

An alternative approach in tortuous coronary artery and distal stenosis during transradial percutaneous coronary intervention: deep engagement by a 5-Fr guiding catheter

Transradial perkütan koroner girişim sırasında kıvrımlı koroner arter ve distal darlık için bir seçenek: 5 Fr kılavuz kateter ile derin kavrayış

Ziad Said Dahdouh, M.D., Vincent Roule, M.D., Rémi Sabatier, M.D., Gilles Grollier, M.D.

Department of Interventional Cardiology, CHU de Caen, Caen, F-14000, France

Summary – Transradial approach for percutaneous interventions has emerged as an alternative to transfemoral access which is known to be more associated with vascular local complications. However, lack of guiding-catheter support via the radial access is one of the problems encountering the operators. Many solutions have been proposed to overcome this problem. We report on a 62-year-old man with tight stenosis of the distal part of the right coronary artery. He underwent coronary angiography and then percutaneous angioplasty via the right radial artery. During the procedure, attempts to advance a stent beyond a tortuosity at the level of the second segment failed due to lack of support of the 6-Fr Judkins right 4 guiding catheter, even with the buddy wire technique. Then, switching to a 5-Fr Judkins right 4 guiding catheter allowed safe deep engagement and resulted in successful advancement and deployment of the stent.

Transradial coronary angiography or intervention has been associated with a lower frequency of vascular access site complications,^[1] with similar success rates.^[2] Bleeding and transfusion after percutaneous interventions are correlated with mortality.^[3] Indeed, transradial coronary stenting using 5-Fr guiding catheters has been associated with a higher procedural success rate and a lower frequency of vascular access complications, particularly in patients with small radial artery diameters, in comparison to 6-Fr transradial coronary interventions.^[1] The buddy wire technique is known to provide additional support by straight-

Özet – Perkütan girişimlerde transradial yaklaşım, vasküler lokal komplikasyonlarla daha fazla ilişki gösteren transfemoral yaklaşıma seçenek olarak geliştirilmiştir. Bununla birlikte, radyal yaklaşım sırasında yeterli kılavuz kateter desteğinin sağlanamaması girişimcilerin karşılaştığı sorunlardan biridir. Bu sorunu aşmak için birçok teknik ileri sürülmüştür. Bu yazıda, sağ koroner arterin distal kısmında ciddi darlık olan 62 yaşında erkek hasta sunuldu. Hastaya koroner anjiyografi ve sonrasında sağ radyal arter yoluyla perkütan girişim yapıldı. İşlem sırasında, 6 Fr Judkins sağ 4 kılavuz kateterin yeterli destek sağlayamaması nedeniyle, “buddy” tel tekniği de denenmesine karşın, ikinci segmentteki kıvrımdan stent lezyona ilerletilemedi. Daha sonra, 5 Fr Judkins sağ 4 kılavuz kateter yerleştirilerek güvenli derin destek sağlandı ve stent başarıyla ilerletilerek lezyona yerleştirildi.

ening the coronary artery mainly in case of coronary tortuosity upstream to the lesion.^[4] Furthermore, some distal coronary lesions may resist the advancement of the stent due to lack of support of the guiding catheter, reducing the success rate of the transradial approach. We report on a case with tight stenosis of the distal part of the right coronary artery, where the buddy wire technique was not sufficient to advance the stent till the lesion with the transradial access and switching to a 5-Fr guiding catheter allowed safe deep engagement.

Abbreviations:

JR4 Judkins right 4
RCA Right coronary artery

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Correspondence: Ziad Said Dahdouh, M.D. Avenue Cote De Nacre 14000 Caen, France.
Tel: 0033 629362232 e-mail: ziad_dahdouh@hotmail.com

