

# Antegrade Dissection and Reentry: Tools and Techniques

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## KEYWORDS

- Chronic total occlusions • Percutaneous coronary intervention • Antegrade approach
- Dissection/reentry • BridgePoint device

## KEY POINTS

- Antegrade dissection and reentry is an essential component of chronic total occlusion percutaneous coronary intervention.
- Previous techniques (STAR and its modifications) have been limited by low success rates and a lack of control over the site of reentry.
- The BridgePoint device was developed specifically for antegrade dissection and reentry and allows for efficient subintimal tracking and targeted reentry.
- Evolution of technique in conjunction with use of the BridgePoint device has resulted in an expansion of the anatomic subsets for which antegrade dissection and reentry can be successfully used.

## INTRODUCTION

Coronary artery chronic total occlusions (CTO) remain the most challenging lesion subset for percutaneous intervention. Despite a growing body of evidence relating to poor long-term outcomes in patients with CTOs<sup>1,2</sup> and favorable effects of revascularization,<sup>3,4</sup> attempt rates in the United States remain low.<sup>5</sup> Reasons for this include historical perceptions related to low success rates and prolonged procedure times, and operator anxiety about working in the coronary subintimal space.

Multiple advances in technique and technology, many of them originally developed by Japanese operators, have led to significant improvements in procedural success.<sup>6</sup> Guidewire and microcatheter advances, and technique iterations, have refined the strategies of antegrade wire escalation, retrograde wiring, and retrograde dissection reentry to allow reproducible outcomes in the hands of highly skilled operators.<sup>7</sup> However, this experience has not lent itself to widespread adoption internationally for

three reasons: (1) the lack of a simplified and teachable strategy for how to approach any given anatomic situation; (2) the lack of emphasis on time (and radiation) efficiency; and (3) no previously available option for consistently successful antegrade dissection and reentry.

The hybrid approach to CTO percutaneous coronary intervention (PCI) was developed in response to these unmet needs.<sup>8</sup> An algorithm based on anatomic lesion characteristics defines the primary and subsequent secondary (tertiary and so forth) strategies (Fig. 1). The approach requires familiarity with all four potential options for wire crossing (Fig. 2), and just as importantly a willingness to move quickly and seamlessly from one strategy to another if failure modes are encountered. Antegrade dissection and reentry is as integral a component of wire crossing in the hybrid approach as any of the other three (antegrade wiring, retrograde wiring, retrograde dissection and reentry), yet it has suffered from inadequate tools to consistently achieve high levels of success. The lack of wire and catheter control over both ends of the CTO

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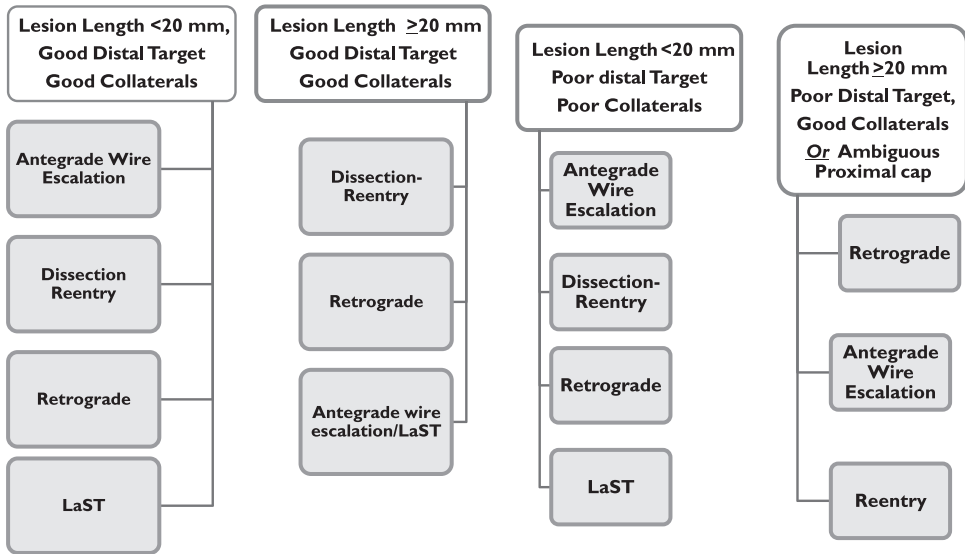


