



A challenging calcified coronary revascularization
performed with traditional and innovative techniques

Conflicts of interests disclosure:

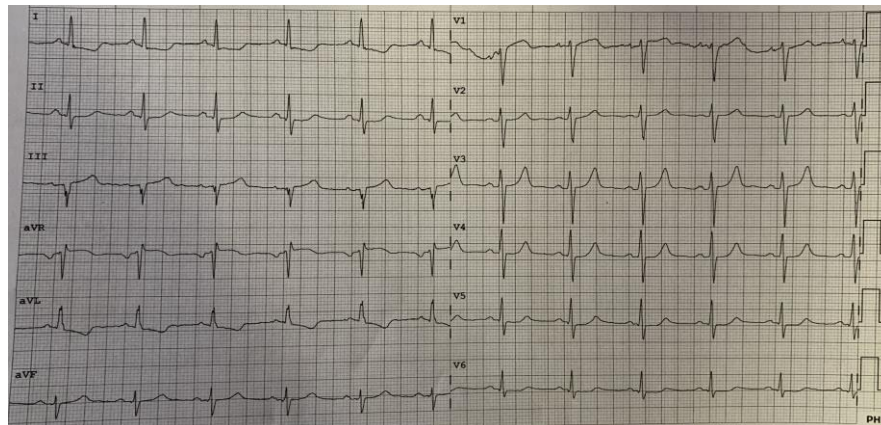
None

Clinical Case

54 year old man hospitalized in cardiology ward for low effort angina

History:

- previous bypass grafts (2018): left mammary artery → anterior descending artery; sequential saphenous vein graft → obtuse margin artery and posterior descending artery from right coronary
- obliterating peripheral artery disease (2016): left tibial angioplasty and drug eluting balloon
- end stage renal disease on hemodialysis treatment till 2012 (left radial arteriovenous fistula)
- insulin dependent type 2 diabetes



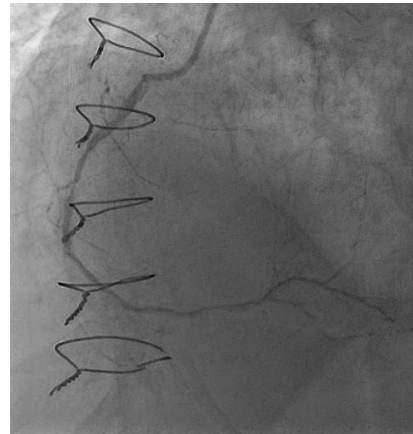
Coronary and Graft anatomy

Right femoral access 6F; diagnostic catheters JL 4 - JR 4 - Mammary - AR 1 (Cordis)



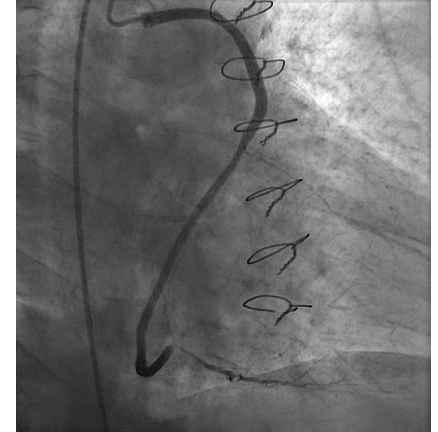
Left coronary
severe calcific trivalvular stenoses

