Mechanical and Circulatory complications of ACS. Clinical case based scenarios.

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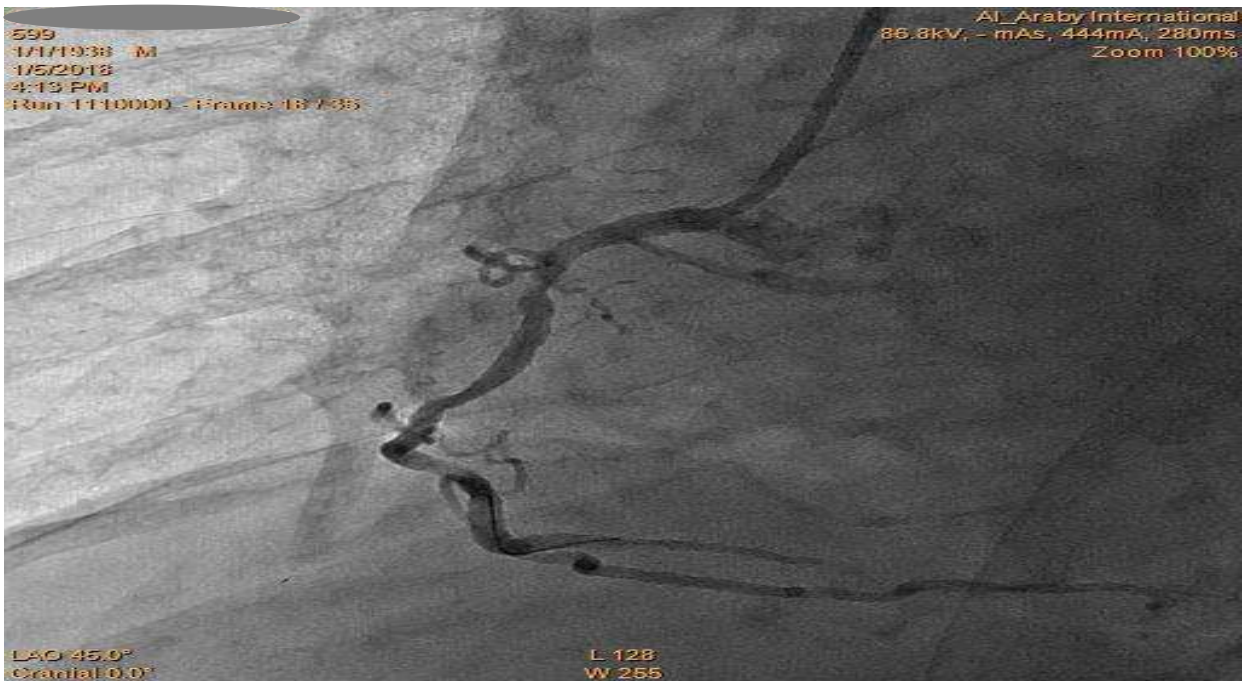
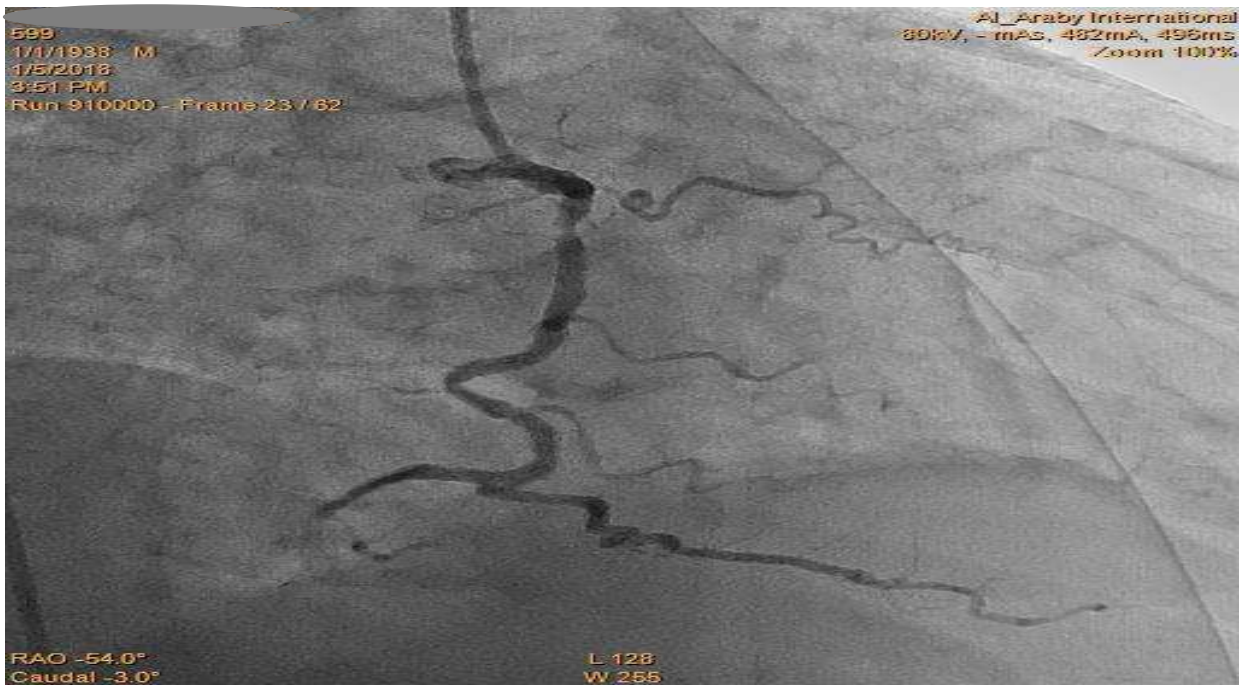
Case 1.

