The Turkish Journal of Invasive Cardiology
TÜRK GİRİŞİMSEL KARDİYOLOJİ DERGİSİ
TJIC Volume:10 Number:4 November 2006
TGKD Cilt: 10 Sayı: 4 Kasım 2006

THREE ANGLE BIFURCATION ANGIOPLASTY AND STENTING

Talantbek Batyraliev, Oğuz Konukoğlu, Aytaç Vural, Önder Demirbaş

Sani Konukoglu Hospital, Cardiology Department, Gaziantep

İlaç salınımlı stentlerin sunumu, girişimsel yan etkiler ve restenoz oranlarındaki düşüşe bağlı olarak günümüz girişimsel kardiyolojisinde önemli gelişmelerin elde edilmesini sağlamıştır. Tüm bu gelişmelere rağmen bifurkasyon lezyonlarında stent tedavisi, yüksek restenoz ve yan etkileri açısından problem yaratmaktadır. Günümüze kadar bifurkasyonlarda birkaç metod tanımlanmasına rağmen, hangi metodun daha başarılı olduğu tartışmalıdır. Bu vaka-sunumunda TABA[s] (Three Angle Bifurcation Angioplasty and Stenting) adını verdiğimiz yeni bir metodun sunumu bulunmaktadır.

Anahtar Kelimeler: Koroner arter hastalığı, Kompleks lezyonlar, Bifürkasyon lezyonlar, Stenting, Anjiyoplasti, PTKA

(Türk Girişimsel Kard. Der. 2006;10:180-183)

INTRODUCTION

The percutaneous treatment of bifurcation lesions is followed by an increased rate of restenosis particularly when both the main vessel and side branch are stented[1,2]. The current practice of interventional cardiology has been revolutionized by the advent of drug-eluting stents, which have been shown to reduce the incidence of major adverse cardiac events, such as death, MI, or target vessel revascularization, and the development of neointimal hyperplasia and restenosis[3-6].

However, the most effective strategy of treating bifurcation lesions is currently undefined. Recent data of bifurcation stenting using a T-technique with sirolimus-eluting stents, though better than historicals using bare stents, showed an overall restenosis rate of 28%[7,8]. The vast majority of these related to restenosis at the ostium of the side branch, which occurred in 22%, may reflect incomplete coverage of the side branch ostium thereby reducing the efficacy of the drug-eluting stent. Ensuring complete coverage of bifurcation lesions with a T-technique requires extreme precision in stent positioning. The angle between the main vessel and side branch in the majority of bifurcations is significantly $< 90°$ which makes it difficult to attain an acceptable T.

The crush technique is a strategy of bifurcation stenting that is technically and relatively easy to perform, and by its nature, always ensures complete ostial coverage of the side branch[8-11]. However dislocation of the stent in the main vessel during, withdrawal of the balloon and the wire may occur. Metal Condensation is another problem[12-14].

The following case illustrate the TABA[s] technique.

CASE REPORT

A 70 year old man was admitted to hospital with stable angina class 3B and known to have coronary artery disease with a previous history of two MI.

Coronary angiography demonstrated significant multivessel disease with a severe stenosis of the right coronary artery, a mildly occluded circumflex artery, and a subtotal stenosis of the LAD just after the seperation of the first diagonal branch (D1). The D1 had also severe ostial disease.

LAD and large first diagonal branch were treated with bifurcation stenting using the TABA[s] technique.

The patient was discharged from hospital the following day and at 3th month he was free of angina.

In this new technique first two guidewires are positioned to the both branches of the bifurcation (Figure 1.1). By using the one of the guidewires the lecton-m (biotronics) 3.5*8 stent is implanted to the main branch (Figure 1.2, Figure 1.3). The guidewire (the one, not used to inflate the balloon) is pulled up and then moved ahead between the spaces of the stent (Figure 1.4). Then using the guidewires the lecton-m (biotronics) 2.75*20 and 2.75*15 stents are deployed to the branch vessels (Figure 1.5, Figure 1.6,). Two side branch stents are inflated at the same time (Figure 1.7). Then a long balloon catheter (a

Yazışma adresi: Prof. Dr. Talantbek BATYRALİEV
Sani Konukoğlu Hospital,
Cardiology Department, Gaziantep