Internal mammary → anterior descending
graft patency



Right coronary
severe calcific stenoses

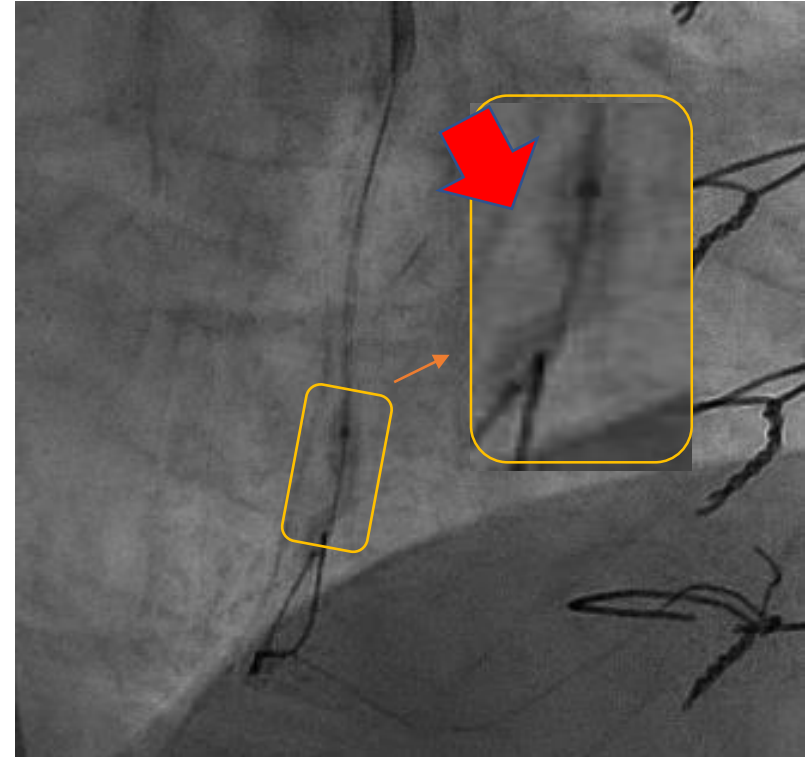
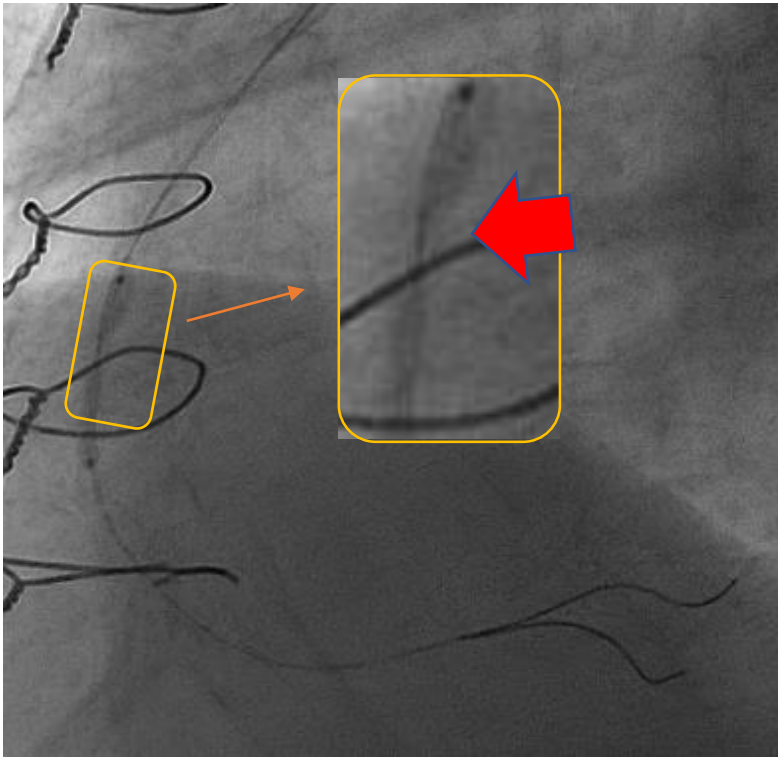
Venous graft → posterior descending of right
coronary artery graft patency, critical
anastomosis stenosis



In consideration of the complexity of left coronary lesions and patency of arterial graft for anterior descending artery, right coronary angioplasty was planned

Traditional angioplasty: high pressure balloon dilatation

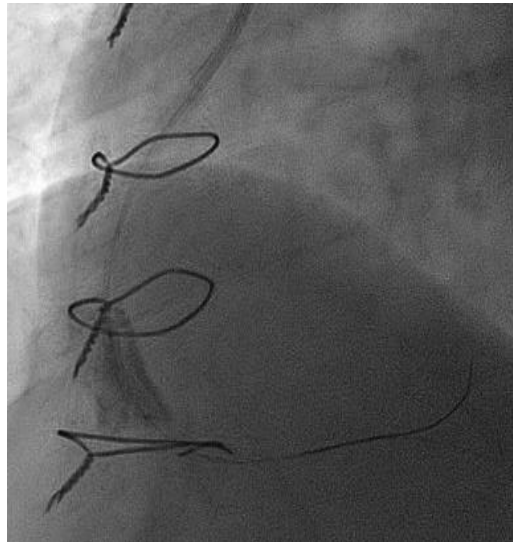
Guide catheter JR 4.0 6F (Cordis), two Ahsai Sion blue guidewires



