

Percutaneous treatment of a CTO in an anomalous right coronary artery: a rupture paved the way for new insights



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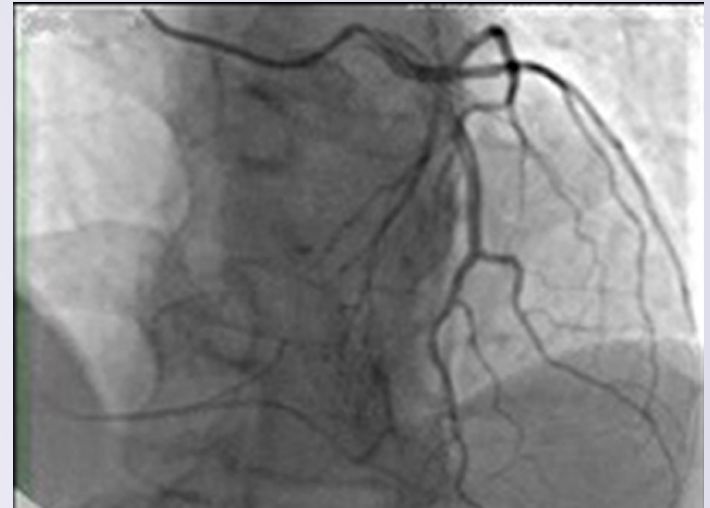


Medical history

- Caucasian man, 40 years old
- Without any remarkable risk factors
- Several-month-history of angina (CCS 2)
- EKG: minor right bundle branch block (RBBB)
- Echo: FE 60%, no abnormal wall motion, well functioning valves
- Myocardial scintigraphy: moderate reversible perfusion defects involving the inferoposterior wall area

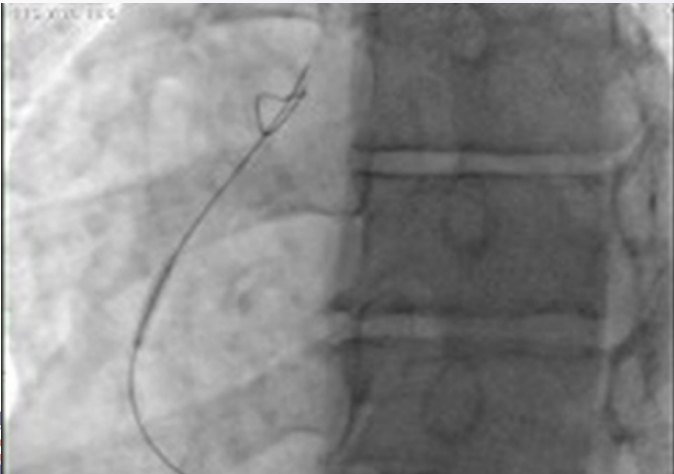
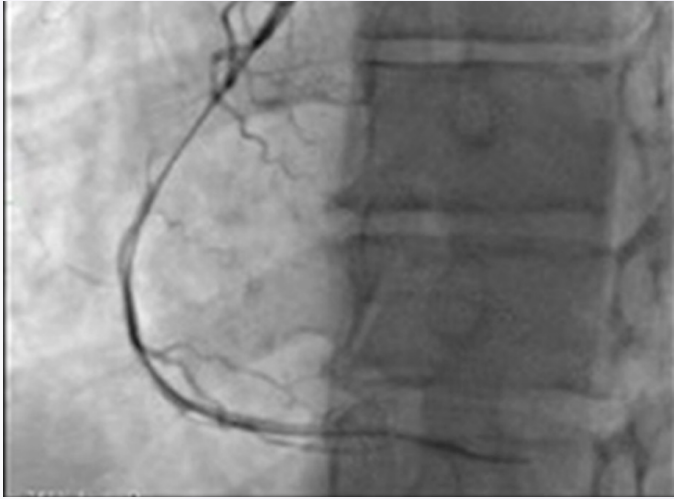
CORONARY ANGIOGRAPHY

- The left coronary artery did not exhibit significant stenosis; there was Rentrop III collaterality towards the right coronary artery (RCA).
- The RCA has an anomalous origin on the left side of the ascending aorta and chronic total occlusion (CTO) in the proximal atrioventricular tract.