Figure 1

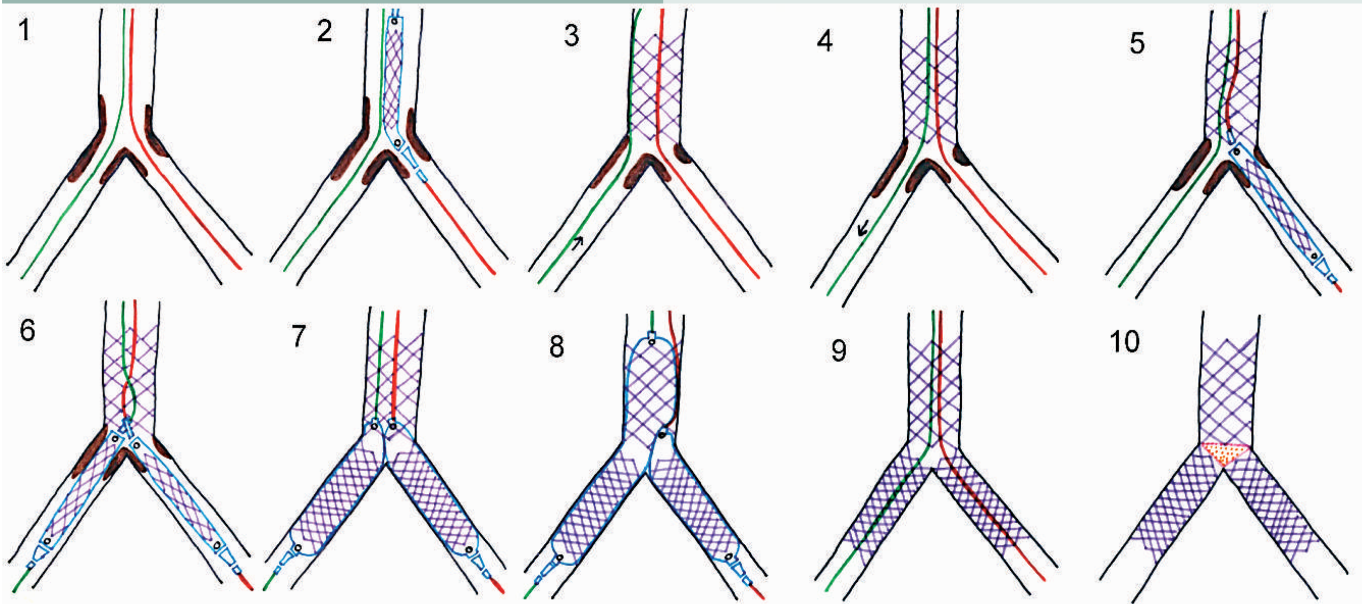
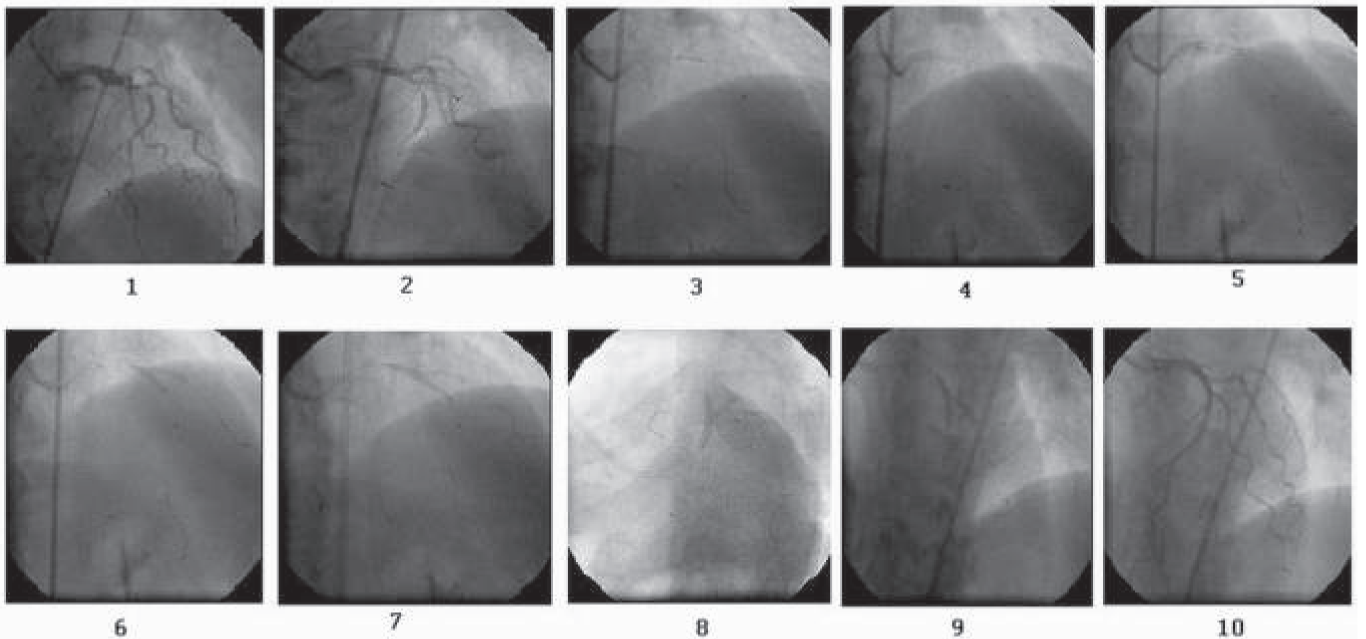