Multiple predilatation attempts with Euphora (Medtronic) 2.5 x 20mm semi compliant balloon and Accuforce (Terumo) 2.5 x 20 mm – 3.0 x 20 mm non compliant balloons to 22 atm

- Evidence of severe calcified unexpandable lesion with «dog boning effect» (red arrow)

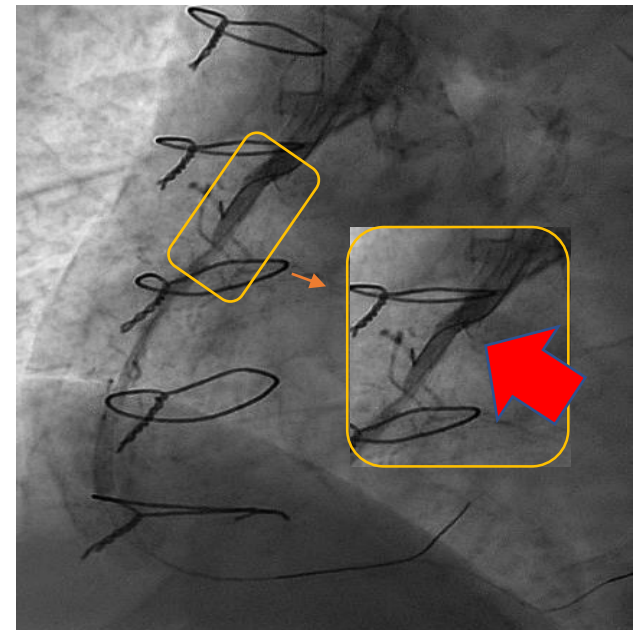
Unexpected compli- cance: coronary fissuration



Unexpected compli- cance occurred with evidence of contrast medium leak: coronary fissuration (type III – cavity spilling)

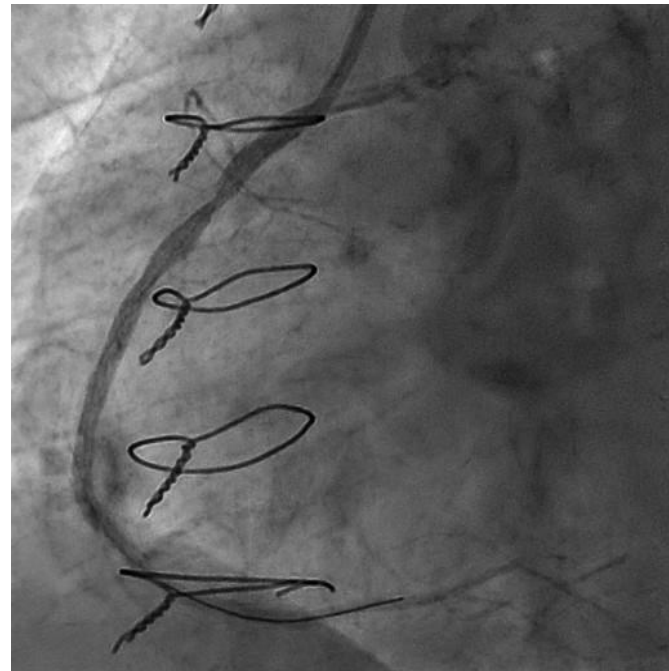
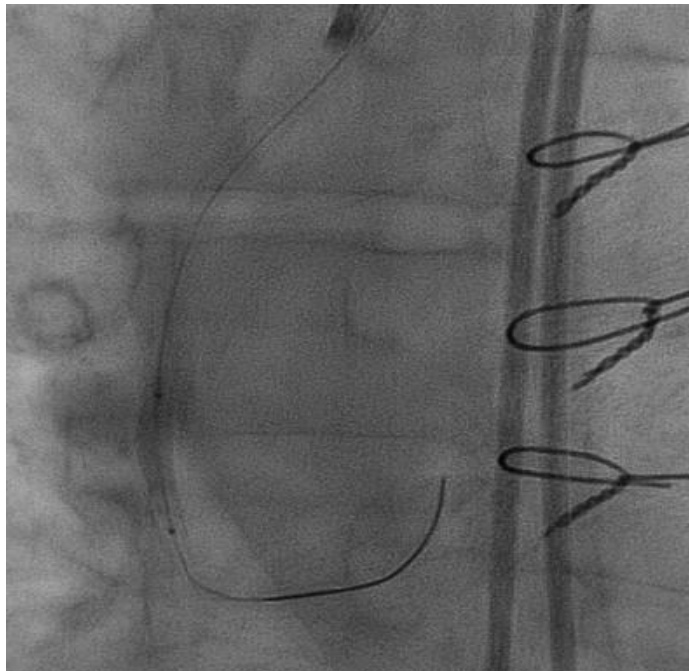
Prompt balloon inflation to stop hemorrhage and gain of contralateral left femoral access for ping-pong technique (JR 4.0 6F Cordis guide catheter).