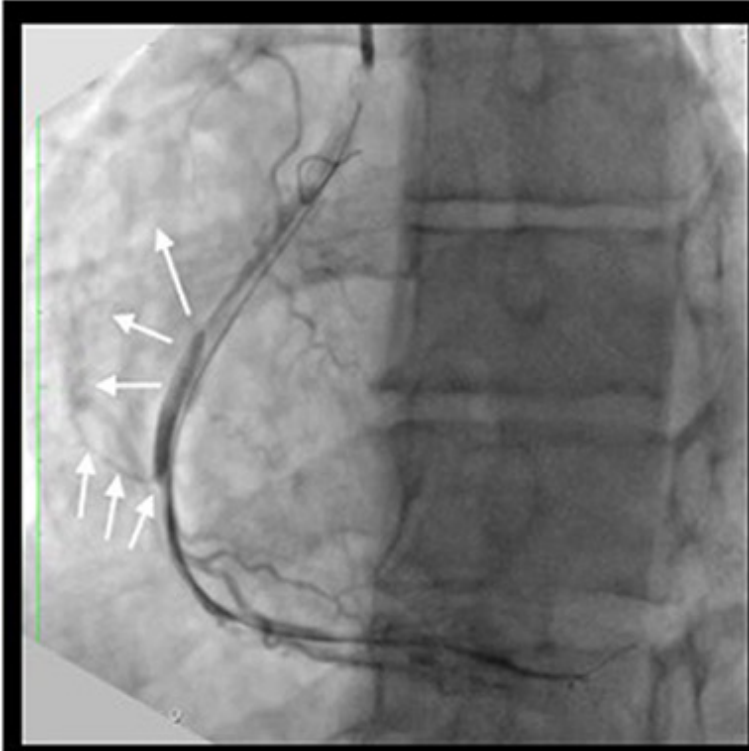


CTO PROCEDURE in the same session

- The occlusion was crossed with a tapered polymeric guidewire supported by 1.8 Fr microcatheter. Predilatation with 1.5 x 12 mm compliant ballon was performed. Good anterograde flow was restored
- A second dilatation with a NC 2,5 x 15 mm ballon at 14 atm was performed.



