

Clinical outcome of B2/C type isolated proximal LAD disease treated with drug-eluting stents

İlaç kaplı stentlerle tedavi edilen B2/C tipi izole proksimal LAD hastalığının klinik sonuçları

Davran Çiçek, Hasan Pekdemir¹, Nihat Kalay², Haldun Müderrisoğlu³

Department of Cardiology, Faculty of Medicine, Başkent University, Antalya

¹Department of Cardiology, Faculty of Medicine, İnönü University, Malatya

²Department of Cardiology, Faculty of Medicine, Erciyes University, Kayseri

³Department of Cardiology, Faculty of Medicine, Başkent University, Ankara- Turkey

The proximal left anterior descending artery (LAD) is a challenging area for percutaneous coronary intervention (PCI) because of concern for injury to the left main artery or occlusion of major side branches (1). Surgical revascularization and percutaneous stent implantation have proven to be safe and efficient strategies in the relief of symptoms. However, even considering the advantages of PCI, such as less invasiveness, immediate procedural success, short hospital stay and quick recovery results of clinical trials comparing the two treatment options directly show that patients undergoing surgical revascularization have significantly less need for reintervention in the long term (2). With the introduction of a new generation of drug-eluting stents (DESs), late angiographic restenosis rates have been consistently clearly lower than those observed with bare-metal stent implantation (3, 4).

Therefore, we decided to determine the clinical long-term outcome after PCI of the high risk isolated proximal LAD with sirolimus (SES), zotarolimus (ZES), and paclitaxel-eluting (PES) stents in well selected patients.

Patients undergoing PCI of the isolated proximal LAD between January, 2006 and May, 2007 were enrolled the study period in which one of the following DESs was used: CYPHER™ (n=30), TAXUS™ (n=36), ENDEAVOR™ (n=43). Patients were eligible for enrollment if there was an angiographic evidence ACC/AHA Classification B2 or C type lesions (5). Patients with a contraindication to antithrombotic therapy were excluded from the study. The control coronary angiographies were performed between 6 and 12 months and when there is an evidence of ischemia. The operators were free to use the stent approach and the stent. The primary clinical efficacy end points included major adverse cardiac events (MACE) at 2 years (MACE-death, myocardial infarction, target vessel revascularization [TVR]). The secondary end point was definite stent thrombosis. Clinical follow-up was performed at 1, 6, 12, 24 and 36

months by telephone contact or office visit. Mean follow-up was 36.3±3.1 months. Angiographic controls were obtained in 108 (99%) patients. In total, there was one (0.9%) cardiac death reported. The clinical and angiographic characteristics of patients are shown in Table 1. At 3-year follow-up, 1 (0.9%) acute, 2 (1.8%) subacute, 1 (0.9%) late and 1 (0.9%) very late definite stent thrombosis were reported. The incidence of MACE is shown in Table 2. One case of acute thrombosis nine hours after PCI was observed in a patient with myocardial infarction (MI) undergoing rescue angioplasty. In the first week, one patient with non-Q MI and one patient with ST-elevation MI were reported after PCI. Definite stent thrombosis was observed in these patients. Both of two patients did not take clopidogrel after they discharged from hospital. At 6 months follow-up, additional one non-Q MI and one Q-wave MI were reported. One of these patients did not continue clopidogrel after 3 months. And the other one was still on acetyl salicylic acid (ASA) and clopidogrel. A 74-year-old female patient died of acute non-Q MI on the 127th day. She was on ASA but stopped taking clopidogrel after first month. Three patients with unstable angina were treated with coronary artery bypass surgery after coronary angiography and one with stable angina with PCI to non target vessel revascularization. All of these patients were taking ASA, beta-blocker and atorvastatin. But they stop taking clopidogrel after one year. Non-target vessel revascularization were performed to three patient with positive treadmill test at 26, 29, 35 months. Three of the patients were taking ASA, atorvastatin, one of them was taking beta blocker and ace inhibitor for hypertension.

