Aspiration of Blood From The LV Cavity to Treat Refractory Ventricular Arrhythmias during Complex Coronary Interventions.

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I Have Nothing to Disclose.
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• Ventricular fibrillation (VF) may occur during coronary angiogram or during complex coronary intervention.

• It can happen during wire or catheter manipulation, balloon inflation or stent deployment.

• The reason for that is mainly due to ischemia induced by these maneuvers.

• Ventricular fibrillation occurs frequently in the cath lab when the ischemic substrate is already present as in the setting of acute myocardial infarction or unstable angina.

• VF may also occur as a reaction to the contrast material used during angiogram.
VF is usually treated easily in the cath lab with prompt cardioversion.

VF may become refractory for cardioversion, especially in the setting of severe ischemic burden.

Reduced left ventricular (LV) function and LV cavity dilatation increase the incidence of VF during ischemia and may make it refractory for cardioversion.

Ischemia and LV dilation result in elevation of left ventricular filling pressure (LVEDP).

Elevated LVEDP by itself causes subendocardial ischemia and predispose for VF.
When VF doesn’t respond to cardioversion, myocardial ischemia continue to be present, more LVEDP elevation, more LV dilation, more refractory VF.
• V Fib Begets V Vib
After prolonged V fib cardioversion may sometimes results into an electrical sinus rhythm with QRS complex on the monitor but without any mechanical (contractile) activity on the hemodynamic monitor or fluoroscopy i.e. Electro- mechanical dissociation (EMD).
BACKGROUND

- Insertion of intra aortic balloon pump (IABP) reduces ischemia, LVEDP and LV dilation by unloading the LV only when the contractile activity is present.
- IABP will not be able to unload the LV unless there is a mechanical and an electrical activity with whom the device should be synchronized.
• IABP doesn’t work in V fib or EMD.
METHOD

- We report a new and a quick simple method to unload the LV cavity and reduce LVEDP.
- A pigtail or a JR catheter is inserted inside the LV cavity.
- A manual aspiration of 80 –100cc of blood from the LV cavity is done through the catheter using a 20ml syringe.
- The aspirated blood is thrown away.
- This maneuver will quickly reduce the LVEDP.
- It may make the refractory VF more responsive to cardioversion.
- It can also provide a simple decompression of the overfilled LV cavity after prolonged circulatory arrest.
METHOD

• It is as simple as this.
RESULTS

- This method was used in 5 cases of refractory VF in the cath lab in the setting of AMI or severe unstable angina.
- Three of these cases failed 3 attempts of DC cardioversion.
- After doing this maneuver, those three cases responded immediately to the next attempt of cardioversion.
METHOD
RESULTS

- The 2 other cases of VF responded to cardioversion with electrical sinus rhythm however the 2 patients remained pulseless in electromechanical dissociation (EMD).
- No arterial BP on hemodynamic monitor and no cardiac movement on fluoroscopy were seen.
- Despite ruling out tamponade and mechanically treating cardiac ischemia the two patients remained in EMD.
- After doing the pigtail maneuver EMD resolved and active cardiac movement were seen on fluoroscopy with acceptable arterial pressure recovery.
- One of those two patients required further insertion of IABP to support his BP, IABP was removed after 24h.
RESULTS

• All of these 5 patients survived till hospital discharge.
RESULTS

- This method was used in 3 elderly patients who entered the cath lab on IABP due to cardiogenic shock.
- The maneuver was helpful in restoring SR and getting the patients outside the cath lab in a stable hemodynamic condition on IABP.
- None of those 3 patients survived due to other co-morbid conditions: massive stroke, acute renal failure and sepsis.
- No recurrence of V fib or ventricular arrhythmias were noted in those patients outside the cath lab.
RESULTS

- The maneuver was used in one patient who developed a refractory V fib after the first injection of contrast during diagnostic coronary angiogram.
- The patient failed multiple attempts of cardioversion and was put on CPS.
- After the maneuver successful cardioversion was obtained from the first attempt.
- Coronary angiogram after that showed no obvious stenosis.
- She was took off CPS without any further problem.
My Worst Nightmare
My Worst Nightmare
My Worst Nightmare
My Worst Nightmare
• The maneuver was used in one patient who developed standstill during unprotected LM stenting in the setting of occluded RCA.
• After a chest thumb the patient showed electrical activity on the monitor but there were no mechanical contraction on fluoroscopy.
• After the maneuver mechanical contraction started back and acceptable BP was restored.
RESULTS
RESULTS

- The maneuver was used as a prophylactic method before LM stenting in 4 patients.
- No malignant arrhythmia was noted during or after LM stenting.
- No significant prolonged drop in BP was noted after stenting.
- None of those cases required insertion of an IABP.
CONCLUSION

• Quick insertion of a catheter in the LV with quick blood aspiration facilitates response to cardioversion.
• It may relieve EMD not related to tamponade during coronary intervention.
• The catheter can be used to give intracardiac emergency medication during the code.
• This maneuver may reduce the need of inserting IABP during complex coronary interventions.
• This maneuver can be used as a prophylactic measure before and during complex coronary interventions.
• It looks that the interventional cardiologists need this simple way of LV venting in the cath lab.
FUTURE DIRECTIONS

- To Use this maneuver in the EP lab.
- To Use this maneuver during V fib threshold testing with ICD implants.
- To add the maneuver of direct aspiration of blood from the LV Cavity using a large needle through the chest wall to the algorithm of cardiac resuscitation for a coding victim.
• When you use this maneuver in the future please send me an e-mail with the details.

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• The Golden Cardiovascular Center is proud to be the only Syrian canter who presents at EuroPCR, ESC, TCT and ACC.