output is not completely supported by a ventricular assist device.

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REFERENCES

1. Weil BR, Konecny F, Suzuki G, Iyer V, Canty JM Jr. Comparative hemodynamic effects of contemporary percutaneous mechanical circulatory support devices in a porcine model of acute myocardial infarction. J Am Coll Cardiol Intv 2016;9:2292–303.

2. Burkhoff D, Sayer G, Doshi D, Uriel N. Hemodynamics of mechanical circulatory support. J Am Coll Cardiol 2015;66:2663–74.

3. Remmelink M, Sjauw KD, Henriques JP, et al. Effects of mechanical left ventricular unloading by Impella on left ventricular dynamics in high-risk and primary percutaneous coronary intervention patients. Catheter Cardiovasc Interv 2010;75:187–94.

Impella Retrieval: Redux

We were pleased to read "First Experience With Successful Percutaneous Retrieval of Retained-Fractured Impella Device" in *JACC: Cardiovascular Interventions* (1). Because temporary mechanical circulatory support devices are used with increasing frequency, we are likely to continue experiencing device-related issues.

We reported on a remarkably similar case 2 months prior: "Impella 5.0 Fracture and Transcatheter Retrieval" (2). The location of device fracture is different, highlighting the potential areas of weakness that should be considered by those implanting these devices. The technique we described for retrieval of the retained device is also used in the current report (1), validating our process as appropriate for this clinical scenario.

With rapidly increasing use of new technology, we are bound to discover new challenges such as reported here. Creative thinking will lead to innovative solutions as highlighted in these papers.

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REFERENCES

1. Saleh QA, Foster M, Abi Rafeh N. First experience with successful percutaneous retrieval of retained-fractured Impella device. J Am Coll Cardiol Intv 2017;10:e15–6.

2. Bhamidipati CM, Mathur M, Hira RS, McCabe JM, Pal JD. Impella 5.0 fracture and transcatheter retrieval. J Am Coll Cardiol Intv 2016;9:2568–70.

Angiographic Follow-Up in Patients With Coronary Artery Disease

Is There a Window to Be Definitively Closed?

We read with great interest the paper of Shiomi et al. (1) about the impact of angiographic follow-up (AFU) in patients undergoing percutaneous coronary intervention (PCI). The authors have to be congratulated for their effort to clarify a quite controversial theme. The main conclusion is that after a median follow-up of 4.6 years, no benefit in terms of the composite primary outcome (death, stroke, rehospitalization for myocardial infarction [MI] or heart failure) emerged for the AFU group, whereas repeated revascularization rates were higher compared with the clinical/ischemia-driven group.

As already stated in the editorial by Puri et al. (2), many points must be argued to better interpret these results. First of all, the study was not sufficiently powered to show significant differences between the 2 groups. The incidence of target lesion revascularization (TLR) was very low, probably favored by newer-generation drug-eluting stents and a strong compliance to optimal medical therapy as usual in randomized controlled trials (RCTs). In this setting, follow-up (FU) duration and population size were

JACC: CARDIOVASCULAR INTERVENTIONS VOL. 10, NO. 8, 2017
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probably not sufficient to show a difference even in the composite outcome. The decrease in repeated revascularizations in the AFU group compared with the clinically/ischemia-driven one after the first year from the index procedure supports our hypothesis. As the authors state in their discussion, most of the early angiographically proven restenosis later became clinically driven revascularization in the noninvasive FU cohort. In a longer FU, these data could determine a higher incidence of adverse cardiovascular events such as MI or acute coronary syndrome (ACS) caused by abrupt stenosis progression.

Furthermore, both the European and American guidelines (3,4) confine the possibility of an AFU to a low-powered and low-evidence level of recommendation (Class of recommendation IIb, Level of Evidence: C), referring particularly to high-risk patients, such as those with ACS and left main disease (LMD).

The proportion of patients enrolled with an ACS (30%, and just 20% with a MI admission diagnosis) was only a minority of the overall population. These data poorly reflect the real-life population and may limit the applicability of present results to the everyday catheterization laboratory practice. This subset of patients, considering the intrinsic instability of ACS disease and the emergency setting of primary PCI, could benefit from AFU of the index procedure. Another important issue to be argued is the lack of intravascular ultrasound data on coronary lesions. This information would help to understand the underlining mechanism of TLR so as to better focus the target of planned AFU.

Last, but not the least, a very small proportion of enrolled patients had LMD or chronic total occlusion lesions. In the subgroup analysis, a potential benefit, even if not significant, clearly emerged for these types of lesions. It is probably in this selected type of patients that we could see the strongest benefit in terms of lower cardiovascular events, using a planned AFU, especially patients with LMD, where promising results even at long-term FU have been demonstrated recently (5).

In conclusion, the work of Shiomi et al. (1) should not definitively close a window of opportunity for AFU in a selected population of patients undergoing coronary artery interventions, focusing on those with a more complex anatomy, particularly if the index procedure was performed in an ACS context. More data, with longer FUs, are needed to better clarify the usefulness of this strategy.

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REFERENCES

1. Shiomi H, Morimoto T, Kitaguchi S, et al., ReACT Investigators. The ReACT trial: Randomized Evaluation of Routine Follow-Up Coronary Angiography After Percutaneous Coronary Intervention Trial. J Am Coll Cardiol Intv 2017; 10:109–17.

2. Puri R, de la Torre Hernandez JM, Auffret V, et al. Routine surveillance coronary angiography post-PCI: should we ReACT and change our routine? J Am Coll Cardiol Intv 2017;10:118–20.

3. Levine GN, Bates ER, Blankenship JC, et al. 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines and the Society for Cardiovascular Angiography and Interventions. J Am Coll Cardiol 2011;58:e44–122.

4. Windecker S, Kolh P, Alfonso F, et al. 2014 ESC/EACTS guidelines on myocardial revascularization: the Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio- Thoracic Surgery (EACTS). Eur Heart J 2014;35:2541–619.

5. D'Ascenzo F, Iannaccone M, Giordana F, et al. Provisional vs. two-stent technique for unprotected left main coronary artery disease after ten years follow up: a propensity matched analysis. Int J Cardiol 2016;211:37–42.

REPLY: Angiographic Follow-Up in Patients With Coronary Artery Disease

Is There a Window to Be Definitively Closed?

We thank Bertaina and colleagues for their interest in our study evaluating the clinical impact of routine coronary angiography (CAG) after percutaneous coronary intervention (PCI) (1). As we stated in our paper, we agree with Bertaina and colleagues that our study was underpowered to make a definitive conclusion regarding the clinical impact of routine follow-up CAG after PCI, especially for high-risk patients such as those with left main disease, complex coronary artery disease (CAD), and acute coronary syndrome. We also agree with the importance of longer follow-up to detect the potential benefit of routine follow-up CAG.

Bertaina and colleagues stress potential benefits of routine follow-up CAG in patients with acute coronary syndrome. We think, however, that it remains