

Update on Laser Angioplasty - Coronary and Peripheral – New Uses for an Aging Device

James R. Margolis, M.D.

Miami International Cardiology Consultants, Miami Beach, FL USA

Purpose It is now twelve years since the first Excimer laser coronary angioplasty procedure in man. Despite disappointing initial results, the procedure continues to be used on a regular basis, and its use is presently growing worldwide at a record pace. The reasons for this rapid growth are improvement in laser techniques and equipment, and the discovery of a host of new indications for the device. This talk will outline these new developments, and attempt to place them within the framework of percutaneous coronary and peripheral interventions in this millennium.

New Equipment New excimer laser catheters – 0.9 mm, 1.7 and 2.0 eccentric, 1.7 and 2.0 C_{OS} and 2.5 mm peripheral – have improved results with present indications and opened a plethora of new indications. Special guidewires and refinement of technique have allowed greater degrees of de-bulking with both conventional and newer catheters without an increase in complications. Point nine catheters are capable of transmitting much higher fluences than conventional catheters. Because of its small diameter, extreme flexibility and high-energy capabilities, it is able to cross otherwise un-crossable lesions, even heavily calcified lesions. It is an ideal solution to problems where it is possible to cross a stenosis with a conventional wire, but not with a Rotablator wire. With the help of new techniques, the eccentric catheters have been demonstrated to ablate areas much larger than their nominal size, especially within restenotic stents. The new C_{OS} catheters use optimal fiber spacing to eliminate dead space. With these catheters ablation areas are 64% greater than with comparably sized conventional laser catheters. The 2.5 mm peripheral is large enough to treat superficial femoral arteries, and has been demonstrated to improve immediate and long-term results with long SFA occlusions.

Old and New Indications For more than a decade, Excimer laser has been accepted as a useful treatment for diffuse disease, un-crossable and/or un-dilatable lesions, and certain types of Saphenous vein graft disease. Recent data using new catheters and new techniques have made it clear that Excimer laser is extremely effective in acute coronary syndromes, certain calcified lesions, for de-bulking prior to stenting and for many peripheral applications. Using proper technique, it may be the treatment of choice for in-stent restenosis, whether or not concomitant Brachytherapy is used. Because thrombus avidly absorbs Excimer laser light, Excimer laser catheters are capable of efficiently ablating thrombus. Recent studies have demonstrated their utility in acute myocardial infarction, unstable angina pectoris and in diffuse Saphenous vein graft disease. Emerging peripheral applications of Excimer laser include long SFA occlusions and infra-geniculate disease, especially in the presence of critical limb ischemia.

Conclusion Excimer laser angioplasty is finally beginning to live up to its initial promise. New techniques and equipment have produced a host of new niche indications. Many of these new indications allow us to treat otherwise untreatable disease.

