CASE REPORT

Coronary perforation with tamponade successfully managed by retrograde and antegrade coil embolization

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In recent years, retrograde approach for chronic total occlusions has rapidly evolved, enabling a higher rate of revascularization success. Compared to septal channels, epicardial collaterals tend to be more tortuous, more difficult to negotiate, and more prone to rupture. Coronary perforation is a rare but potentially life-threatening complication of coronary angioplasty, often leading to emergency cardiac surgery. We report a case of a retrograde chronic total occlusion revascularization through epicardial collaterals, complicated by both retrograde and antegrade coronary perforation with tamponade, and successfully managed by coil embolization.

Keywords: Chronic total occlusion, Percutaneous coronary intervention, Coronary perforation, Tamponade, Coil embolization

Introduction

The prognostic benefits of chronic total occlusion (CTO) revascularization are well-recognized today [1,2]. However, despite the development of equipment and techniques [3], CTO percutaneous coronary intervention (PCI) remains challenging, with a lower success rate and a higher rate of periprocedural complications than non-CTO lesions [4]. The retrograde approach, particularly via septal channels, can improve recanalization success rates. Although epicardial collaterals in experienced hands may also represent an efficient option, their use is associated with a higher risk of complications [5].

Coronary perforation is a rare, but potentially life-threatening complication of PCI, with an incidence ranging from 0.1% to 0.5% [6]. As the conventional treatment of such a complication,

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consisting of reversal of anticoagulation and prolonged balloon inflation, is associated with high rates of death, myocardial infarction and need for emergency surgery, other strategies such as covered stent use and coil embolization have recently emerged, showing better outcomes [7].

We report a retrograde CTO revascularization case through epicardial collaterals complicated by perforation with tamponade and successfully managed by both retrograde and antegrade coil embolization.

Abbreviations

CTO	chronic total occlusion
D1	first diagonal
DES	drug-eluting stent
IABP	intra-aortic balloon pump
LAD	left anterior descending
LCx	left circumflex
PCI	percutaneous coronary intervention
RCA	right coronary artery

Case report

An 84-year-old ex-smoker and dyslipidemic male, with a history of pacemaker implantation for third degree atrioventricular block, was admitted for cardiogenic shock one hour after chest pain onset. The electrocardiogram showed an ST depression in lateral leads with Q wave in antero-septal leads. The 2-D echocardiogram revealed an impaired left ejection fraction (35%) with a global hypokinesia. A coronary angiography was performed with intra-aortic balloon pump (IABP) support showing a sub-occlusion of proximal dominant left circumflex (LCx) (Fig. 1A), a proximal occlusion of left anterior descending (LAD) and a tight stenosis of the second segment of a minor right coronary artery (RCA) giving septal and epicardial collaterals to LAD (Fig. 1). According to the clinical setting,

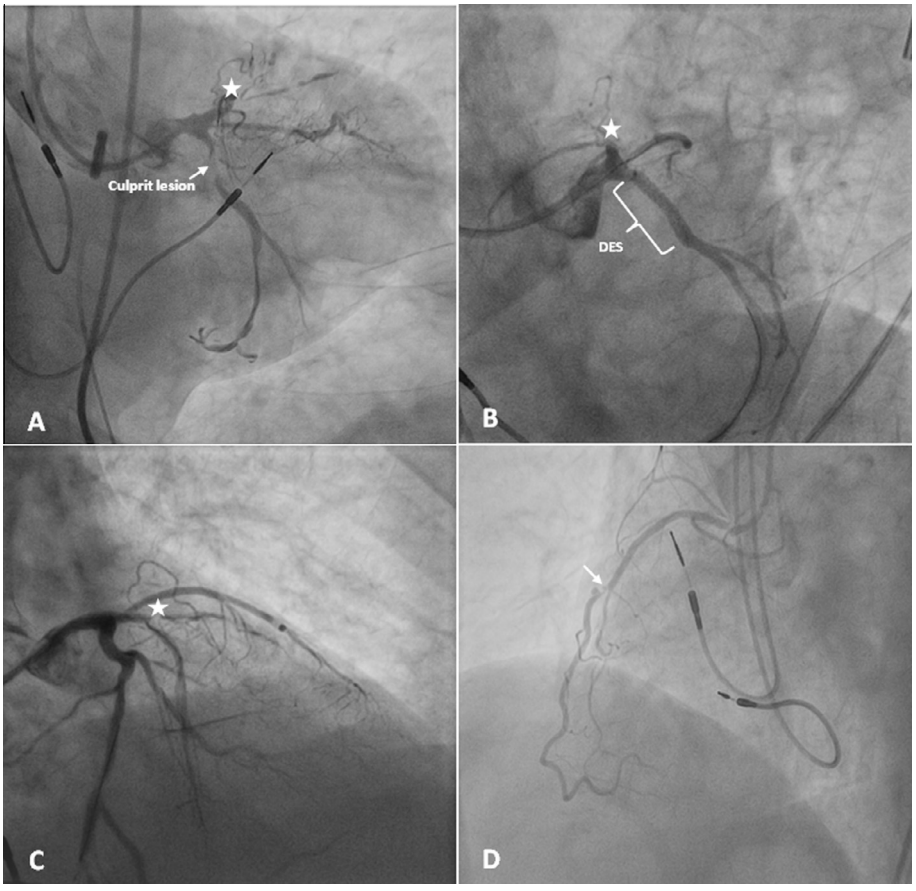

Figure 1. Coronary angiography. (A) Right caudal view showing a thrombotic sub-occlusion of proximal dominant LCx (arrow), and a proximal CTO of LAD. (B) Left caudal view after DES implantation in proximal LCx with good angiographic result. (C) Right cranial view after LCx PCI showing the LAD CTO with side branch at the proximal cap and blunt stump. (D) Left anterior oblique view showing a tight stenosis (arrow) of the second segment of a minor right RCA. Abbreviations: CTO = chronic total occlusion; DES = drug eluting stent; LAD = left anterior descending; LCx = left circumflex; RCA = right coronary artery; PCI = percutaneous coronary intervention. The star shows the proximal cap of LAD CTO.