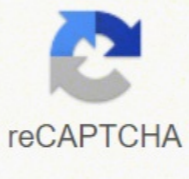




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Advances in Procedural Techniques - Antegrade

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Abstract: There have been many technological advances in antegrade CTO PCI, but perhaps most importantly has been the evolution of the "hybrid" approach where ideally there exists a seamless interplay of antegrade wiring, antegrade dissection re-entry and retrograde approaches as dictated by procedural factors. Antegrade wire escalation with intimal tracking remains the preferred initial strategy in short CTOs without proximal cap ambiguity. More complex CTOs, however, usually require either a retrograde or an antegrade dissection re-entry approach, or both. Antegrade dissection re-entry is well suited to long occlusions where there is a healthy distal vessel and limited "interventional" collaterals. Early use of a dissection re-entry strategy will increase success rates, reduce complications, and minimize radiation exposure, contrast use as well as procedural times. Antegrade dissection can be achieved with a knuckle wire technique or the CrossBoss catheter whilst re-entry will be achieved in the most reproducible and reliable fashion by the Stingray balloon/wire. It should be avoided where there is potential for loss of large side branches. It remains to be seen whether use of newer dissection re-entry strategies will be associated with lower restenosis rates compared with the more uncontrolled subintimal tracking strategies such as STAR and whether stent insertion in the subintimal space is associated with higher rates of late stent malapposition and stent thrombosis. It is to be hoped that the algorithms, which have been developed to guide CTO operators, allow for a better transfer of knowledge and skills to increase uptake and acceptance of CTO PCI as a whole.

Keywords: Antegrade dissection re-entry, chronic total occlusion, knuckle wire, CrossBoss catheter, Stingray balloon.

INTRODUCTION

Recent advances in the field of chronic total occlusion (CTO) percutaneous coronary intervention (PCI) have resulted in success rates of greater than 80% being reported in unselected and complex populations in centers with CTO PCI specific experience [1]. This compares favorably with historical data where success rates between 50 to 75% [2-5] were described. Whilst there have been developments in devices and techniques, a more fundamental change has been the evolution of a "hybrid" approach to procedural strategy, with a central tenet of using all feasible techniques (antegrade wiring, retrograde wiring, antegrade dissection re-entry or retrograde dissection re-entry) to achieve procedural success in the most efficient and expedient fashion.

Recent studies have demonstrated the benefits of CTO PCI in alleviation of stable angina [6], as well as improvement in left ventricular function [7], quality of life [1] and in long-term survival [6]. Nonetheless, rates of percutaneous revascularization for CTOs remain low, with the presence of a CTO remaining both a strong predictor of referral for coronary bypass surgery (CABG) of medical therapy. Indeed, only 10-15% of CTOs are treated with PCI [8] and there is slow uptake of the newer techniques, including retrograde or antegrade dissection re-entry. Contributors to this low attempt rate include: skepticism regarding clinical benefit;

operator inexperience, particularly with the newer techniques; a perceived greater risk of complications; and limitation of time and resources.

This review will focus on advances in antegrade procedural strategy.

A. IMAGING

1. Angiographic Assessment

A renewed Focus on Dual Injections

Detailed angiographic assessment is a critical part of the pre-procedural assessment. For successful antegrade CTO PCI, one must penetrate the proximal cap, traverse the occluded segment and distal cap before entering the distal true lumen. Although some of these segments may be defined by pre-procedure angiographic review, more information will be gleaned from dual injections (antegrade and contralateral) performed at the time of the CTO PCI [1]. Such injections, when performed properly on the appropriate magnification setting and without panning, allow identification of collateral supply as well as assessment of both occlusion length and the quality of the distal vessel.

A Detailed Assessment of Collateral Filling Patterns

Definition of the presence and type of collateral supply is important not just to facilitate potential retrograde access but also to define any antegrade collateral contribution to distal flow, which may potentially be compromised during antegrade PCI attempts (either through antegrade dissection or deliberate branch occlusion with anchor balloons).

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Quad Dominance-Ineffective Methods

Stretching -
Trying to Coach People Through These Points - Fix without coaching
Bracing Core Can Cause Incorrect Glute Firing Pattern which Increase Quad Problems and Recruitment
Quad Dominance can Lead to Sport Hernia Issues(long Term) and Groin Pulls(short Term)



Direct Effects in Sports RPR Breathing

Reset Has Caused

• 3 Times Stronger Core Retention (at 90 Seconds) 3 Times

• After RPR Breathing Reset Some worked 10x 10x

• Army Ranger, Strong 12 Hours Intervals For couple Years - Short 10 Hours (Post RPR)

• My Real Address Has Moved From San Francisco to Pennsylvania

• Very Hot

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Perhaps more troubling, sales of Take-Two's NBA basketball game slipped dramatically in units and in dollar terms from the year-ago level as the company attempted to raise prices on the game. But if Wellington was betting that the time was ripe to get out of Take-Two shares, other investors believe that the time has come to get in. But the pain didn't stop there. However, the company's recent sales have been disappointing, raising the possibility that it could miss earnings estimates for its current quarter. And last week came word from research group NPD that retail sales of the company's games in September fell 44% from last year. Take-Two Interactive (TTWO) - Get Take-Two Interactive Software, Inc. Just in time for a possible holiday-season turnaround, Take-Two is releasing a slew of new games, including a new version of its hot Grand Theft Auto - dubbed Liberty City Stories - for Sony's (SNE) - Get Sony Corp. Assuming the law is not overturned in court, retailers could be barred from selling Grand Theft Auto to minors. "That wouldn't be good for Take-Two," he says, adding that there always seems "to be a cloud over Take-Two, whether they deserve it or not." While Liberty City Stories might be a hit, the relatively small user base of PSPs mean that the company's take from the game is likely to be limited, says one buy-side analyst who asked to remain anonymous. "There's big upside if you get it right," he says. "I think that's something investors are rightfully concerned about," says the analyst, whose firm has been in and out of Take-Two shares in recent months. And like other video-game companies, Take-Two faces potentially poor results in the near term as it invests in games for the next generation of consoles. In contrast, shares of Electronic Arts and Activision are trading at 29 and 25 times expected earnings, respectively, for their fiscal years that begin in April. 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As part of the launch, the company warned that it is delaying two anticipated launches: a version of the Grand Theft Auto: San Andreas for Japan and a new game game Maton That would mark only the last stretches for a company that is being drunked. throughout.

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