Figure 2



longer balloon than the others) is inserted from one branch containing the main branch and one side branch (Figure 1.8). The remaining one side branch balloon and new inserted main and side balloon inflated simultaneously to take the optimal result (Figure 1.8). In other techniques such as crush and T technique, in the attachment parts of the stents metal condensation occurs and this may cause restenosis. By TABA[S] technique one stent do not override on other (Figure 1.9). By this way there is only one layer of stent seen on the surface of the vessel. However when we deploy the stents a small triangle occurs on the center of the bifurcation which is free of stent (Figure 1.10). Therefore a lesion on the center of the bifurcation may not be corrected.either demonstration could be seen on Figure 2.

Occurence of metal density on illustration in crush technique is shown in Figure 3. On Figure 4 by TABA[S] no metal deposit occurs.

Figure 3

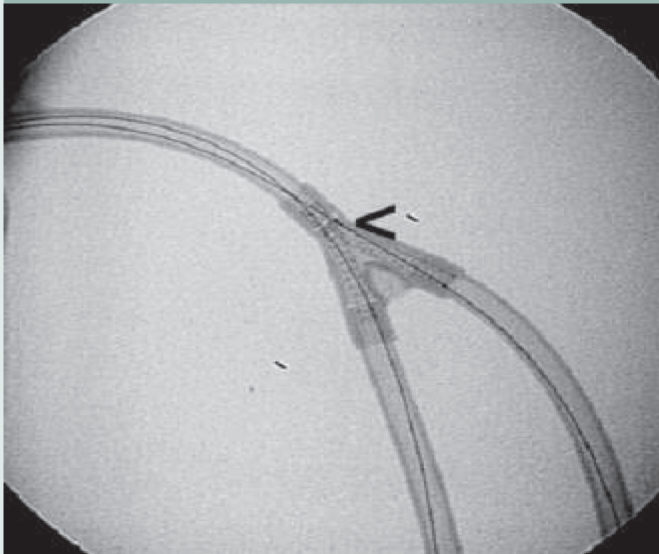
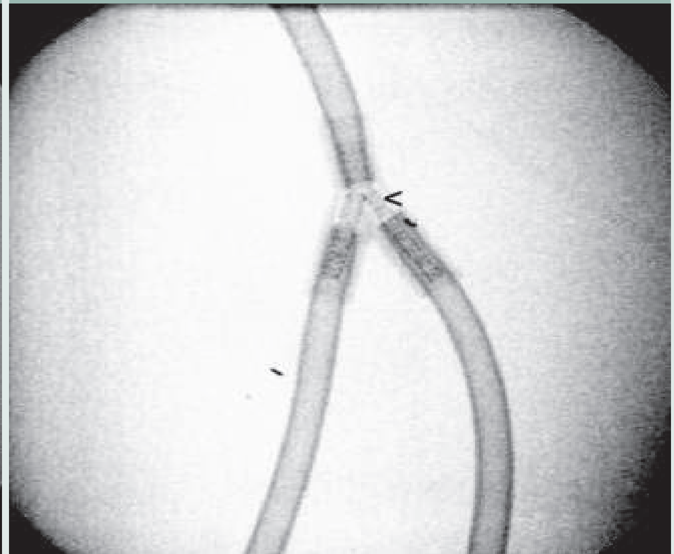


Figure 4



CONCLUSION

In this case TABA[s] technique is described for development of bifurcation lesions in coronary arteries which are difficult to treat than a linear arterial lesion. There were initial concerns regarding the potential for stent thrombosis particularly because of the high metal density at the carina[8,10]. This technique potentially prevents the occurence of metal density at the carina and may decrease the major thrombotic symptoms such as MI, cardiogenic shock[8]. As far as the long-term results and rates of restenosis are concerned, the available data are still preliminary.