Second wire could not advance because of extensive retrograde coronary dissection (red arrow)



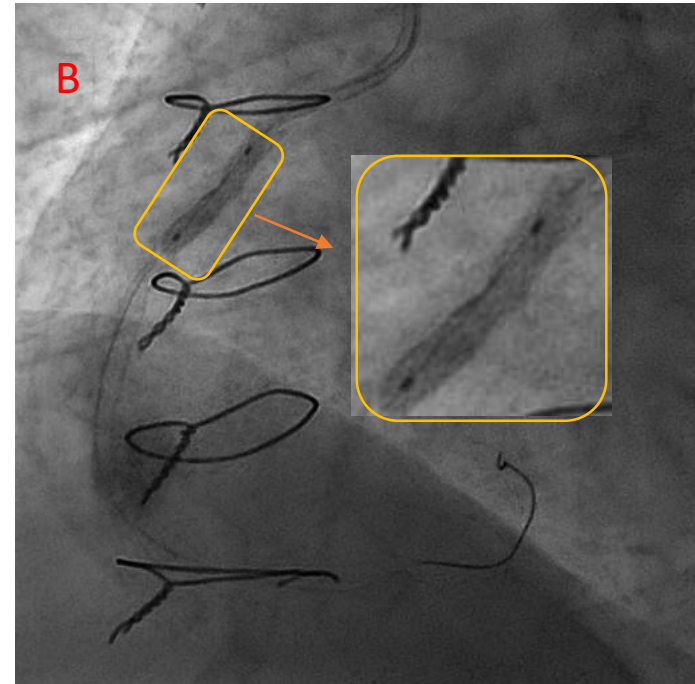
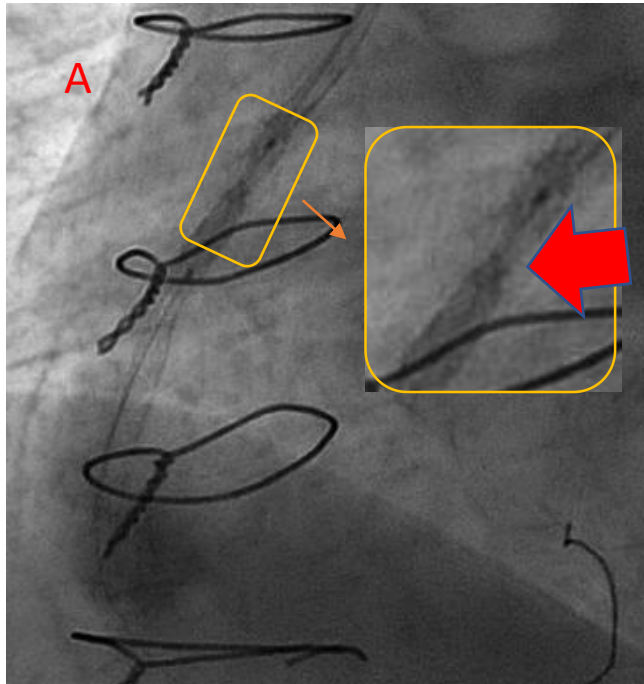
PCI and stent of right coronary artery

