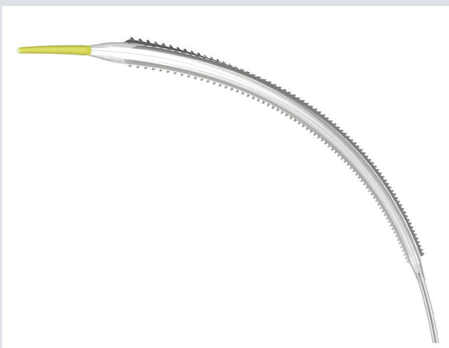
Cath Lab Digest

A product, news & clinical update for the cardiac catheterization laboratory specialist



CASE REPORT

Bilateral Lower Extremity Treatment With the Serranator PTA Serration Balloon Catheter

Antonis Pratsos, MD

A 77-year-old male presented with significant, bilateral peripheral arterial disease. He had a past medical history of coronary artery disease requiring a stent to the right coronary artery (RCA), hypertension, hypercholesteremia, and a previous myocardial infarction. His claudication (Rutherford classification 3) symptoms included cramping while walking, bilaterally, but with the right greater than the left. The treatment plan was to evaluate and treat the right leg with follow-up to evaluate, then treat, the left leg.

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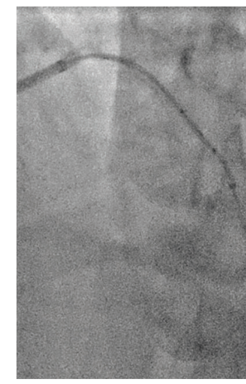
CALCIUM CORNER

Tips and Tricks for Guide Extension Catheter Usage With Intravascular Lithotripsy



CLD talks with Stephan H. Heo, MD, FACC, FSCAI.

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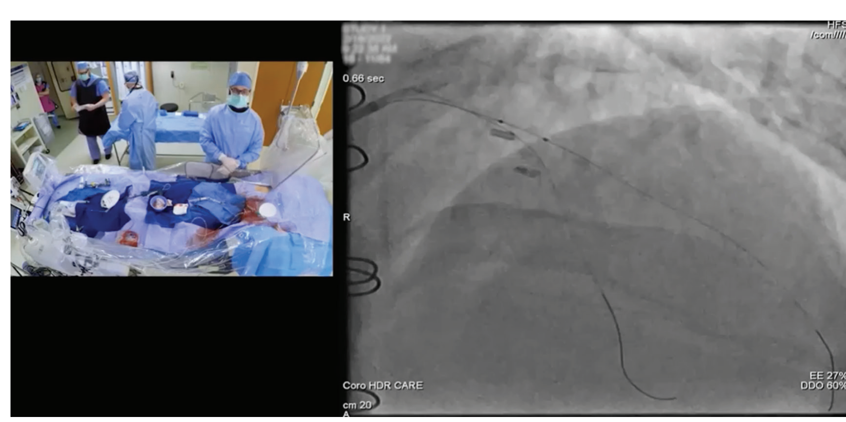
CASE SERIES

Maintaining Wire Position With a Single-Operator Technique Utilizing Glide Assist™ With Orbital Atherectomy During Advancement Through the Coronary Guide Catheter

Matthew G. Whitbeck, MD; Jeffrey W. Chambers, MD



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Maintaining Wire Position With a Single-Operator Technique Utilizing Glide Assist™ With Orbital Atherectomy During Advancement Through the Coronary Guide Catheter

Matthew G. Whitbeck, MD; Jeffrey W. Chambers, MD

Abstract

The utilization of coronary atherectomy continues to increase in modern percutaneous coronary intervention. To further improve safety and simplify delivery of the Cardiovascular Systems, Inc. (CSI) orbital atherectomy system, we present a technique utilizing the Glide Assist™ function for crown advancement through the coronary guide catheter to maintain wire position and provide a safe, single-operator option. Our series contains 33 patients who successfully underwent this technique without loss of wire position or device complications. The technique was compatible in a variety of arterial access locations and guide catheter French sizes. The ease and safety of this technique makes it a new standard option for delivery of the orbital atherectomy system to the target lesion.

The utilization of coronary atherectomy continues to increase in modern-day percutaneous coronary intervention (PCI), as operators treat an aging population with severe coronary calcification and multiple comorbidities.[1] The advantages of coronary atherectomy include better lesion preparation, improved stent delivery, stent expansion, and stent apposition. Disadvantages of coronary atherectomy include increased procedural times, slow or no-reflow, and coronary perforation.[1] The Cardiovascular Systems, Inc. (CSI) orbital atherectomy system (OAS) is the only FDA-approved treatment for severely calcified coronary lesions.[2,3] This device has been shown to improve acute and long term outcomes with low 30-day major adverse cardiac event (MACE) rates.[2,3] The safety and success of coronary atherectomy has been correlated with operator and hospital volume.[4] These procedures require careful technique to ensure proper outcomes. The coronary atherectomy procedure begins by delivering the device to the lesion for treatment.[3-5] To further improve safety, minimize wire loss, and simplify delivery of the OAS device, we devised a technique utilizing the Glide Assist™ function for crown advancement through the coronary guide catheter while maintaining wire position and allowing a safe, single-operator option.