REFERENCES

1. Anzuini A, Briguori C, Rosanio S, Tocchi M, Pag notta P, Bonnier H, Gimelli G, Airoldi F, Margonato A, Legrand V, Colombo A. Immediate and long-term clinical and angiographic results from Wiktor stent treatment for true bifurcation narrowings. Am J Cardiol 2001; 88: 1246-50.
2. Pan M, Suarez de Lezo J, Medina A, Romero M, Hernandez E, Segura J, Castroviejo JR, Pavlovic D, Melian F, Ramirez A, Castillo JC. Simple and complex stent strategies for bifurcated coronary arterial stenosis involving the side branch origin. Am J Cardiol 1999; 83: 1320-25.
3. Moses JW, Leon MB, Popma JJ, Fitzgerald PJ, Holmes DR, O'Shaughnessy C, Caputo RP, Kereiakes DJ, Williams DO, Teirstein PS, Jaeger JL, Kuntz RE, SIRIUS Investigators. Sirolimus-eluting stents versus standard stents in patients with stenosis in a native coronary artery. N Engl J Med 2003; 349: 1315-23.
4. Hoye A, Lemos PA, Aoki J, Arampatzis CA, Saia F, Lee CH, Degertekin M, Hofma SH, Sianos G, McFadden E, Smits PC, van der Giessen WJ, de Feyter P, van Domburg RT, Serruys PW. Restenosis rates following bifurcation stenting with sirolimus-eluting stents for de novo narrowings. Am J Cardiol 2004; 94: 115-18.
5. Stone GW, Ellis SG, Cox DA, Hermiller J, O'Shaughnessy C, Mann JT, Turco M, Caputo R, Bergin P, Greenberg J, Popma JJ, Russell ME. A polymer-based, paclitaxel-eluting stent in patients with coronary artery disease. N Engl J Med 2004; 350: 221-31.
6. Lemos PA, Serruys PW, van Domburg RT, Saia F, Arampatzis CA, Hoye A, Degertekin M, Tanabe K, Daemen J, Liu TK, McFadden E, Sianos G, Hofma SH, Smits PC, van der Giessen WJ, de Feyter PJ. Unrestricted utilization of sirolimus-eluting stents compared with conventional bare stent implantation in the real world: The rapamycin-eluting stent evaluated at Rotterdam Cardiology Hospital (RESEARCH) registry. Circulation 2004; 109: 190-95.
7. Colombo A, Moses JW, Morice MC, Ludwig J, Holmes DR, Jr, Spanos V, Louvard Y, Desmedt B, Di Mario C, Leon MB. Randomized study to evaluate sirolimus-eluting stents implanted at coronary bifurcation lesions. Circulation 2004; 109:1244-49.
8. Colombo A, Stankovic G, Orlic D, Corvaja N, Liistro F, Airoldi F, Chieffo A, Spanos V, Montor fano M, Di Mario C. Modified T-stenting technique with crushing for bifurcation lesions: Imme diate results and 30-day outcome. Catheter Cadiovasc Interv 2003; 60: 145-51.
9. Ormiston JA, Currie E, Webster MW, Kay P, Ruygrok PN, Stewart JT, Padgett RC, Panther

MJ. Drug-eluting stents for coronary bifurcations: Insights into the crush technique. Catheter Cardiovasc Interv 2004; 63: 332-36.
10. Georgios Sianos, MD, PhD*, Sofia Vaina, MD, PhD, Angela Hoye, MB, ChB, MRCP, Patrick W. Serruys, MD, PhD. Bifurcation stenting with drug eluting stents: illustration of the crush technique. Catheter Cardiovasc Interv. 2006;67:839-45.
11. Kim YH, Park SW, Hong MK, Park DW, Park KM, Lee BK, Song JM, Han KH, Lee CW, Kang DH, Song JK, Kim JJ, Park SJ. Comparison of simple and complex stenting techniques in the treatment of unprotected left main coronary artery bifurcation stenosis. Am J Cardiol. 2006 ;97:1597-601.
12. Collins N, Dzavik V. A modified balloon crush approach improves side branch access and side branch stent apposition during crush stenting of coronary bifurcation lesions. Catheter Cardiovasc Interv. 2006;68:365-71.
13. Sharma SK, Kini AS. Coronary bifurcation lesions. Cardiol Clin. 2006 May;24:233-46.
14. Costa RA, Moussa ID. Percutaneous treatment of coronary bifurcation lesions in the era of drug-eluting stents. Minerva Cardioangiol. 2006;54:577-89.