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CASE REPORT

A 62-year-old man with a history of hypercholesterolemia presented to our hospital with recurrent angina and positive stress test. There was no past history of cardiovascular disease. He underwent coronary angiography via the right radial artery using a 6-Fr arterial sheath, which revealed a critical tight stenosis in the third segment of the right coronary artery (Fig. 1a), which was smooth except for a tortuosity at the level of the second segment, and a significant but less tight stenosis in the proximal part of the left anterior descending artery. We decided to treat the lesion of the RCA first with *ad hoc* percutaneous angioplasty. For this purpose, we used a 6-Fr Judkins right 4 guiding catheter (Launcher, Medtronic, Minnesota, USA) and advanced a guide wire 0.014 with ICE hydrophilic coating (ChoICE, Floppy LS, Boston Scientific, Massachusetts, USA) to the distal part of the posterior descending artery. After that, we were unable to advance a BioMatrix 2.5 x 24 mm stent (Biosensors International Group, Singapore) beyond the mid portion of the second segment of the RCA due to lack of support of the 6-Fr guiding catheter moving back in the aorta. Then, we used the buddy wire technique by advancing a second stiff guide wire (ChoICE Extra Support, Boston Scientific) along the first one, but we were still unable to go far with the stent. Eventually, we ex-

changed the guiding catheter for a 5-Fr JR4 (Launcher, Medtronic) with deep intubation over the floppy guide wire far in the second segment of the RCA (Fig. 1b), allowing the advancement of our drug-eluting stent till the lesion. We deployed the stent (Fig. 1c) and performed postdilatation using a Quantum 2.5 x 15 mm balloon (Boston Scientific) at 18 atm. The final angiographic appearance was good with no residual stenosis (Fig. 1d). There was no dissection in the proximal or median segments of the RCA (Fig. 1e) where the guiding catheter was deeply intubated. Postprocedural recovery was uneventful. The patient was pretreated by a loading dose of clopidogrel (300 mg, followed by 75 mg/day), aspirin (160 mg/day), and heparin (1 mg/kg) before the coronary intervention. Few weeks later, he underwent a subsequent percutaneous intervention for the lesion in the left anterior descending artery and remained symptom-free at one year.

DISCUSSION

Some coronary stenoses may require a potent guiding catheter support, especially with the transradial approach, to permit the stent's advancement till the target point. Despite improvements in the balloons' and stents' profile, delivery of devices to tortuous vessels remains challenging, especially when guide support is suboptimal.^[4] Poor guide support, vessel tortuosity, cal-

