

10. BÖLÜM

STENT TROMBOZU VE RESTENOZUNDA PERKÜTAN KORONER GİRİŞİM

Kübra SEVERGÜN¹

GİRİŞ

Koroner arter hastalığı (KAH), ölüme en çok neden olan hastalıklar arasında ilk sıradadır (1). KAH tedavisinde perkütan koroner girişim (PKG) optimal revaskülarizasyon seçeneği olarak popülerliğini giderek artmaktadır (2). İlk PKG 1977 yılında Andreas Gruentzig tarafından uygulanmıştır (3). İlk stent implantasyonu Sigwart tarafından 1985'te gerçekleştirilmiş, kısa sürede hızla yaygınlaşmıştır (4,5). Günümüzde koroner stent uygulamaları en sık başvuru alan revaskülarizasyon yöntemi olup, koroner stent uygulamalarında işlem başarı oranı %95'tir.

Ancak, stent uygulamalarının beraberinde getirdiği en önemli problemler stent içi tromboz ve restenozdur (6-8). Her ne kadar uygulama tekniğindeki ve stent teknolojisindeki gelişmelere paralel olarak stent trombozu ve restenoz oranlarında düşüş izlense de hâlâ bunlar rutin uygulamalardaki en önemli klinik sorunlardır.

STENT TROMBOZU

Stent trombozu, stentlenmiş segmentin trombotik oklüzyonu olarak tanımlanmaktadır. Stent trombozu düşük bir oranda görülür. Ancak klinik olarak önemlidir; çünkü yüksek mortalite ve morbiditeye sahiptir. (9). Son zamanlarda yapılan çalışmalarda ikinci jenerasyon stentlerde 12 aylık dönemde stent trombozu sıklığı %1-2 olarak belirlenmiştir (10).

Stent trombozu oluş zamanına ve kesinlik düzeyine göre iki farklı şekilde sınıflandırılmaktadır. Stent trombozu oluşumuna kadar geçen süreye göre akut,

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KAYNAKLAR

1. Roger VL, Go AS, Lloyd-Jones, et al. Heart disease and stroke statistics--2011 update: A report from the American Heart Association. *Circulation* 2011; 125: 2-220.
2. Bashore TM, Bates ER, Berger P, et al. Clinical Expert Consensus Document on cardiac catheterization laboratory standards: a report of the American Collage of Cardiology Task Force on Clinical Expert Consensus Documents. *J Am Coll Cardiol* 2001; 37: 2170-214.
3. Nabel EG, Braunwald E. A tale of coronary artery disease and myocardial infarction. *The New England journal of medicine*. 2012;366:54-63
4. Sigwart U, Puel J, Mirkovitch V, et al. Intravascular stents to prevent occlusion and restenosis after transluminal angioplasty. *The New England journal of medicine*. 1987;316:701-706
5. Serruys PW, De Jaegere P, Kiemeneij F, et al. A comparison of balloon-expandable-stent implantation with balloon angioplasty in patients with coronary artery disease. Benestent Study Group. *N Engl J Med* 1994; 331: 489-95.
6. Smith SC Jr, Dove JT, Jacobs AK, et al. ACC/AHA guidelines of percutaneous coronary inter-ventions-executive summary. A report of the American College of Cardiology/American Heart Association Task Force on Practice. *J Am Coll Cardiol* 2001; 37: 2215-39.
7. Hannan EL, Racz MJ, Walford G, et al. Long-term outcomes of coronary-artery bypass grafting versus stent implantation. *N Engl J Med* 2005; 352: 2174-83.
8. Mercado N, Boersma E, Wijns W, et al. Clinical and quantitative coronary angiographic predictors of coronary restenosis: a comparative analysis from the balloon-to-stent era. *J Am Coll Cardiol* 2001; 38: 645-52.
9. Ong AT, Hoyer A, Aoki J, et al. Thirty-day incidence and 6-month clinical outcome of thrombotic stent occlusion after bare-metal, sirolimus, or paclitaxel stent implantation. *J Am Coll Cardiol* 2005; 45: 947-53.
10. Kedhi E, Joesoef KS, Mcfadden E, et al. Second generation everolimus-eluting and paclitaxel-eluting stents in real-life practice (COMPARE): a randomised trial. *Lancet* 2010;375 (9710):201-9.
11. Cutlip DE, Windecker S, Mehran R, et al. Academic Research C. Clinical end points in coronary stent trials: A case for standardized definitions. *Circulation*. 2007;115:2344-2351
12. Cutlip DE, Baim DS, Ho KK, et al. Stent thrombosis in the modern era: A pooled analysis of multicenter coronary stent clinical trials. *Circulation*. 2001;103:1967-1971
13. Dangas G, Mehran R, Abizaid AS, et al. Combination therapy with aspirin plus clopidogrel versus aspirin plus ticlopidine for prevention of subacute thrombosis after successful native coronary stenting. *Am J Cardiol*. 2001;87:470-472, A477
14. Daemen J, Wenaweser P, Tsuchida K, et al. Early and late coronary stent thrombosis of sirolimus-eluting and paclitaxel-eluting stents in routine clinical practice: Data from a large two-institutional cohort study. *Lancet*. 2007;369:667-678
15. Honda Y, Fitzgerald PJ. Stent thrombosis: An issue revisited in a changing world. *Circulation*. 2003;108:2-5
16. Pfisterer M, Brunner-La Rocca HP, et al. Late clinical events after clopidogrel discontinuation may limit the benefit of drug-eluting stents: An observational study of drug-eluting versus bare-metal stents. *J Am Coll Cardiol*. 2006;48:2584-2591
17. Wenaweser P, Daemen J, Zwahlen M, et al. Incidence and correlates of drug-eluting stent thrombosis in routine clinical practice. 4-year results from a large 2-institutional cohort study. *J Am Coll Cardiol*. 2008;52:1134-1140
18. Lemesle G, Delhaye C, Bonello L, et al. Stent thrombosis in 2008: Definition, predictors, prognosis and treatment. *Archives of cardiovascular diseases*. 2008;101:769777
19. Baran KW, Lasala JM, Cox DA, et al. A clinical risk score for prediction of stent thrombosis. *Am J Cardiol*. 2008;102:541-545
20. D'Ascenzo F, Bollati M, Clementi F, et al. Incidence and predictors of coronary stent thrombosis: evidence from an international collaborative meta-analysis including 30 studies, 221,066 patients, and 4276 thromboses. *Int J Cardiol* 2013;167(2):575-84.