- Male patient 83 years old ,
- HTN,
- DM,
- Presented with acute inferior MI, 3 hours after first onset of typical chest pain ,
- PPCI was planned to be done for him ,
- Bed side labs were as follows :
- +ve troponin I
- CK-MB= 149

- Serum creatinin=1.6mg/dl.
- HBG=10.1gm/dl
- INR,PT,PC=normal.
- Written high risk consent from the patient's relatives for risk of CIN and renal dialysis was approved .
- Total amount of dye was near to 100ml for the whole procedure.
- Direct stenting of proximal RCA was done with good distal run off and TIMI III flow.
- Bid side Echo was LV function =55%, No mechanical complications.





CCU course:

- Day 1. patient was hemodynamic stable .
- Day 2-3. rising serum creatinin was observed reaching to 3.3mg/dl and K^+ = 5.5mequal/dl, low urine out put ,lung congestion ,patient ventilated.
- Day 4. ECG evidence of AV block .
- Day 5. Patient became hemodynamically unstable , temporary pacemaker was fixed , with hemodynamic support as B.P became lower than 90/60.
- Day 6-7.situation was stationary but labs of infection and sepsis was rising with hemodynamic dependant on circulatory supports and ventilation, blood cultures were withdrawn and antibiotics were given.
- Day 9. renal functions were worse than before and a nephrologists decided to do haemodialysis session, trials for weaning from temporary pacemaker but rhythm was complete HB, decision to do permanent pacemaker was taken and fixed.
- Follow up echocardiography was little bit border line LV function.
- Patient kept in that situation for another 5 days of diagnosis of sepsis and circulatory shock till he died.

Discussion :

The incidence of CIN in patients older than 60 years has been variously reported as 8%-16%. It has also been shown that in patients with acute myocardial infarction (MI) who undergo coronary intervention, **age of 75 years or older is an independent risk factor for CIN.**

Mortality :

Patients who **require dialysis have a considerably worse prognosis**, with a reported rate of **35.7% in hospital mortality** (compared with 7.1% in the non dialysis group) and a 2-year survival rate of only 19%.

Risk stratification scoring systems:

Mehran et al developed a scoring system based on points awarded to each of the following multivariate predictors [27] :

- Hypotension = 5 points
- Intra-aortic balloon pump (IABP) use = 5 points
- CHF = 5 points
- SCr >1.5 mg/dL = 4 points
- Age >75 years = 4 points
- Anemia = 3 points
- Diabetes mellitus = 3 points
- Contrast volume = 1 point for each 100 mL used

Risk categories by total calculated score, CIN rates, and requirements for dialysis were as follows:

Low risk (score of ≤5): CIN rate 7.5%, dialysis in 0.04%

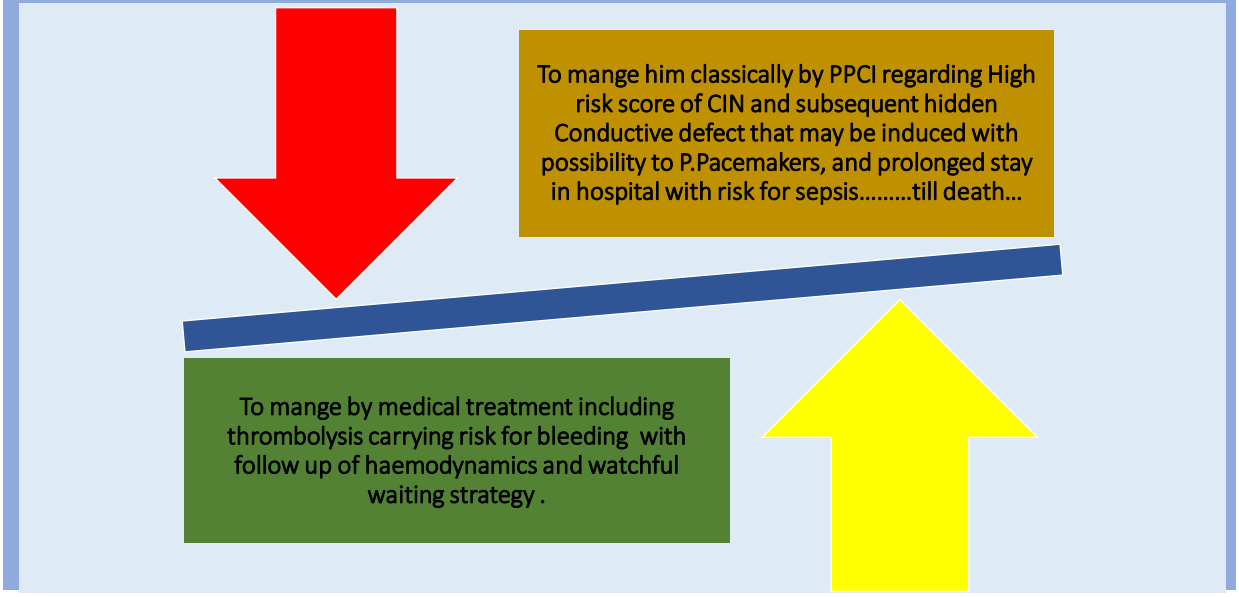
Moderate risk (score of 6-10): CIN rate 14%, dialysis in 0.12%

High risk (score of 11-15): CIN rate 26.1%, dialysis in 1.09%,

Very high risk (score of ≥16): CIN rate 57.3%, dialysis in 12.6%.

In our case calculated risk score for CIN and dialysis :was 15-20 with CIN rate 57.3%, dialysis in 12.6%.

So in such clinical case scenario what was the best to do for him????



Case 2:

- A female sex 69 years old.
- Hypertensive.
- Not diabetic.
- No history of previous CVS or CAD.
- Vague history of Recent myocardial infarction (anterior) since 5 days before admission to our hospital with thrombolytic administration, she was referred as the patient still complaining from persistent chest pain and instability of blood pressure.
- Labs revealed elevations of cardiac markers both CK-MB and Troponin I.
- Renal function was good Creatinine=0.8mg/dl.
- ECG showed persistent elevation of St-t wave in anterosptal leads .
- Bed side Echo reveals very distinguishable apical anteroseptal and apical segmental thinning out with hypercontarctile basal parts , overall LV systolic function was about 35%.

CCU course of the case :

By the night of first day admission the patient became hemodynamically unstable

- with drop of the mean arterial pressure < 40 mmHg by invasive assessment ,
- patient was on maximum support of vasopressors ,
- electrical instability started to be noticed on monitoring e.g. paroxysmal AF ,
- more deterioration of blood pressure ,
- and sluggishness of urine output ,
- patient's consciousness became deteriorated .

Bed side Echo did not reveals any differences from the initial one.

ECG : new added minor st-t wave changes in chest leads and AF over the initial ECG.