Fig. 1. The hybrid approach algorithm. Initial and subsequent strategies based on anatomic characteristics.

segment (as is available in retrograde dissection and reentry) has traditionally made successful reentry from the antegrade direction a challenge. The BridgePoint device (BridgePoint Medical,

Plymouth, MN, USA), which is the only coronary CTO product to have been developed specifically for gaining reentry into the true lumen from the subintimal space, has now allowed antegrade

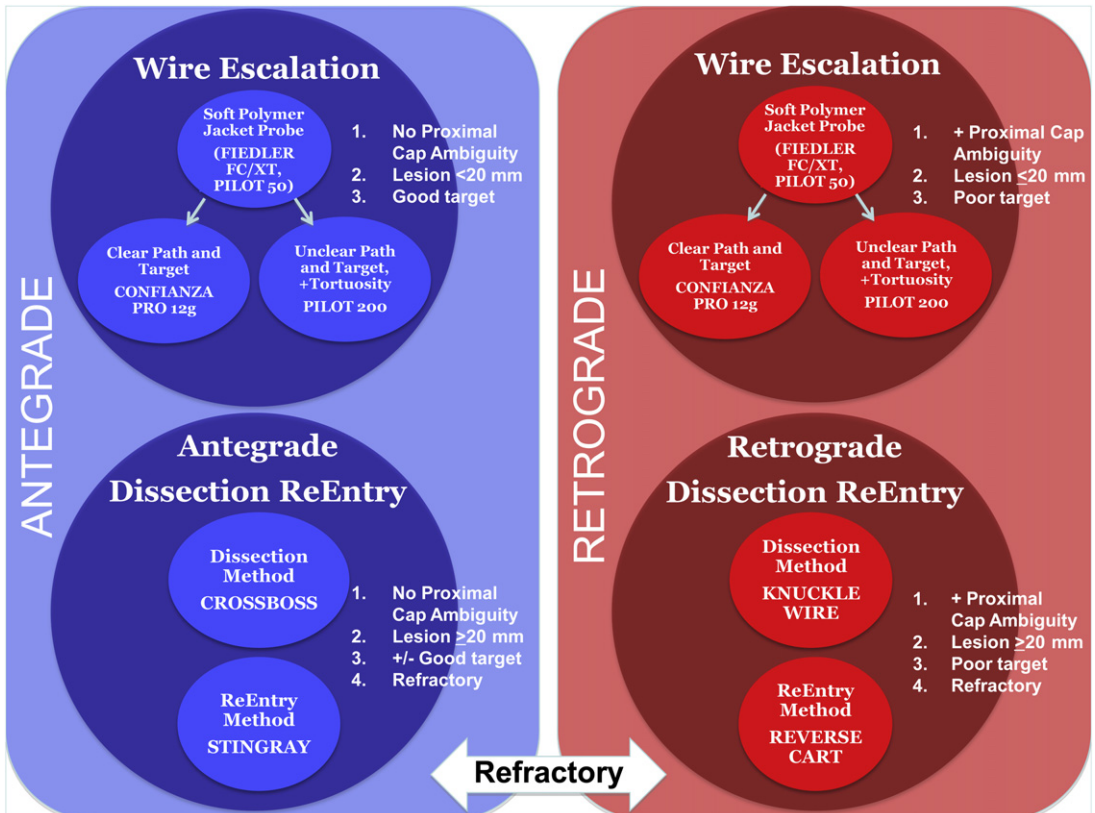


Fig. 2. The four crossing options for CTO intervention. Associated favorable anatomic indicators are listed to the right.

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