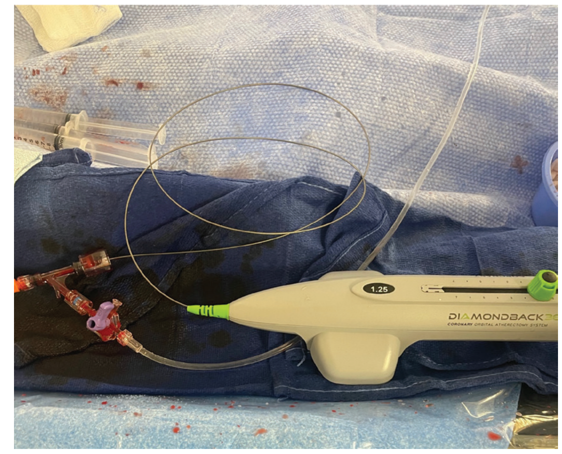
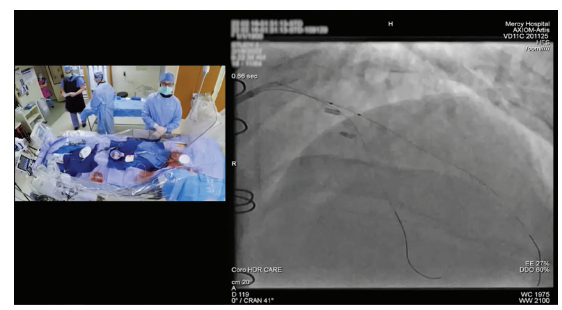


Figure 1. **The orbital atherectomy device crown has been inserted past the hemostatic valve and the device is in the Glide Assist™ mode, ready to be advanced.**



Video 1 (Available at cathlabdigest.com with the article). **Recorded live case, from start to finish, demonstrating the single-operator technique.**

Technique Description

Once the operator has positioned the OAS wire in the desired location, the device is set up per the manufacturer's instructions. The device is loaded on the wire and brought in front of the hemostatic hub; for this technique, our preference is a bloodless hemostatic valve: the Copilot (Abbott Vascular) or Guardian II (Teleflex). The brake is depressed and the device is tested on low speed. Then, the brake is released, and the device is advanced until the crown has passed the hemostatic hub and is just inside the guide catheter. This step can be done with or without assistance. Next, the brake is depressed, and the device brought forward so that it sits next to the guide (Figure 1). By depressing the brake, the wire is held in place while the device is repositioned on the table. The device is switched to Glide Assist mode and the brake is released. Under fluoroscopy, the device is then turned on and the crown is advanced through the coronary guide to the desired location in the coronary artery. While performing this technique, the assistant will monitor the back end of the wire, making sure it remains free and without table interaction. Once we are at the desired lesion location, the brake is depressed, and the device is switched back to the standard low setting (full case available, Video 1).

Case Series

Tables 1 and 2 summarize the baseline patient and procedural characteristics in this case series. The average age of our patients was 69.9 years old; the average ejection fraction (EF) was 53.1%. The most common presentation for treatment was angina, at 60.6% of our patients. All major coronary arteries were represented in the target treatment vessel, with the left anterior descending (LAD) coronary artery treated in 16/33 (48.5%) patients. Radial artery access was performed in 26/33 (78.8%) of patients and 26/33 (78.8%) of the cases were completed using a 6 French system. The single-operator Glide Assist technique was utilized in 100% of cases. There were no incidents of wire position loss. There were no complications involving delivery of the device or its removal through the coronary guide catheter. In this case series, there were no wire fractures, device malfunction, equipment loss or entrapment, occurrences of slow or no-reflow, or coronary perforation of the treatment vessel. In one case, a diagonal side branch was lost immediately after atherectomy and was not retrievable, resulting in a post procedural non ST-elevation myocardial infarction (MI); however, there were no clinical sequelae. All patients were successfully discharged home from their procedure or hospital stay.

