Current Status of Vascular Brachytherapy in Hong Kong

On-Hing Kwok, MD

Kwok Tak-Seng Heart Center, Grantham Hospital, The University of Hong Kong, Hong Kong.

【**Background**】Vascular brachytherapy (VBT) has emerged as a viable treatment option in preventing recurrent restenosis after percutaneous coronary intervention (PCI). The first γ-radiation VBT program in Hong Kong was started in Pamela Youde Eastern Hospital in May 00. 16 patients with instent restenosis (ISR) were successfully treated using the Checkmate™ Iridium-192 system with 100% procedural success rate. The 1st β-radiation VBT program was started in Grantham Hospital in July 00, using the Novoste™ Beta-Rail™ system. The Guidant Galileo™ System was introduced to Hong Kong in May 01.

【**Methods**】To determine the safety and efficacy of the Novoste™ Beta-Rail™ (Strontium /Yttrium 90) 40mm source train in preventing recurrent restenosis in Chinese.

【**Results**】From August 2000 to September 2001, 61 patients (43 male) underwent PCI followed by β-radiation brachytherapy in Grantham Hospital. The mean age was 68.4±9.6 (45-86) years. 38 ISR lesions were treated under a surveillance registry protocol. 25 patients were enrolled in a pilot study protocol to evaluate the safety and efficacy of the 40mm source train in reducing restenosis in de novo ostial LAD lesions. Vessels treated were 48 LAD (1 with left main involvement), 4 left circumflex, 8 right coronary arteries, 1 ramus intermedius and 1 saphenous vein graft. Excimer Laser Coronary Angioplasty was used in 4 cases, rotational atherectomy in 2, Angioguard™ distal protection filter-wire in 1 and new stents in 26 patients. Cutting balloon atherotomy was used in 15 cases to minimize deep injury and axial injury length. Device success was 98% and procedural success was 100%. Active dose of 18.4 to 25.3 Gy was prescribed according to the vessel size. Manual pullback technique was used in 12 cases for lesions>26mm. Off-line Quantitative Coronary Angiography analysis was performed using CAAS II QCA Brachytherapy program. Mean pre-procedure reference diameter was 3.14±0.33mm. Minimal Luminal Diameter was increased from 0.23±0.181mm to 3.04±0.52mm. Mean diameter stenosis was reduced from 87.1% to a final residual stenosis of 7.8%. Mean injury and radiated length was 25.7±9.8mm and 46.2±17.2mm, respectively. Geographic miss (GM) was noted in 4 patients. There was no in-hospital MACE. All patients received aspirin for life and clopidogrel for 6-12 months. Mean follow up period was 28.4 (4-58) weeks. There was 1 sudden arrhythmic death 21 days after brachytherapy. No clinical stent thrombosis was recorded. 6-months angiographic follow-up has been completed in 31 patients (22 ISR and 10 de novo ostial LAD lesions; 6 patients received pullback radiation). There was 1 silent late occlusion and no aneurysm. Target vessel failure was recorded in 4 patients during angiographic follow-up (1 de novo and 3 ISR lesions; 2 with pullback VBT). 3 cases were associated with geographic miss. (1 distal GM and 2 insufficient overlap during pullback). One delayed in-lesion focal restenosis was reported 10 months after VBT. Median late lumen loss and late loss index was 0.05mm and 4.7%, respectively.

【**Conclusion**】Intracoronary β-radiation brachytherapy using the 40mm Novoste™Beta-Cath™ system can be performed safely with high device and procedural success rate; and results in lower-than-expected late lumen loss and restenosis rate.