

# Interviews



**Samin Sharma and Emmanouil S. Brilakis** spoke with EMJ, discussing their career paths and delving into their ground-breaking research. They shared valuable insights from impactful publications and expressed their thoughts of the field.

**Featuring: Samin Sharma and Emmanouil S. Brilakis**



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**Q1** You are an investigator for the **Prospective Global Registry for the Study of Chronic Total Occlusion Intervention (PROGRESS-CTO)** trial. How might the research findings be implemented in clinical practice?

PROGRESS-CTO is a multicentre international registry of chronic total occlusion (CTO) percutaneous coronary interventions (PCI), with >12,000 procedures collected to date, and over 100 publications.

One of the most direct applications of the registry's findings to everyday practice is for evaluating the likelihood of success (using the Progress CTO score) and the risk of complications (using the PROGRESS complications scores) for each patient referred for CTO PCI. The average likelihood of success at experienced centres, such as those participating in PROGRESS-CTO, is approximately 85%, with about a 3% risk of complications. We also created an online calculator that allows an

estimation of the potential success and risk of a planned CTO PCI, that can facilitate discussions with the patient and their family, and planning for the procedure.<sup>1</sup>

**Q2** Please describe the top-line results from the **Plaque Regression and Progenitor Cell Mobilization With Intensive Lipid Elimination Regimen (PREMIER)** trial, and how these impact clinical practice.

The PREMIER trial randomised 160 patients with coronary syndrome without familial hyperlipidaemia after percutaneous coronary intervention to intensive lipid-lowering therapy (ILLT), comprising single LDL apheresis and statins versus standard medical therapy (SMT) with no LDL apheresis and statin therapy alone. The primary efficacy end point, percentage change in total plaque volume at 90 days by intravascular ultrasound, on average decreased by 4.81% in the ILLT group and increased by 2.31% in

the SMT group (difference of means:  $-7.13$ ; 95% confidence interval:  $-14.59-0.34$ ];  $P=0.0611$ ).

There was robust endothelial progenitor cell colony-forming unit mobilisation from baseline to 90 days in the ILLT group ( $P=0.0015$ ), but not in SMT ( $P=0.0844$ ).

### **Q3** Please describe your systematic, algorithmic approach for treating *de novo* and in-stent balloon undilatable lesions.

Intravascular imaging is critical for deciding how to treat balloon undilatable lesions. There are intravascular imaging criteria, using either intravascular ultrasound or optical coherence tomography, about which lesions are unlikely to respond to high-pressure balloon angioplasty with standard or plaque-modification balloons. In lesions that do not have these characteristics, high-pressure balloon inflation is performed using non-compliant or plaque modification balloons sized 1:1 with the target vessel. If high-pressure balloon inflation fails to expand the stent, as assessed by coronary angiography or intravascular imaging, intravascular lithotripsy is often done for short lesions, whereas orbital or rotational atherectomy is usually done for long lesions. Intravascular lithotripsy is preferred for in-stent lesions where orbital or rotational atherectomy is used as the last resort if all other approaches fail. The very high-pressure balloon can also be used in balloon undilatable lesions (*de novo* or in-stent), and laser with simultaneous contrast injection is sometimes performed in in-stent balloon undilatable lesions. Extraplaque lesion crossing is a complex and technically difficult procedure that can be used in either *de novo* or in-stent balloon undilatable lesions if other PCI approaches fail. If all PCI techniques fail, coronary bypass graft surgery can be considered. Our step-to-step approach to *de novo* and in-stent balloon undilatable lesions has been summarised; please see reference for further information on this algorithm.<sup>2</sup>

### **Q4** Could you discuss the evolving role of transradial access in chronic total occlusion percutaneous coronary intervention?

Radial access is increasingly used in CTO PCI with good outcomes. Two randomised trials (COLOR and FORT-CTO) showed similar technical

success with lower risk of complications. There has been significant increase in the utilisation of radial access for CTO PCI in the PROGRESS-CTO registry, and currently radial/femoral are the most commonly used access site combination. Both proximal and increasingly radial access are being used for CTO PCI.

### **Q5** Please highlight the clinical relevance of your 2022 case report, entitled 'Complications of Stent Loss During Treatment of a Heavily Calcified and Tortuous Chronic Total Occlusion'.