Discussion

To our knowledge, this is the first large case series utilizing the Glide Assist technique feature on the OAS to maintain wire position and allow for a single operator to deliver the device through the coronary guide catheter. As the frequency of calcification and complex lesions increase in the cath lab, so will the need for atherectomy.[1] Complex, calcified lesions can be tortuous and difficult to wire. A number of these patients can have associated aortic/subclavian or iliac tortuosity, which makes delivery of atherectomy devices challenging. It can lead to wire loss and result in increased procedure time and possible harm to the patient. Our technique allowed for the maintenance of wire position and successful delivery of the orbital atherectomy device in 100% of cases. After device delivery, all patients underwent successful lesion treatment with no device-related complications and successful removal of the device without loss of wire position. The single-operator Glide Assist technique performed well in a 6 French system and multiple access sites.

Our case series demonstrates the technique's universal adaptability for operators whenever they

Table 1. Baseline Patient Demographics.

Patients	Age	Gender	Ethnicity	CKD	ESRD	DM	HTN	HLD	Smoker	Angina	Prior MI	Prior PCI	Prior CABG	EF (%)
1	72	Male	Caucasian	No	No	No	No	Yes	Yes	Yes	No	No	No	60
2	70	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	60
3	60	Male	Caucasian	No	No	Yes	No	Yes	No	Yes	No	No	No	50
4	71	Female	Caucasian	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	60
5	87	Male	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	45
6	64	Female	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	No	No	60
7	69	Male	Caucasian	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	35
8	51	Male	Caucasian	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	35
9	65	Male	Caucasian	No	No	No	No	Yes	Yes	Yes	No	No	No	60
10	80	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	60
11	63	male	Caucasian	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	60
12	75	Female	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	25
13	79	Male	Caucasian	No	No	No	Yes	Yes	No	Yes	No	No	No	60
14	50	Male	Caucasian	No	No	No	No	Yes	No	Yes	No	No	No	60
15	64	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	No	No	60
16	87	Male	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	55
17	85	Male	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	60
18	78	Male	Caucasian	No	No	No	Yes	Yes	No	Yes	No	No	No	60
19	86	Male	Caucasian	No	No	No	Yes	Yes	No	Yes	No	No	No	50
20	64	Male	Caucasian	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	60
21	65	Female	Caucasian	No	No	No	No	Yes	Yes	Yes	No	No	No	45
22	72	male	Caucasian	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	65
23	60	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	No	No	55
24	60	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	55
25	61	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	No	No	50
26	62	Female	Caucasian	No	No	No	Yes	No	No	Yes	Yes	Yes	No	60
27	69	Female	Caucasian	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	60
28	63	Male	Caucasian	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	55
29	64	Male	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	30
30	85	Female	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	57
31	76	Male	Caucasian	No	No	No	Yes	Yes	Yes	Yes	No	No	No	58
32	75	Male	Caucasian	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	55
33	77	Male	Caucasian	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	35

Age= years, CKD= chronic kidney disease, ESRD= end stage renal disease, DM= diabetes, HTN= hypertension, HLD= hyperlipidemia, MI= myocardial infarction, PCI= percutaneous coronary intervention, CABG= coronary artery bypass grafting, EF= ejection fraction.

Table 2. Baseline Procedural Demographics.

Patients	Indication for PCI	TVL	CTO	Access Site	Sheath size (French)	IVUS/OCT	MSD	COMPLICATIONS
1	Stable Angina	LAD	NO	FEMORAL	7	YES	NO	NO
2	Unstable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	YES D1 LOSS, Post MI
3	NSTEMI	LAD	NO	RADIAL	6	YES	NO	NO
4	NSTEMI	LAD	NO	FEMORAL	6	YES	NO	NO
5	Stable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
6	Stable Angina	RCA	NO	DISTAL RADIAL	6	YES	NO	NO
7	NSTEMI	LM	NO	DISTAL RADIAL	6	YES	YES	NO
8	Stable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
9	Unstable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
10	NSTEMI	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
11	Unstable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
12	NSTEMI	LAD	NO	FEMORAL	6	YES	YES	NO
13	Stable Angina	RCA	NO	DISTAL RADIAL	6	YES	NO	NO
14	Unstable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
15	Stable Angina	LAD	NO	DISTAL RADIAL	6	YES	NO	NO
16	Unstable Angina	RCA	NO	DISTAL RADIAL	7	YES	NO	NO
17	NSTEMI	CX	NO	DISTAL RADIAL	6	YES	NO	NO
18	NSTEMI	RCA	NO	DISTAL RADIAL	6	YES	NO	NO
19	Unstable Angina	RCA	NO	RADIAL	6	YES	NO	NO
20	Unstable Angina	RCA	NO	DISTAL RADIAL	7	YES	NO	NO
21	STEMI	RCA	NO	DISTAL RADIAL	6	YES	NO	NO
22	Unstable Angina	CX	yes	FEMORAL	8	YES	NO	NO
23	Stable Angina	RAMUS	NO	RADIAL	6	NO	NO	NO
24	Stable Angina	LAD	NO	RADIAL	6	YES	NO	NO
25	Unstable Angina	LAD,D1	no	RADIAL	6	YES	NO	NO
26	NSTEMI	RCA	NO	RADIAL	6	YES	NO	NO
27	Unstable Angina	CX	yes	FEMORAL	7	YES	NO	NO
28	NSTEMI	LAD	NO	RADIAL	6	YES	NO	NO
29	NSTEMI	LAD	NO	FEMORAL	7	YES	YES	NO
30	Unstable Angina	RCA	NO	RADIAL	6	NO	NO	NO
31	STEMI	RCA	NO	RADIAL	6	YES	NO	NO
32	Unstable Angina	CX	NO	RADIAL	6	YES	NO	NO
33	NSTEMI	CX,RAMUS	NO	FEMORAL	7	NO	YES	NO

