0.4	3.1±0.5*	2.9±0.6
Major diameter	3.7±0.6	3.2±0.8	3.6±0.5*	3.2±0.8
Symmetry index	0.89±0.08	0.83±0.10	0.86±0.09	0.90±0.07
Vessel CSA	15.6±3.9			12.4±3.7
% lumen CSA	67±22	(49±10)	(65±10)	64±15

*p=0.0001 (Between first and final IVUS)

Based on the IVUS images, further dilatations significantly increased the stented lumen CSA. To use IVUS to guide stent deployment, the following criteria were established: 1) The stent should be fully apposed to the wall; 2) lumen symmetry index should be ≥ 0.7; 3) the stented lumen CSA should be ≥ 60% of the average reference vessel CSA (media to media). Applying these 3 criteria, standard stent insertion procedures produced a 21% success, which increased to 73% success rate after larger balloons or higher pressures were used ($p<0.001$).