- A 3.5 x 16mm Bentley BeGraft covered stent was deployed on the site of the coronary leak through the first guide catheter
- After adequate monitoring and assessment of hemodynamic stability, 3.0 x 38 mm and 3.0 x 22 overlapping Resolute Onyx (Medtronic) DES were implanted on medio-proximal right coronary artery



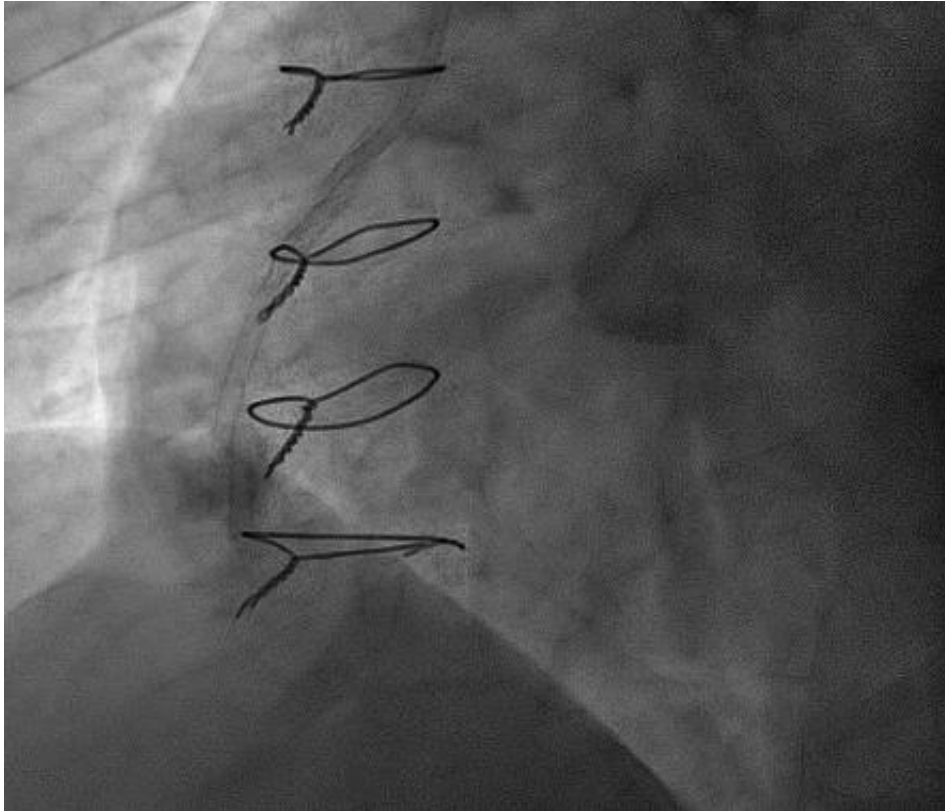
Postdilatation and Intravascular Litotripsy

- Accuforce (Terumo) 3.0 x 15 mm balloon dilatation for stent optimization, evidence of underexpansion with «dog boning effect» (A)



- Intrastent litotripsy with Shockwave (Shockwave medical) 3.0 x 12 mm balloon. 4 x 10 litotripsy waves were erogated with resolution of underexpansion (B)

Final result



Positive result of right coronary angioplasty, TIMI 3 flow and absence of leaks. An echocardiography demonstrated absence of pericardial effusion. The hospital stay and 1 month follow-up was unremarkable.

Conclusions

1. Revascularization of severe calcified lesions is challenging and it carries a greater risk of adverse technical and clinical outcome
2. Coronary fissuration is one of the most frequent complication of traditional high pressure balloon angioplasty
3. Intravascular lithotripsy is a innovative technique that could be effective in severely underexpanded stent due to a heavily calcified plaque
4. However, there is no established experience on optimization of underexpanded stent with intravascular lithotripsy over calcified lesions. DisruptCAD III will evalutate efficacy and safety (Am Heart J 2020;225:10-8.)