This study describes our experience with ZES, SES, and PES stents to the B2 or C type isolated proximal LAD. The first randomized controlled trial (RCT) with DES showed excellent results (6). Unfortunately, this phenomenon of restenosis was soon demonstrated to keep occurring, but

Address for Correspondence/Yazışma Adresi: Dr. Davran Çiçek, Başkent Üniversitesi Tıp Fakültesi, Kardiyoloji Anabilim Dalı, 07400 Alanya, Antalya-Türkiye
Phone: +90 242 511 25 11 Fax: +90 242 511 55 63 E-mail: davrancicek@mynet.com

Accepted Date/Kabul Tarihi: 11.07.2011 **Available Online Date/Çevrimiçi Yayın Tarihi:** 04.10.2011

©Telif Hakkı 2011 AVES Yayıncılık Ltd. Şti. - Makale metnine www.anakarder.com web sayfasından ulaşılabilir.

©Copyright 2011 by AVES Yayıncılık Ltd. - Available on-line at www.anakarder.com

doi:10.5152/akd.2011.171

Table 1. Baseline patient clinical and angiographic characteristics (n=109)

Age, years	58±10
Diabetes mellitus, n (%)	40 (36)
Hypertension, n (%)	67 (61)
Dyslipidemia, n (%)	76 (69)
History of smoking, n (%)	74 (67)
Prior MI, n (%)	3 (3)
Prior PCI, n (%)	4 (4)
Prior CABG, n (%)	3 (3)
SAP, n (%)	30 (28)
USAP, n (%)	60 (55)
STEMI, n (%)	9 (8.3)
NSTEMI, n (%)	10 (9.1)
Elective PCI, n (%)	30 (28)
ACS, n (%)	79 (72)
Use of Gp IIb/IIIa inhibitors, n (%)	11 (10)
Cypher stent group	30 (27)
Endeavor stent group	43 (39)
Taxus stent group	36 (34)
Mean stent length, mm	26±5
Mean stent diameter, mm	28.2±0.4
Max. implantation pressure, atm	16.2±0.8
Angiographic success, n (%)	109 (100)
ACS - acute coronary syndrome, CABG - coronary artery bypass surgery, Gp - glycoprotein, LAD - left anterior descending coronary artery, MI - myocardial infarction, PCI - percutaneous revascularization, SAP - stable angina pectoris, USAP - unstable angina pectoris	

Table 2. Major cardiac events of study patients at 3 years

TVR, n (%)	
Target vessel PCI	4 (3.6)
CABG	3 (2.7)
Non target-vessel revascularization	4 (3.6)
Myocardial infarction, n (%)	
Q-wave	3 (2.7)
Non-Q-wave	3 (2.7)
Death, n (%)	1 (0.9)
MACE, n (%)	18 (16.5)
CABG- coronary artery binding graft operation, MACE- major adverse cardiac event, PCI- percutaneous revascularization, TVR- target vessel revascularization	

now at a quite lower and unprecedented incidence when compared with that obtained with bare-metal stents (3.2% vs. 35.4%; $p < 0.001$) (7). After the short- and mid-term safety and efficacy of these new stents were verified, some of the setbacks for percutaneous revascularization have been progressively overcome, and studies assessing DES in the treatment of lesions in the common trunk, bifurcations, chronic occlusions, and in sites previously treated with PCI have already been published with encouraging results (8).