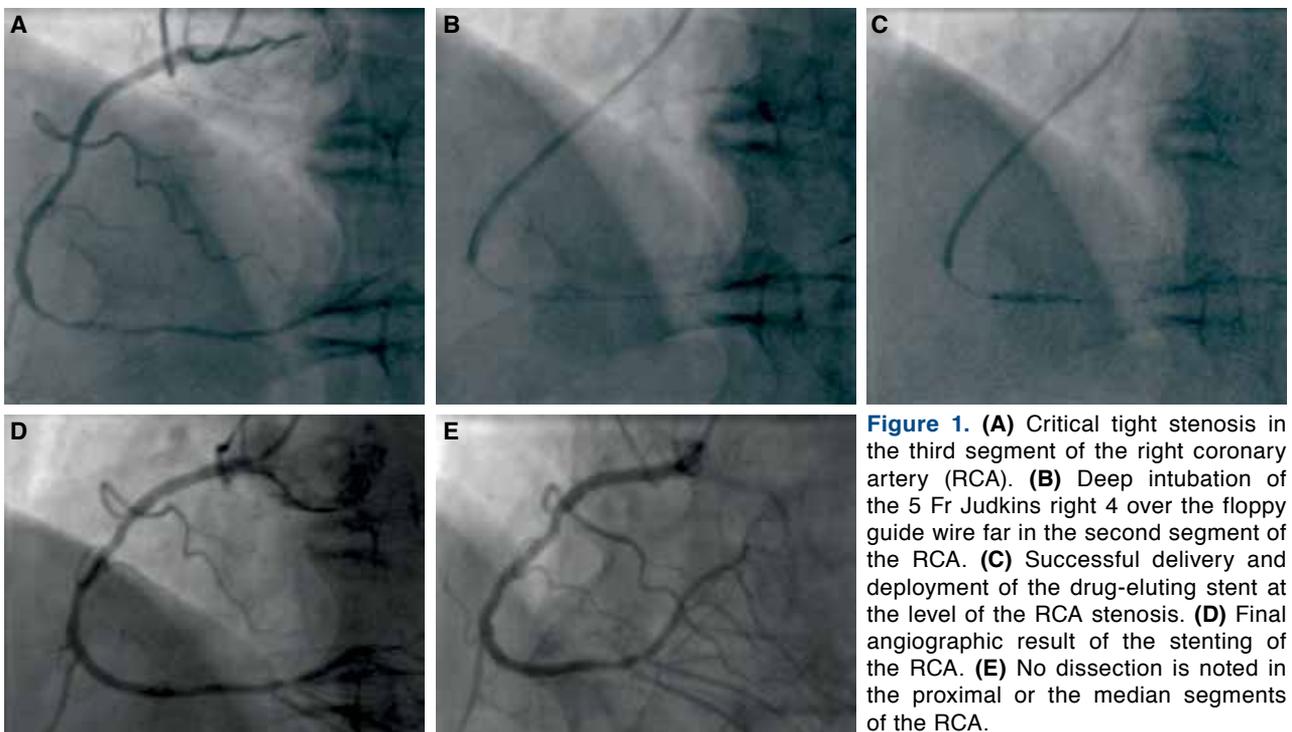


Figure 1. (A) Critical tight stenosis in the third segment of the right coronary artery (RCA). (B) Deep intubation of the 5 Fr Judkins right 4 over the floppy guide wire far in the second segment of the RCA. (C) Successful delivery and deployment of the drug-eluting stent at the level of the RCA stenosis. (D) Final angiographic result of the stenting of the RCA. (E) No dissection is noted in the proximal or the median segments of the RCA.

cification, and/or prior stent placement are conditions making the coronary lesions difficult to cross.^[5] The buddy wire technique is useful in such situations, with a second 0.014-inch coronary artery guide wire placed alongside the first working wire, thereby straightening the coronary artery, improving guide support, and allowing successful delivery of the devices through calcified and/or tortuous vessels.^[5] However, this technique may sometimes be insufficient, pushing the operator to bail out and switch to the femoral approach, which is known to have better support but an increased risk for vascular complications.^[2]

On the other hand, three factors have been associated with the backup force: catheter size, angle on the reverse side of the aorta, and contact area.^[6] Thus, 6-Fr guiding catheters have better passive support compared to 5-Fr guiding catheters and deep seating of the guide catheter may lead to success.^[7] Although deep intubation with 6-Fr guiding catheters may be safely used to potentiate the guiding support through the transradial approach,^[8] we believe that local complications per se, namely, coronary dissection at the site of intubation, may still occur especially when the coronary ostia or the proximal segments of the coronary arteries are not free of atheromatous plaques. Therefore, to avoid switching from transradial to femoral access, having recourse to a 5-Fr guiding catheter via the transradial access, but with careful and deep engagement in the concerned coronary artery, may be a solution in such situations, providing active support.

In our patient, we used the buddy wire technique through a 6-Fr radial approach to straighten the coronary artery, but failed to advance the stent even beyond the second segment of the RCA. However, use of a 5-Fr JR4 guiding catheter with deep engagement provided an active support that, in our opinion, was higher than the passive support of the 6-Fr JR4 guiding catheter, suggesting that the initial barrier was lack of support due to the snagging of the stent in the tortuosity of the second segment of the RCA. No dissection was observed at the end of the procedure.

Our strategy may be an alternative to switching to the femoral approach after having started the conventional radial access, with the potential risks of deep intubation in mind even when using a 5-Fr guiding catheter. This can avoid two accesses-site punctures which give rise to both local complications and patient discomfort.

In conclusion, this case shows that using a 5-Fr guiding catheter via the transradial approach with careful deep cannulation might be a solution to compass lack of support, obviating the need for a femoral access.

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Key words: Angioplasty, balloon, coronary; heart catheterization/instrumentation; radial artery; stents.

Anahtar sözcükler: Anjiyoplasti, balon, koroner; kalp kateterizasyonu/enstrümantasyon; radyal arter; stent.