Sameh SERSAR
MD FRCSCTS

Cardiothoracic Surgery

Series of Review

Failure To wean Off bypass: (Rate.preload.Pressure.ECHO)

- Look at the HR, Preload and Mean blood Pressure.
- ***If Bradycardic,*** Pacing, atropine and or isoprenaline.
- ***If tachyarrhythmias,……..*** Mg, K, Cardioversion and or amiodarone.
- ***Low preload;……*** Gradual stoppage of the Venous return, Head down, Colloids, Trasfuse blood or cell saver.
- ***High Preload;…..*** Stop Fluids, Head up, Diuretics.
- ***Low Mean BP:……*** Correct the Preload and or HR and Inotropes.
- ***High Mean BP: …….***Vasodilators.
- ***Still can not wean despite optimal Rate, preload and pressure……*** ***ECHO*** and ***Correct any surgical issues if possible.***

Still Can not wean; Check Function of the heart

1. Impaired Function:

- **Inotropes.**
- **Gradual Weaning.**
- **Pacing.**
- **Nitric Oxide.**

2. Normal Function: Vasoplegia;

Vasopressors such as Norepinenephrine, phenylephrine, Vasopressin and Methylene blue.

©©If Still Can not wean….Reperfusion Time;

©©If If Still Can not wean….Balloon, .ECMO.

©Failure To Wean;(Rate.preload.Pressure.ECHO.Reperfusion.Balloon.ECMO)

©©Intra-Aortic Balloon Counter-pulsation (IABP):

1. IT increases cardiac output.
2. It decreases the myocardial O_2 consumpti
3. It increases the aortic pressure.
4. It decreases the afterload (SVR).
5. It increases the coronary blood flow >50% and decreases LVEDP.

NB: The best survival following IABP occurs when it is placed prior to surgery.

©Indications for IABP:

1. Failure to wean from CPB.
2. Post-MI cardiogenic shock.
3. Refractory myocardial ischemia.
4. Post-operative cardiogenic shock.
5. Acute mitral regurgitation or post-infarction VSD; prepare for operation.
6. Ischemic arrhythmias.
7. Bridge to transplant.

© Complications

1. Limb ischemia.
2. Insertion site hemorrhage.
3. Infection.
4. Aortic or iliac perforation.
5. Aortic dissection.
6. Renal artery embolism or thrombosis.
7. Mesenteric infarction.
8. Spinal cord injury.
9. Gas embolization/rupture.
10. CVA.

©Contraindications to IABP:

- Incompetent aortic valve.
- Chronic end-stage heart disease.
- Peripheral vascular disease.
- Aortic dissection and irreversible brain damage.

NB: IABP increases the AR.

©©When To Wean IABP:

- Cardiac index > 2L/min/m^2,
- PCWP < 18 to 20 mm Hg,
- SBP > 100 mm Hg ,
- Urine output > 30 cc/hr ,
- Absence of ischemia on EKG,
- Heart rate < 100 bpm and Absence of dysrhythmias.

How to wean off IABP

(standby.one.to.three)(Decrease.Speed.Flow)

- **Place in standby mode.**
- **Reduce ratio to 1-2 then 1-3.**

Other ASSIST DEVICES Weaning: Decrease SPEED then Flow.

NB: IABP: Inflate in diastole on closure of the aortic valve (dichrotic notch). Deflate just before the systole. *(Infla.dia.infla.notch)*

(R.wave.deflation).

©©If the patient on Balloon and VAD;

(Wean.Balloon.First)(wean.inotropes.second)(wean.VAD.last)

(Wean.Balloon.Ino.VAD)(Balloon.ino.VAD)

©© **IABP Anticoagulation: Activated clotting time >300 seconds or during follow-up as an activated partial thromboplastin time >50 seconds.**

©©A left main CAD on IABP was scheduled for CABG next morning. ICU noticed some blood in the helium line. What do you think? ***This is balloon rupture*** ***that needs to be removed. But Can the patient tolerate without IABP support? Go to OR under fluoroscopy and identify the site of the balloon then control the femoral and or external iliac with proximal and distal control and remove the IABP followed by the CABG.***

NB: ***Blood in the helium channel*** **means** ***Balloon rupture which should be urgently withdrawn on a guidewire with streptokinase and or heparin infusion.***

NB: Blood in the helium channel will harden in 60 min after rupture….obstructing the gas flow preventing complete decompression of the balloon and making its removal very hazardous.

(Blood.in.Helium.equals.Rupture)(Early.rupture.just.withdraw.over.wire)(late.rupture.open)

©©Percutaneous intra-aortic balloon pump inserted but with no augmentation on the monitor. What may it be? It may be a wrong insertion of the IABP in the femoral veins.

- ***NB: Neither the wave pulsatility nor the blood color is a definitive proof of proper vessel cannulated. Urgent ECHO confirmed its wrong insertion in the femoral vein.*** **NB:** ***Remove and cannulate the artery under either ECHO or Flouroscopic guidance.***
- ***Wrong vascular puncture may be in the femoral vein leading to no augmentation, If too low in the superficial femoral artery, it may occlude it causing ischaemia and if too high, it may lead to life-threatening retroperitoneal hemorrhage.***

- **The goal of inflation during diastole is to create a pressure increase that promotes a rapid rise in coronary flow. The goal of deflation during systole is to reduce the afterload.**
- **Early inflation causes early closure of the aortic valve and reduced stroke volume. Late inflation results in suboptimal coronary perfusion.**
- **Early deflation causes a dip in aortic pressure well before ventricular ejection, which fails to lower systolic afterload. Late deflation increases the pressure at the beginning of ejection, causing an undesired increase in afterload.** ***(Inflation.trouble.shoot.stroke.coronary.diastole)(Deflation.troubleshoots.afterload.Deflate.R.wave) (Helium.Low.Density.Low.Turbulent.Rapid.Inflation.Slow.Deflation)***


THANK YOU!