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PERCUTANEOUS TREATMENT OF A CHRONIC TOTAL OCCLUSION IN AN ANOMALOUS RIGHT CORONARY ARTERY: A RUPTURE PAVED THE WAY FOR NEW INSIGHTS

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Rational: Percutaneous recanalization of coronary artery chronic total occlusion (CTO) has historically been technically challenging but through the development of dedicated wires and microcatheters, the improved skills of highly experienced operators and the adoption of new sophisticated strategies to guide procedural planning, great strides have been made. With increased use of non-invasive imaging, the diagnosis of anomalous aortic origin of coronary artery (AAOCA) is increasing and the association of anomalous origin and atherosclerotic disease is becoming a more important topic. PCI in an anomalous coronary artery is difficult, particularly with CTO, due to technical complexities, from engaging the coronary ostium to delivery of hardware through the vessel.

Technical resolution: We report a rare case of AAOCA chronic total occlusion. A 40-year-old Caucasian man was referred for invasive coronary angiography (ICA) due to typical chest pain and positive myocardial scintigraphy. ICA demonstrated CTO of an anomalous right coronary artery (ARCA) originating from the left side of the ascending aorta with an interarterial course. There was no lesion in the left coronary artery. During the procedure, unexpected rupture of the coronary artery occurred after dilatation with a small balloon at low pressure. The complication was handled implanting a first stent in the ruptured tract with long inflation (5 min). After the deployment the effusion disappeared and four additional stents were implanted to cover the dissection. The patient was clinically stable and asymptomatic; two days later he was discharged.

Clinical implications: Coronary artery perforations are rare but life-threatening procedural complications that are usually caused by predisposing anatomical and procedural factors. A 2 mm diameter balloon inflated at 14 atm in a 3.5 mm diameter artery causing perforation is inexplicable, even in a CTO procedure. Nine cases of ARCA CTO have been reported in the literature, three of which had major complications. Based on this complication, we hypothesized that the wall of the artery could be fragile due to histopathological alterations and we issue a warning on the risk of complications during complex percutaneous coronary intervention of these arteries.

Perspectives: Based on this assumption, could histological alteration of the arterial wall play a role in the pathophysiology of ARCA malignancy? Future autopsy studies focused on the analysis of the arterial wall of the patient affected by sudden death with this anomaly are needed to confirm this hypothesis.