The key message of this report is that trying to retrieve a lost stent can be more time consuming and more dangerous than deploying or crushing the stent. In this report, snaring the stent and forcefully trying to remove it from the coronary artery led to a perforation requiring covered stent implantation.

### **Q6** Could you comment on the role of intravascular brachytherapy for treating in-stent restenosis?

In the USA, where coronary drug-coated balloons are not approved for clinical use, coronary brachytherapy is currently the preferred modality for treating recurrent in-stent restenosis (two or more stent layers) as it reduces the risk of restenosis without inserting another layer of metal. Brachytherapy is by no means perfect, with approximately 30% risk of target lesion failure after 2 years, and requires indefinite dual antiplatelet therapy. Coronary brachytherapy is currently available at few centres in the USA.

### **Q7** Please summarise the key take-home messages for interventionists from your 2022 article entitled 'Femoral or Radial Approach in Treatment of Coronary Chronic Total Occlusion: A Randomized Clinical Trial'.

The key message of the FORT-CTO trial is that radial access can be successfully used for CTO PCI without compromising the likelihood of success, while reducing the risk of vascular access complications.



### **Q8** Could you provide an overview of the supportive guidewire paradox and how this can be overcome in a clinical scenario?

Using a support guidewire, such as Grand Slam (ASAHI-INTECC, Seto, Japan), or HI TORQUE IRONMAN™ (Abbott, Abbott Park, Illinois, USA), is often used to facilitate equipment delivery, especially in tortuous and calcified vessels and when guide support is suboptimal. Sometimes, however, especially in vessels that are both tortuous and calcified, use of support guidewires may lead to wire bias, paradoxically hindering equipment delivery. Switching to a less supportive guidewire may provide a solution in such cases.

### **Q9** Could you explain how the 'power knuckle' facilitates entry into the extraplaque space for subsequent antegrade dissection and re-entry?

Power knuckle is a technique for advancing a guidewire into the extraplaque space by placing a microcatheter proximal to the proximal cap of a CTO. A balloon usually sized 1:1 with the target vessel is inflated across the tip of the

microcatheter, and a polymer-jacketed guidewire is advanced without rotation. The inflated balloon often helps to guide the wire into the extraplaque space, followed by extraplaque crossing of the CTO and re-entry distal to the distal cap.

### **Q10** Why might double-kissing (DK) crush be preferred over culotte when performing bifurcation stenting using an upfront two-stent strategy?

DK crush has better supporting data than culotte, including a randomised controlled trial (DKCRUSH-III) showing superiority of DK crush versus culotte. In DK crush, the wire position is always maintained in the main vessel, whereas in culotte the main vessel wire has to be removed and the vessel rewired. For both techniques, however, meticulous execution and confirmation of an optimal result is of critical importance. A well-performed culotte is superior to a poorly-performed DK crush, and vice versa. Excellent results can be achieved with either technique when performed in an expert way.

## Q11 Are drug-coated balloons a feasible alternative to drug-eluting stents in patients with *de novo* small-vessel coronary artery disease?

Drug-coated balloons are very promising for treating small vessels, as long as a good result can be achieved without significant dissection and excellent antegrade flow.

## Q12 In your opinion, should complex and high-risk PCI be offered to selected octogenarians and nonagenarians?

Yes! While we know that the risk of complications is significantly higher when performing PCI in octogenarians and nonagenarians, compared with younger patients, many of those elderly patients are very functional, and PCI could improve their quality and possibly quantity of life. A thorough discussion and explanation of the risks and benefits of the procedure is particularly important for this group of elderly patients.

## Q13 Finally, is there anything else that you would like to add?

Learning how to perform PCI, especially complex PCI, is a lifelong endeavour. Always striving to improve success and decrease the risk of complications is critical for achieving the best possible outcomes. With the proper training and practice, everyone can become better at performing PCI. We are currently exploring the road to mastery in the Sensei podcast, that interviews expert interventionalists from around the world. ●

### References

1. Coronary Chronic Total Occlusion (CTO) database. CTO case database. Available at: [www.ctomanual.org](http://www.ctomanual.org). Last accessed: 3 February 2023.
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3. Sensei Podcast. Episode Playlist. Available at: <https://www.youtube.com/playlist?list=PLrg6KBVL0GBoXUqzq62i2UUvFW0dkR7Wj>. Last accessed: 3 March 2023.

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