CORONARY ARTERY RUPTURE: SEALING WITH A HANDMADE MICROCOIL

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CORONARY ARTERY RUPTURE

- Incidence 0.1-3%
- Classification by Ellis
  - Type I
  - Type II
  - Type III: extravasation through a frank perforation (> 1 mm)
    - Spilling into the cavity:
      - Tamponade
      - Ventricular chamber
  - Management
    - Long balloon inflation
    - Covered stent/Mesh stent
    - Material embolization
CASE

- 64 years old man, with CTO very proximal of the LAD and significant stenosis of the proximal LCX
- Left dominant, PDA was from the LCX
- He underwent 2 stage PCI. The first procedure was on early March 2012 and a 4 x 23 mm Drug Eluting Stent 4 x 23 mm inserted from the LM to proximal LCX
LM-LCX:DES
4 x 18 mm
The second procedure was performed on July 23rd, 2012.

Retrograde approach was performed. Single access from left groin.

The CTO could be successfully crossed and 3 DES were deployed at the LAD.
CASE CONT’D

- BP dropped to 60/45 mmHg, diaphoresis
- Tachycardia
CASE

- Pericardiocentesis using echo-guided (400 cc)
- Auto transfusion around 1000 cc
RETROSPECTIVE

Distal guidewire migration could cause perforation?
WHAT WAS HAPPENING AND WHAT SHOULD WE DO

- Wire can cause perforation even from the proximal part of septal branch
- There were dual supplied (from LAD and from PDA-LCX)

Closure of the perforation can be achieved by embolization of some material in the exit points from both of dual supplied arteries
WHAT SHOULD WE DO NEXT?

- Ballon Inflation at LAD, LCx or both
- Deploy cover stent
  - Where to deploy?
- Deploy micro-coil: distal LCx + septal branch?
- Surgery including CABG
Balloon inflation at only LAD

Balloon inflation at distal LCx
Balloon inflation at both of LAD and OM.

Hemodynamic deterioration

Still have major leakage!!
Grade 3 coronary perforation

Hemodynamically unstable?
- Yes: Pericardiocentesis, cardiopulmonary resuscitation +/- IABP as necessary
- No: Covered stent implantation

Prolonged balloon inflation
- Yes: Evidence of continued contrast extravasation despite prolonged balloon inflation or intolerance to prolonged balloon inflation?
  - Yes: Evidence of continued contrast extravasation?
    - Yes: Postdilatation of covered stent
      - Further covered stent implantation
      - Prolonged balloon inflation +/- IABP support
      - Coil embolization, if feasible
      - Surgical repair of perforation +/- CABG
    - No: No further treatment
  - No: No further treatment
- No: Distal coronary perforation or covered stent undeliverable
  - Prolonged balloon inflation with IABP support
  - Coil embolization, if feasible
  - Surgical repair of perforation +/- CABG

Heparin or GPIIb/IIIa administered?
- Yes: Heparin reversal +/- platelet transfusion as necessary
- No: No further treatment
WHAT SHOULD WE DO NEXT

- We did not have ready micro-coil and covered stent on site
- Surgical ➔ need to prepare team
PREPARING HANDMADE MICROCOIL
2 hand-made microcoils
After the Cook’s microcoil available 4 hrs later → put another 2 coils

An other Cook’s micro-coil
Follow up

- Discharged after 3 days
- F-up 1 week after: showing minimal pericardial effusion
- Treatment: Methylprednisolone 3x16 mg
- F-up 2 week later: no pericardial effusion
CONCLUSION

- CAP can occur due to wire. This complication can cause tamponade lead to catastrophic event when managed properly.
- Pericardiocentesis should be performed promptly and echo-guided maybe easier.
- In performing CTO retrograde approach, bleeding from the perforation can be supplied by dual arteries and it should be taken into consideration.
- Perforation in small vessel can be managed using embolization from several material eg. coiling, subcutaneous fat, autologous blood clot, etc.
- Distal tip of coronary spring wire could be a choice for emergency hand-made coil when the commercial coils are not readily available.