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Innovative Technique for Evacuating Side Branch in Bifurcation Lesion

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Abstract

Treatment of bifurcation lesions changes according to lesion characteristics and the patient's clinical diagnosis, including acute or chronic coronary syndrome. Treatment of bifurcation lesions in patients with acute coronary syndrome (ACS) is more difficult. We presented an innovative treatment for a bifurcation lesion in a patient with ACS.

Keywords: Coronary bifurcation, thrombus aspiration catheter, acute coronary syndrome

INTRODUCTION

Bifurcation lesions are considered to be a serious problem in invasive cardiology. Treatment of bifurcation lesions in patients with acute coronary syndrome (ACS) is more difficult. We presented an innovative treatment for a bifurcation lesion in an ACS patient.^[1]

CASE REPORT

A 59-year-old male patient was admitted to the emergency department with two hours of chest pain. He was diagnosed with hyperacute anterior myocardial infarction in the emergency department. The cardiac risk factor for the patient was smoking. He was transferred urgently to the catheterization laboratory to perform percutaneous coronary intervention (PCI). We performed coronary angiography via the right femoral access. The left anterior descending coronary artery (LAD) was occluded from the mid-portion (Figure 1a). The completely occluded part of LAD was passed with a soft wire (Choice floppy - Boston Scientific) gently. Consecutive pre-dilatation

was performed using a 2.0*20 balloon (Sprinter - Medtronic). After balloon inflation, we took consecutive films to evaluate the lesion and plan the interventional strategy.

There was a serious lesion in the mid-portion of LAD before diagonal 1 (D1) bifurcation. We preferred provisional LAD stenting. Also, D1 was wired (Choice floppy - Boston Scientific).

Then a 3.0*24 drug-eluting stent (DES) (Promus - Boston Scientific) was inserted into the mid-LAD. We performed proximal optimization (POT) via a 3.5*12 non-compliant (NC) balloon (Sprinter - Medtronic) without passing the carina after stent implantation. The total occlusion of LAD was completely resolved. However, serious plaque shifting developed into D1 (Figure 1b).

We decided to make a kissing balloon to restore plaque shifting into D1 without disturbing LAD flow. We rewired D1 (Choice floppy - Boston Scientific) and performed kissing balloon inflation with two NC balloons (3.0*20 Sprinter - Medtronic for LAD and 2.75*20 Sprinter - Medtronic for D1) (Figure 1c). After

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kissing balloon inflation, we saw no reflow in the D1 artery. We thought dissection was the main cause of no reflow in the D1 artery (Figure 1d). We inserted a 2.75*28 DES (Promus - Boston Scientific) into the D1 artery using the T and small protrusion technique (Figure 1e). No reflow was observed in the D1 artery after stent implantation (Figure 1f). We did not get a response to 500 ug intracoronary adenosine.

If you were the operator in this case, what would you do?

We decided to evaluate the distal part of the D1 stent via a thrombus aspiration catheter (TAC). We passed the distal part of the D1 stent via 6F TAC (Medtronic, Minneapolis, MN, USA). Blood was drawn back, and 2 cc opaque was given to ensure that the catheter was in the artery lumen. There was serious dissection in the distal part of the stent (Figure 2). We decided to insert another stent to overlap the first stent. Finally, we restored the D1 flow and completed the procedure with final kissing and POT (Figure 1g).

We took control of angiography one month later. LAD and D1 stents were patent, and thrombolysis in myocardial infarction

III flow was observed in both arteries (Figure 1h). The study complied with the Declaration of Helsinki and informed consent has been obtained from the participant.

DISCUSSION

There are some techniques for treating bifurcation lesions, including provisional, mini crush, double kissing, and T stent. Treatment of bifurcation lesions changes according to lesion characteristics and the patient's clinical diagnosis, including acute or chronic coronary syndrome (CCS). Operators are more comfortable in treating bifurcation lesions in CCS patients than in ACS patients. Because they have more time and are ready for treatment techniques with planning before.^[1]

If operators perform PCI in bifurcation lesions in ACS patients, they may encounter additional ACS problems not only in bifurcation lesions. Because ACS patients have unstable clinical situations due to thrombotic unstable plaque, TAC was developed for thrombus aspiration, especially in ACS patients. However, we used TAC in a bifurcation lesion in an ACS patient to evaluate side branch flow for discrimination thrombus,

