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Intravascular Ultrasound Guidance Optimizes Cutting Balloon Angioplasty

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Background. The purpose of the present study was to test whether intravascular ultrasound (IVUS) guidance for Cutting Balloon (CB) angioplasty could improve the acute results of percutaneous coronary interventions (PCI). IVUS guidance may be useful during PCI to optimize angiographic results compared with angiographic guidance alone. When using the CB, accurately sizing the device may enhance the dilatation effect yet protect against the risk of perforation.

Methods. CB angioplasty was used on 151 coronary artery lesions from 103 patients. The coronary lesions were classified into 2 groups: IVUS guided or angiographic guidance alone.

Results. The initial CB success rate was 89% (the CB would not pass through 14 lesions). In 135 successful lesions, the IVUS guided group had a significantly larger MLD and less % diameter stenosis than the angiographic guided group. 78 lesions were also treated with stents (IVUS guided 37, angiography alone 41). The IVUS guided stent group had a larger MLD (3.0 ± 0.3 mm) than the angiographic group (2.8 ± 0.6 mm, $p<0.05$) despite similar reference diameters. One coronary perforation occurred in the angiographic guidance group.

Conclusion. By performing IVUS prior to PCI, the size of the CB can be matched to the media diameter thus optimizing the results compared to angiographic guidance alone. When the CB diameter is based on IVUS measurements, these improved results may be obtained without an increased risk of perforation.

Cutting Balloon	IVUS guided	Angiography alone	p value
# of lesions	63	72	
Reference diameter (mm)	2.9 ± 0.5	2.8 ± 0.6	n.s.
MLD (mm) before	0.7 ± 0.5	0.7 ± 0.5	n.s.
after CB	2.1 ± 0.5	1.9 ± 0.5	$p<0.05$
final	2.8 ± 0.4	2.5 ± 0.6	$p<0.05$