However, our discussion is aimed at showing the level of maximum evidence in relation to isolated proximal LAD treatment with these three

stents: one RCT (9) compared the implantation of DES directly with internal mammary artery bypass using a minimally invasive off-pump approach in patients with proximal LAD disease. It showed similar final outcomes with the two strategies: a low MACE and a similar TVR rate were observed in one of the studies (1.7% vs. 5.9%), and a slightly less favorable result for PCI was observed in the other study (14% vs. 2%). Final outcomes of the SIRIUS and TAXUS IV RCT are also available, as regards the subgroup with proximal LAD disease (10, 11). At the end of one year, the TVR rate of the Sirius was 6.0% and TVR of TAXUS IV were 7.9%, respectively. In the same time period in our case series, the cardiac mortality observed (0.9%) was comparable to RCT, and the MACE rates in 7 patients (6.4%) were lower than in those trials. Even when the methodological limitations of our study are considered (small number of patients, non-randomized study without a control group) we can state that PCI in the high risk isolated proximal LAD with DES seems to be a safe and efficient strategy both in the short and long term.

Conflict of interest: None declared.

References

- Kimura BJ, Russo RJ, Bhargava V, McDaniel MB, Peterson KL, Demaria AN. Atheroma morphology and distribution in proximal left anterior descending coronary artery: in vivo observations. *J Am Coll Cardiol* 1996; 27: 825-31. [\[CrossRef\]](#)
- Mercado N, Wijns W, Serruys PW, Sigwart U, Flather MD, Stables RH, et al. One-year outcomes of coronary artery bypass graft surgery versus percutaneous coronary intervention with multiple stenting for multisystem disease: a meta-analysis of individual patient data from randomized clinical trials. *J Thorac Cardiovasc Surg* 2005; 130: 512-9. [\[CrossRef\]](#)
- Popma JJ, Leon MB, Moses JW, Holmes DR Jr, Cox N, Fitzpatrick M, et al. SIRIUS Investigators. Quantitative assessment of angiographic restenosis after sirolimus-eluting stent implantation in native coronary arteries. *Circulation* 2004; 110: 3773-80. [\[CrossRef\]](#)
- Halkin A, Stone GW. Polymer-based paclitaxel-eluting stents in percutaneous coronary intervention: a review of the TAXUS trials. *J Interv Cardiol* 2004; 17: 271-82. [\[CrossRef\]](#)
- Krone RJ, Shaw RE, Klein LW, Block PC, Anderson HV, Weintraub WS, et al. ACC-National Cardiovascular Data Registry. Evaluation of the American College of Cardiology/American Heart Association and the Society for Coronary Angiography and Interventions lesion classification system in the current "stent era" of coronary interventions (from the ACC-National Cardiovascular Data Registry). *Am J Cardiol* 2003; 92: 389-94. [\[CrossRef\]](#)
- Regar E, Serruys PW. The Ravel trial. Zero percent restenosis: A cardiologists dream comes true! *Rev Esp Cardiol* 2002; 55: 459-62. [\[CrossRef\]](#)
- Popma JJ, Leon MB, Moses JW, Holmes DR Jr, Cox N, Fitzpatrick M, et al. SIRIUS investigators. Quantitative assessment of angiographic restenosis after sirolimus-eluting stent implantation in native coronary arteries. *Circulation* 2004; 110: 3773-80. [\[CrossRef\]](#)
- Moreno R. Drug-eluting stents and other anti-restenosis devices. *Rev Esp Cardiol* 2005; 58: 842-62. [\[CrossRef\]](#)
- Kim JW, Lim DS, Sun K, Shim WJ, Rho YM. Stenting or MIDCAB using mini-sternotomy for revascularization of proximal left anterior descending artery? *Int J Cardiol* 2005; 99: 437-41.
- Sawhney N, Moses JW, Leon MB, Kuntz RE, Popma JJ, Bachinsky W, et al. Treatment of left anterior descending coronary disease with sirolimus-eluting stents. *Circulation* 2004; 110: 374-9. [\[CrossRef\]](#)
- Dangas G, Ellis SG, Shlofmitz R, Katz S, Fish D, Martin S, et al. for the TAXUS-IV Investigators: Outcomes of paclitaxel-eluting stent implantation in patients with stenosis of the left anterior descending coronary artery. *J Am Coll Cardiol* 2005; 45: 1186-92. [\[CrossRef\]](#)