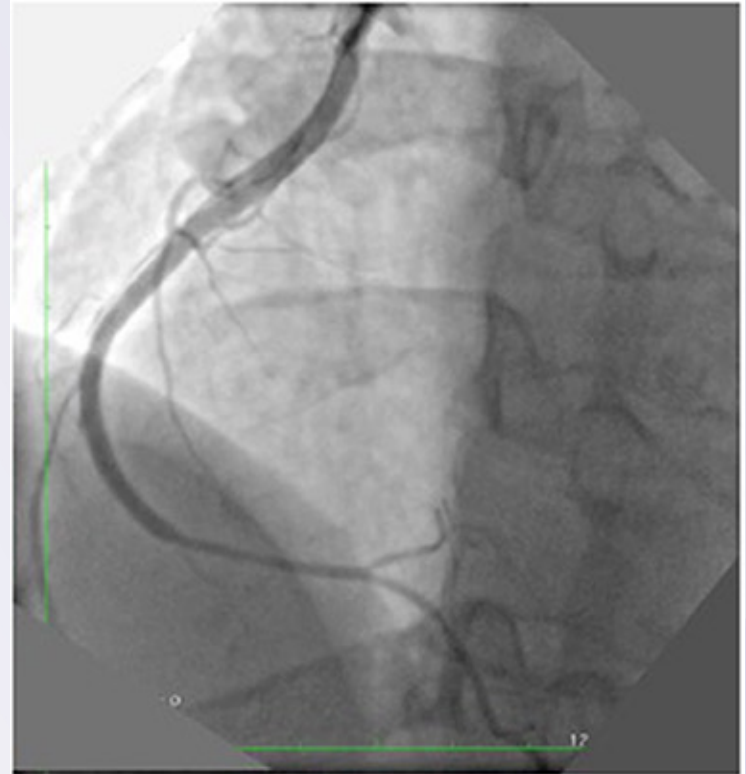
Procedural complication

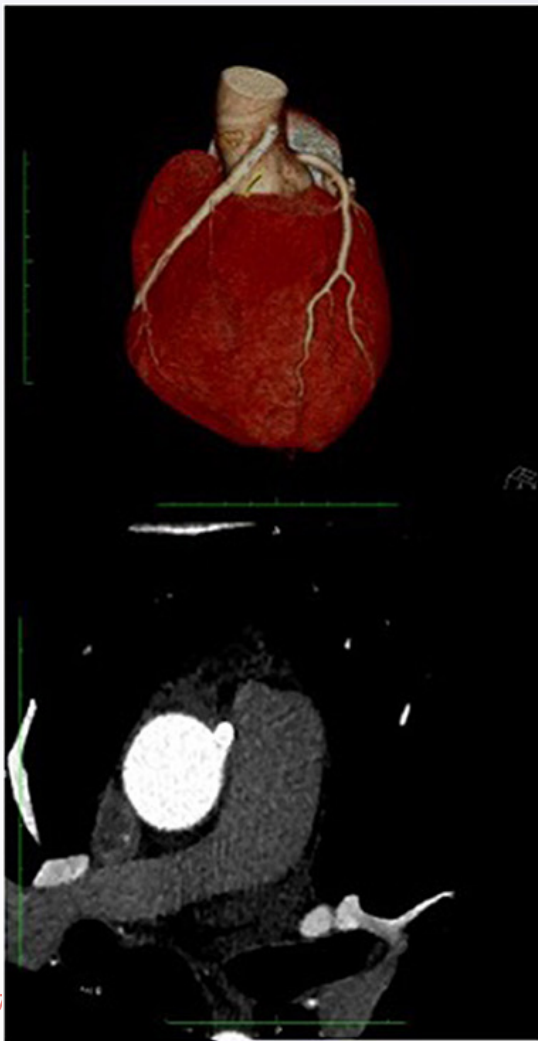


- After CTO dilatation the patient experienced chest pain and the angiography showed coronary Ellis II perforation and diffuse type D dissection.

Post pci final result

- A first stent was implanted in the ruptured tract with long inflation (10 min). After the deployment the effusion disappeared. 3 additional stents were implanted to cover the dissection. The final angiography showed a good result.
- Echo showed negligible pericardial effusion. The patient was clinically stable and asymptomatic. Troponin levels remained stable on two occasions. Two days later he was discharged.

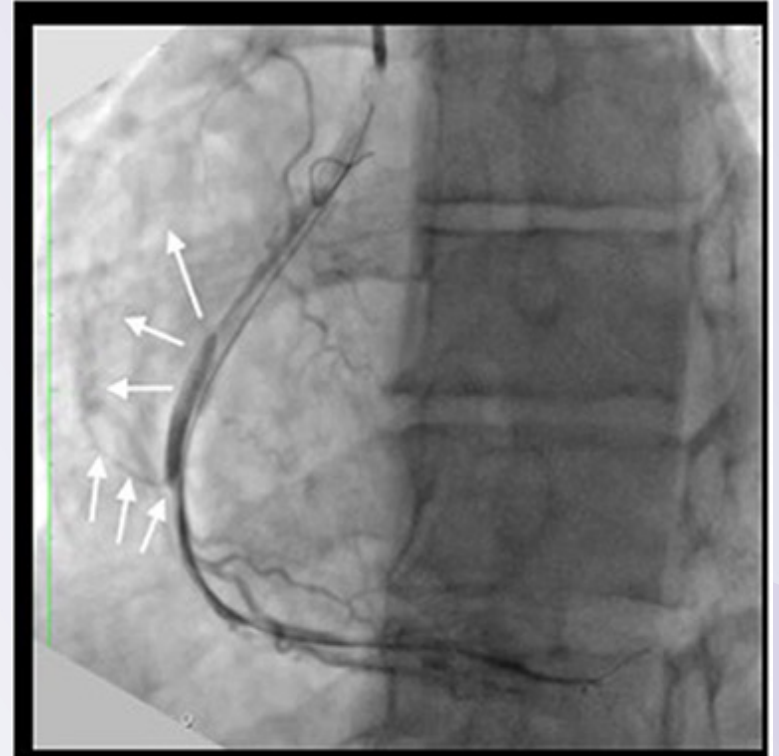
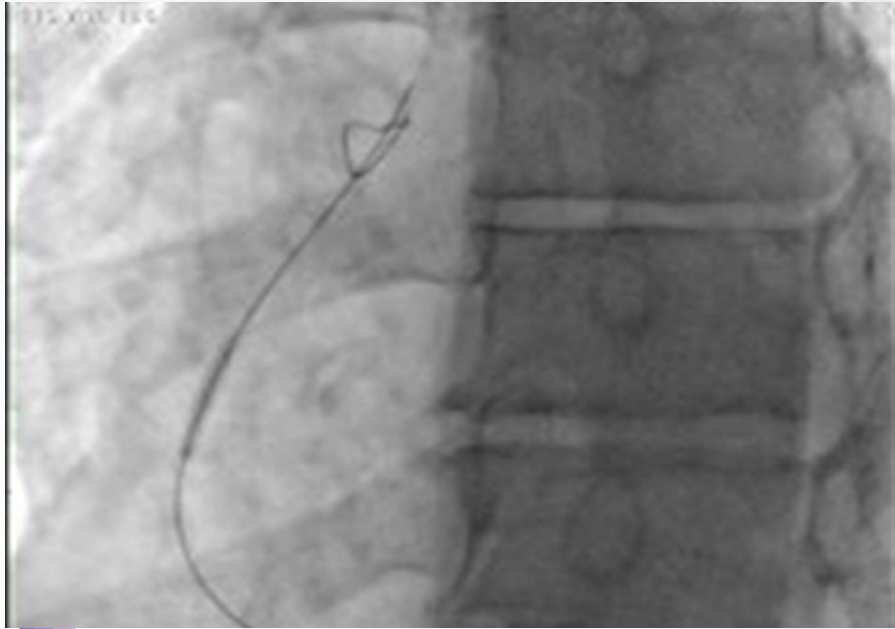