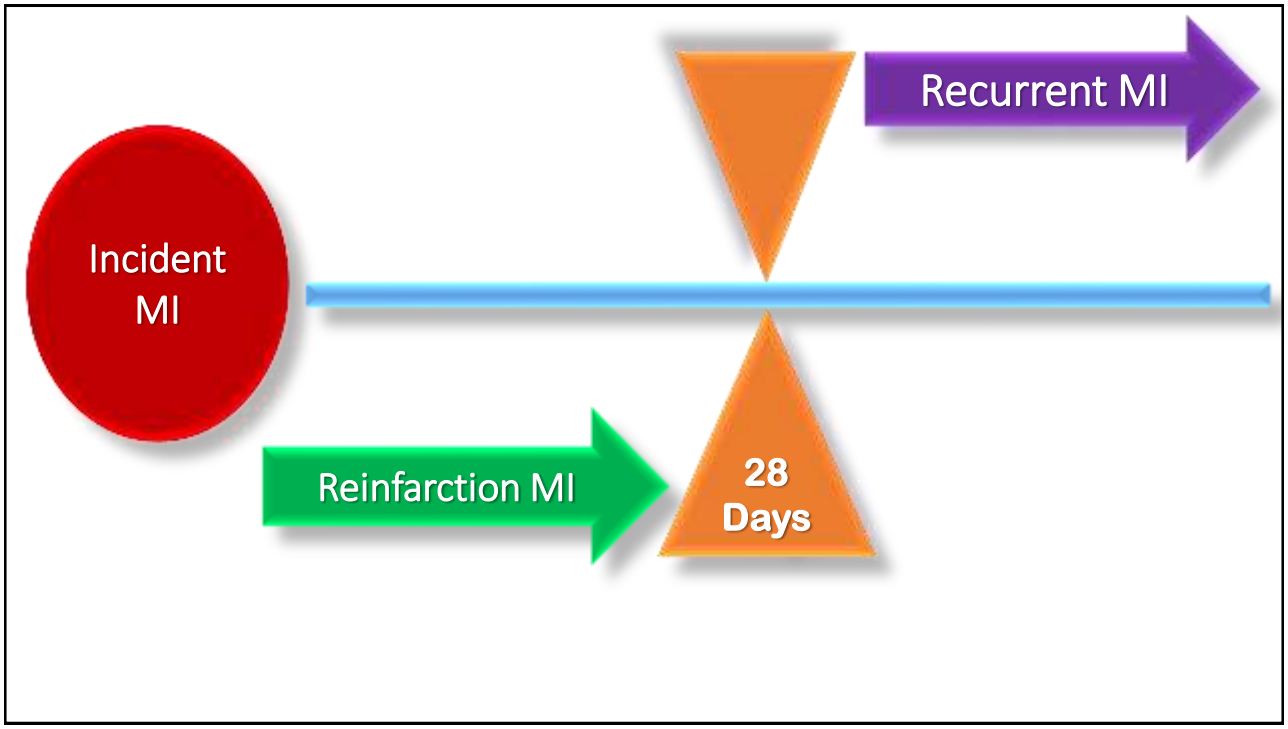
What could I do ??!!

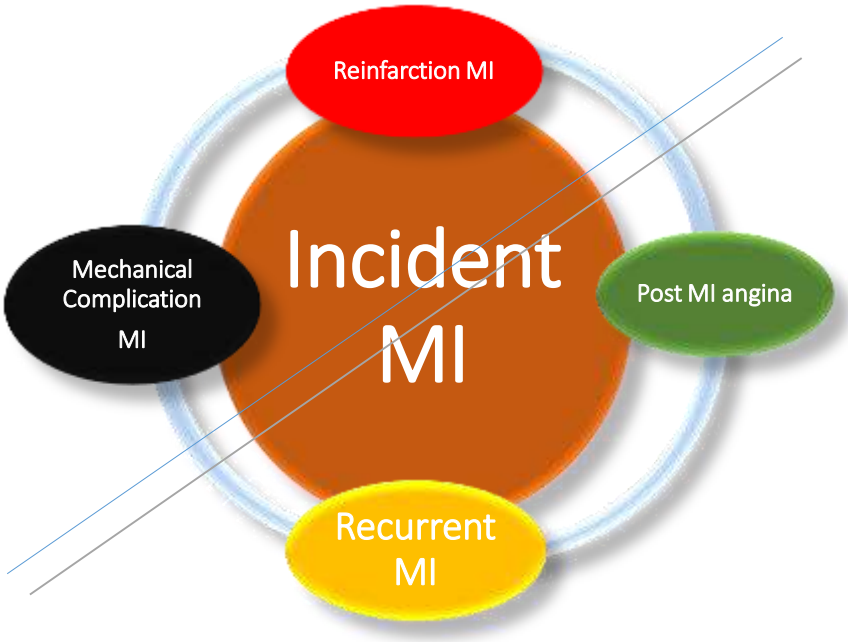
How could I think in this case ??!!