21. The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). ESC/ EACTS Guidelines on Myocardial Revascularisation. *Eur Heart J* 2014;35:2541-619.
22. Kipshidze N, Dangas G, Tsapenko M, et al. Role of the endothelium in modulating neointimal formation: Vasculoprotective approaches to attenuate restenosis after percutaneous coronary interventions. *J Am Coll Cardiol*. 2004;44:733739
23. Newby AC, Zaltsman AB. Molecular mechanisms in intimal hyperplasia. *The Journal of pathology*. 2000;190:300-309
24. Hoffmann R, Mintz GS, Dussallant GR, et al. Patterns and mechanisms of in-stent restenosis: a serial intravascular ultrasound study. *Circulation* 1996; 94: 1247-54.
25. Pugliese F, Cademartiri F, van Mieghem C, et al. Multidetector CT for visualization of coronary stents. *Radiographics* 2006; 26: 887-904.
26. Mahnken AH. CT imaging of coronary stents: Past, present, and future. *ISRN Cardiology* 2012; doi:10.5402/2012/139823.
27. Van der Hoeven BL, Pires NM, Warda HM, et al. Drug-eluting stents: results, promises and problems. *Int J Cardiol* 2005; 99: 9-17.
28. Narins CR, Ellis SG. Prevention of in-stent restenosis. *Seminars in interventional cardiology: SIIC*. 1998;3:91-103
29. Byrne RA, Joner M, Massberg S, et al. Restenosis in bare metal and drug-eluting stents. In *Coronary stenosis, imaging, structure and physiology*, 1st Edition; Escaned J, Serruys PW, Eds.; Europa Edition: Toulouse, France, 2010; 475-496.
30. Lowe HC, Oesterle SN, Khachigian LM, et al. Coronary in-stent restenosis: Current status and future strategies. *J Am Coll Cardiol*. 2002;39:183193
31. Moreno PR, Palacios IF, Leon MN, et al. Histopathologic comparison of human coronary in-stent and postballoon angioplasty restenotic tissue. *Am J Cardiol*. 1999;84:462-466, A469
32. Mintz GS, Popma JJ, Pichard AD, et al. Arterial remodeling after coronary angioplasty: A serial intravascular ultrasound study. *Circulation*. 1996;94:35-43
33. Mehran R, Dangas G, Abizaid AS, et al. Angiographic patterns of in-stent restenosis classification and implications for long-term outcome. *Circulation* 1999; 100: 1872-1878.
34. Farooq V, Räber L, Gogas BD, et al. In-stent restenosis. In *Percutaneous interventional cardiovascular medicine, the PCR-EAPCI textbook*, 1st Edition; Eeckhout E, Serruys PW, Wijns W, et al, Eds.; Europa Edition: Toulouse, France, 2012; 785-826.
35. Bainey KR, Norris CM, Graham MM, et al. Clinical in-stent restenosis with bare metal stents: Is it truly a benign phenomenon? *Int J Cardiol* 2008; 128: 378-382.
36. Kim MS, Dean LS. In-stent restenosis. *Cardiovasc Ther* 2011; 29: 190-198.
37. Scott NA. Restenosis following implantation of bare metal coronary stents: Pathophysiology and pathways involved in the vascular response to injury. *Adv Drug Deliv Rev* 2006; 58: 358-376.
38. Giacoppo D, Alfonso F, Xu B, et al. Drug-Coated Balloon Angioplasty Versus Drug-Eluting Stent Implantation in Patients With Coronary Stent Restenosis. *J Am Coll Cardiol*. 2020 Jun 2;75(21):2664-2678. doi: 10.1016/j.jacc.2020.04.006.