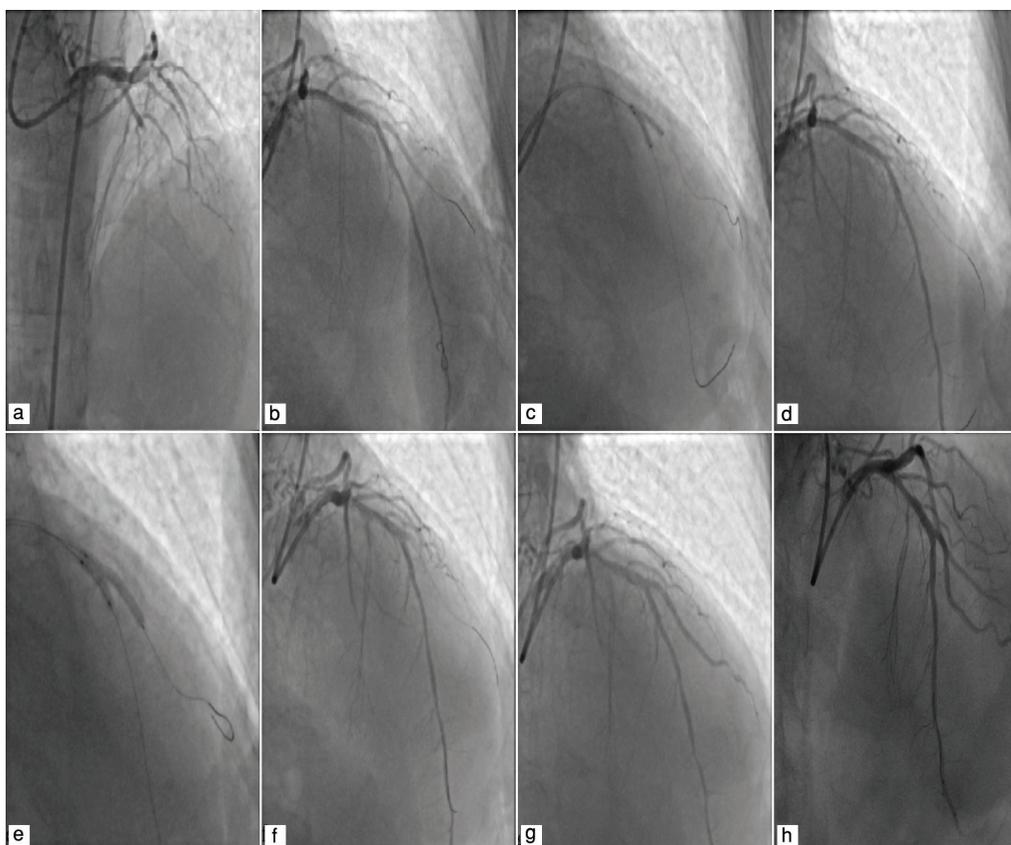


Figure 1: a) Totally occluded LAD artery. b) Serious plaque shift into the D1 artery. c) Kissing balloon inflation in bifurcated LAD-D1 arteries. d) No reflow in the D1 artery. e) Insertion of a DES into the D1 artery using the T and small protrusion technique. f) No reflow in the D1 artery after stent implantation. g) Restored flow in the D1 artery. h) Thrombolysis in myocardial infarction III flow in LAD and D1 arteries after one month later

LAD: Left anterior descending coronary artery, D1: Diagonal 1, DES: Drug-eluting stent

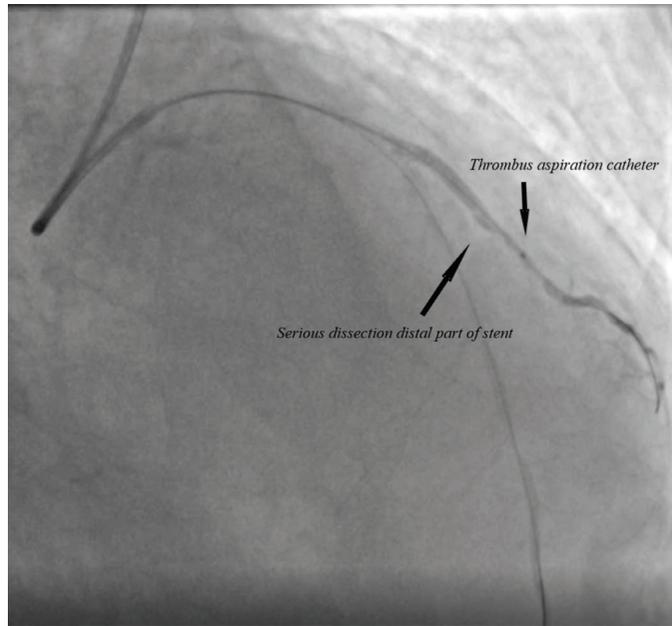


Figure 2: Serious dissection of the distal part of the stent in the D1 artery

D1: Diagonal 1

dissection, and no-reflow. First, TAC was used to visualize the occluded distal part of the side branch vessel in this case. Second, we do not need to change the wire in the side branch, contrary to the microcatheter. However, the optimal method to evaluate the distal part of the side branch is intravascular ultrasonography (IVUS) or optic coherence tomography (OCT) in this case. However, we did not manage to use this equipment due to technical reasons in an emergency. TAC was used to visualize the occluded distal part of the stent.^[2-4]

CONCLUSION

If imaging techniques such as IVUS or OCT are unavailable, TAC can be used in emergencies to evaluate the distal part of the stent in case of no reflow, as in our case.

Ethics

Informed Consent: Informed consent has been obtained from the participant.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: R.G., B.S.Y., Concept: B.S.Y., Design: R.G., Data Collection or Processing: B.S.Y., Analysis or Interpretation: S.Ö., Literature Search: R.G., B.S.Y., Writing: R.G.

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REFERENCES

1. Burzotta F, Lassen JF, Louvard Y, Lefèvre T, Banning AP, Doremont O, *et al.* European Bifurcation Club white paper on stenting techniques for patients with bifurcated coronary artery lesions. *Catheter Cardiovasc Interv* 2020;96:1067-79.
2. Longobardo L, Mattesini A, Valente S, Di Mario C. OCT-guided Percutaneous Coronary Intervention in Bifurcation Lesions. *Interv Cardiol* 2019;14:5-9.
3. Legutko J, Yamawaki M, Costa RA, Costa MA. IVUS in bifurcation stenting: what have we learned? *EuroIntervention* 2015;11(Suppl V):V55-8.
4. Yildiz BS, Cetin N, Gunduz R, Bilge A, Ozgur S, Orman MN. Effect of Coronary Thrombus Aspiration in Non ST Elevation Acute Coronary Syndrome Patients on Three-Year Survival- Does it add any Benefit? *Angiology* 2022;73:565-78.