Coronary computed tomography

- The anomalous antero-left high origin of the RCA 17 mm from the sinotubular junction was confirmed. CTA scan showed the angled ostium and interatrial course, about 2 cm between the aorta and pulmonary trunk, with modest effusion (10 mm).
- An anomalous course with acute angulation may favor the complication but there could also be a histopathological explanation.

how is it possible for A 2 mm diameter balloon inflated at 14 atm to cause a perforation of an artery 3.5 mm in diameter?



Anomalous right coronary artery (Arca) cto procedures in literature

Cases	Age/sex	Technique used	Origin of the RCA	Site of occlusion	Complications
Kaneda et al. (45)	66 y/M	Antegrade	Left sinus	Proximal atrioventricular tract	None
Fang et al. (47)	74 y/M	Antegrade	High anterior	Proximal atrioventricular tract	Cusp dissection
Abdou and Wu (27)	58 y/M	Antegrade	Left sinus	Proximal atrioventricular tract	Aorto-coronary dissection
Porwal et al. (44)	71 y/F	Antegrade	Left sinus	Proximal atrioventricular tract	None
Senguttuvan et al. (43)	49 y/M	Antegrade	Left sinus	Proximal atrioventricular tract	None
Gasparini et al. (46)	65 y/M	Retrograde	Left sinus	Proximal atrioventricular tract	None
Yamada et al. (42)	43 y/M	Retrograde	Left sinus	Ostial	None
Young et al. (48)	68 y/M	Antegrade	Left sinus	Proximal atrioventricular tract	None
Patra et al. (26)	58 y/M	Antegrade	Left sinus	Proximal atrioventricular tract	None
Our case	40 y/M	Antegrade	High anterior left aorta	Proximal atrioventricular tract	Dissection and perforation

- On 9 cases of ARCA CTO reported 3 had major complications.
- A common tract of occlusion, the proximal atrioventricular part of the artery, has been reported.

conclusions

- PCI in an anomalous coronary artery is difficult, particularly with CTO. Only nine cases of CTO procedures in an anomalous right coronary artery have been reported in literature, three of which had major complications.
- We hypothesize that unexpected perforation could be explained by structure fragility of the artery and we issue a warning on the risk of complications during complex percutaneous coronary intervention of ARCA-CTO.
- Finally, could histological alteration of the arterial wall play a role in the pathophysiology of ARCA malignancy?

Thank you for your attention!