TVL= target vessel lesion, CTO= chronic total occlusion, IVUS= intravascular ultrasound, OCT= optical coherence tomography, MSD= mechanical support device, LAD= left anterior descending artery, RCA= right coronary artery, CX= circumflex artery, D1= first diagonal artery, STEMI= ST elevation myocardial infarction, NSTEMI= non-ST elevation myocardial infarction

choose to use the OAS. Additional benefits include a short learning curve for the operator and their assistant, which allows for easier incorporation of OA into their practice. Technique limitations include the need to initially pass the burr through the hemostatic device, which typically requires the operator to have assistance. This need can be overcome by advancing the knob and bringing the orbital atherectomy crown into the beginning of the guide; however, this is an advanced technique and not typically performed. An additional limitation with this technique occurs in the setting of guide extension catheters. The Glide Assist technique is not recommended for use with 6 French guide extension catheters, due to crown interaction with the distal entrance and push rod; however, the technique has been performed successfully in 7 or 8 French guide extension catheters. If an operator does wish to utilize this technique in a 6 French guide extender, we recommend having the distal entrance of the guide extender at the beginning of the guide catheter, just past the hemostatic valve, manually advancing the crown fully into the guide extender, and then performing this technique. Once the crown is brought to the end of the guide catheter, just before entering the coronary ostium, depress the brake of the OAS system and then advance the guide extender to the desired position. Additional analysis of one of the guide catheters used during this study was performed. Both visual inspection and electron microscopy (EM) were performed (Figure 2). There was no visible damage identified, but on the EM, there were abrasions that occurred in the guide catheter during OAS advancement. However, we observed no clinical effect related to this finding.

Conclusion

This case series demonstrates the safety and efficacy of a simple technique to advance the OAS through the coronary guide catheter as a single operator, while maintaining wire position and preventing device complications. The ease and safety of this technique make it a new standard option for delivery of the OAS to the target lesion. ■

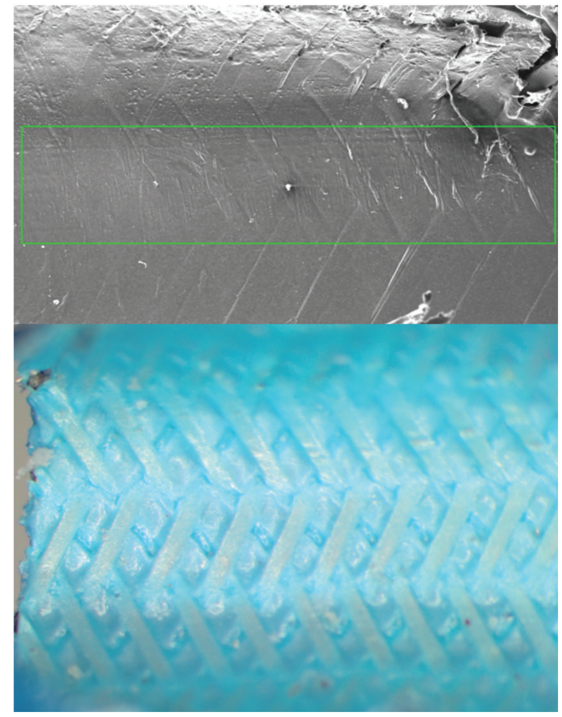


Figure 2. (Top) Guide catheter with the electron microscopy (EM) evaluation and (bottom) the corresponding visual analysis. The green box on the EM image demonstrates abrasions from the orbital atherectomy device, but no surface damage.

References

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Disclosures: Dr. Matthew Whitbeck reports he is a consultant/speaker for Cardiovascular Systems Inc. (CSI). Dr. Jeffrey Chambers is the Chief Medical Officer for CSI.

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