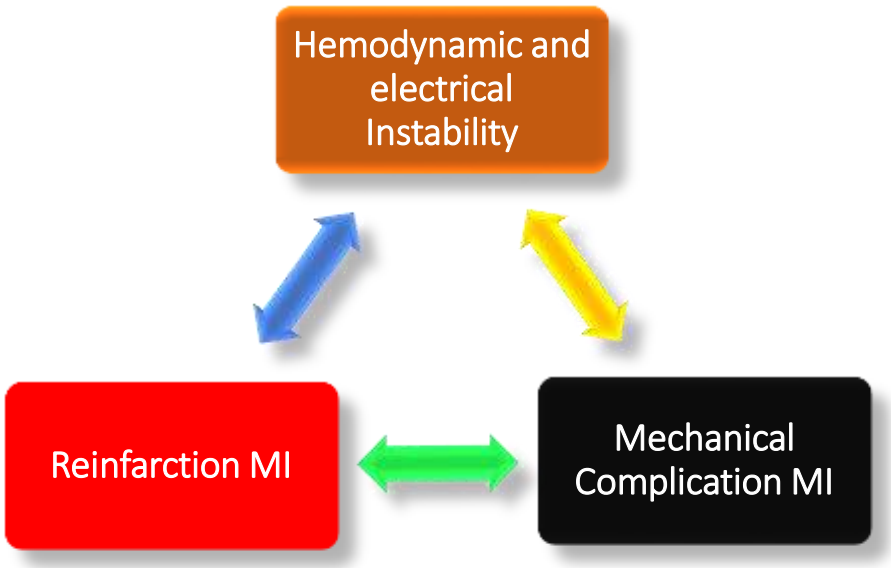
What is the situation of guidelines here ??!!

How to implement and tailoring the guidelines ??!!

Is there any caveats in this case ??!!




Reinfarction MI
Incident MI
Mechanical Complication MI
Post MI angina
Recurrent MI


Hemodynamic and electrical Instability
Reinfarction MI
Mechanical Complication MI

Management and revascularization after fibrinolysis

Emergency PCI is indicated in the case of recurrent ischaemia, haemodynamic instability and life threatening ventricular arrhythmias or evidence of re-occlusion after initial successful fibrinolysis.	I	A	282,284

8.5 Secondary percutaneous coronary intervention

Several randomized trials and meta-analyses have shown that early, routine, post-thrombolysis angiography with subsequent PCI (if required) reduced the rates of re-infarction and recurrent ischaemia, compared with a strategy of 'watchful waiting', in which angiography and revascularization were indicated only in patients with spontaneous or induced severe ischaemia or LV dysfunction.[272–281] The benefits

Recommendations for management of patients with acute heart failure in the setting of ACS

Emergency invasive evaluation is indicated in patients with acute heart failure or cardiogenic shock complicating ACS.	I	B	180,201, 221,331
Emergency PCI is indicated for patients with cardiogenic shock due to STEMI or NSTE-ACS if coronary anatomy is amenable.	I	B	221
Emergency CABG is recommended for patients with cardiogenic shock if the coronary anatomy is not amenable to PCI.	I	B	221

After revascularization of LAD , patient obviously and markedly improved for 24h, after that the patient again become deteriorated hemodynamically , and orientation, <u>bed side Echo accidently revealed colored Doppler flow at the apex and apical septal segment of muscular VSD with PG=85mmHg, with left to right shunt ,</u> at that time patient mechanically ventilated and cardiothoracic consultation was done but the surgeon told it is of high mortality risk and So we refused to but on IABP as abridge to surgery 3 days later patient passed away .

Intra aortic balloon counter pulsation

Intra-aortic balloon pump (IABP) counter pulsation has been widely used as mechanical support in cardiogenic shock. The efficacy of IABP in cardiogenic shock has recently been challenged in the large, randomized Intraaortic Balloon Pump in Cardiogenic Shock IABP-SHOCK II trial, which included 600 patients with cardiogenic shock complicating acute myocardial infarction, who were assigned to IABP or no IABP. The primary endpoint of 30-day mortality was not reduced with the use of IABP and there was no long-term benefit. As a result, the use of IABP for this indication is not routinely recommended but remains an adjunct for patients with mechanical complications as a bridge to surgery.

Why should I consider age and female sex ???

Serpytis et al confirmed that whereas

- female sex,
- advanced age,
- arterial hypertension,
- anterior-wall acute MI,
- absence of previous acute MI,
- and late arrival at hospital

were associated **with a higher risk of mortality from acute VSD,** the time from the onset of acute MI to operation was the most important factor determining operative mortality and intrahospital survival. [9]

Coronary angiography

Take home messages

- Follow up echo-Doppler assessment in side CCU for patients presented with ACS , what ever management strategy should be focused and targeted to exclude mechanical complications specially when patient in haemodynamics instability not just to assess LV functions.
- Risk stratification for CIN scores are not just to safe operators but really it could adversely cause mortality even if there is an excellent angiographic procedural success .
- Weighting risk stratifications specially in subset groups of patients like elderly could be more safer than classic management which carrying with it a high risk of complications that may drastically divert the course of outcomes.

Thanks for attention