Perioperative Perioperative Management of a Patient with One Patent Coronary Vessel and Prevention of STEMI

Kimpreet Kaur DO, Sandeep Dhanjal MD
San Antonio Uniformed Services Health Educations Consortium (SAUSHEC), San Antonio, TX

Case Presentation

- 55 year old male polytrauma with a complex cardiac history admitted status post MVC versus 18 wheeler requiring urgent tibial intramedullary nail insertion.
- Injuries include bilateral carotid artery dissection, multiple rib fractures, bilateral pulmonary contusions, renal and splenic laceration, and left tibial fracture.
- Cardiac history consisted 3V CABG (LIMA-LAD, SVG-OM1, SVG-PDA) with vein grafts down as of 3 months ago. At that time Impella assisted stent in stent PCI through LIMA of LAD performed. Chronic total occlusion (CTO) of RCA, CTO of proximal LAD, and near CTO of LCx.
- LAD provides back filling of RCA and LCx via septal collateralization and provides profusion to the whole heart.

Management of Severe Coronary Artery Disease in Setting of Urgent Procedure

- Cardiology consulted and recommend patient continue Aspirin and Brillanta as stent was placed 3 months ago
- Patient's primary anesthetic plan consisted of sciatic, femoral, and obturator canal block.
- Maintained native airway with non rebreather mask (SpO2 100%)
- Heart rate was maintained between 80 -100 with esmolol drip to maintain coronary perfusion and decrease oxygen demand.
- ST/T wave monitoring available and patient assessed for acute coronary syndrome symptoms throughout procedure.
- Cardiac depressants were avoided and patient tolerated procedure well.

Physiological Goals to Increase Myocardial Oxygen Supply	Physiological Goals to Decrease Myocardial Oxygen Demand
Low to normal heart rate High oxygen content of blood High normal aortic pressure Reduced coronary vascular resistance Low Left Ventricular end diastolic pressure	Low normal heart rate Low myocardial wall tension or afterload Avoid increased myocardial contractility

Coronary Perfusion

- Diastolic aortic pressure minus left ventricular end diastolic pressure.
- Diastole time inverse to heart rate

Discussion

- There is no strong evidence to support a specific anesthetic technique to prevent myocardial ischemia.
- Increase oxygen supply to myocardium by increasing time in diastole, decreasing afterload, decreasing sympathetic outflow, and maintaining coronary perfusion.
- Optimize hemoglobin for the individual, there is no specific goal that has shown to decrease mortality from myocardial ischemia.
- Monitoring ECG leads II, V4, and V5 increase myocardial ischemia sensitivity to 96%.

Bibliography

1. Braunwald, Eugene. "Myocardial Oxygen Consumption: the Quest for Its Determinants and Some Clinical Fallout." *Journal of the American College of Cardiology*, vol. 34, no. 5, 1999, pp. 1365–1368., doi:10.1016/s0735-1097(99)00428-3.
2. Chu, Chin-Chen, et al. "Propensity Score–Matched Comparison of Postoperative Adverse Outcomes between Geriatric Patients Given a General or a Neuraxial Anesthetic for Hip Surgery:A Population-Based Study." *Anesthesiology*, The American Society of Anesthesiologists, 1 July 2015, anesthesiology.pubs.asahq.org/article.aspx?articleid=2293799.
3. Carson, Jeffrey L, et al. "Liberal versus Restrictive Blood Transfusion Strategy: 3-Year Survival and Cause of Death Results from the FOCUS Randomised Controlled Trial." *Lancet (London, England)*, U.S. National Library of Medicine, 28 Mar. 2015, www.ncbi.nlm.nih.gov/pmc/articles/PMC4498804/.
4. London MJ, Hollenberg M, Wong MG, et al. Intraoperative myocardial ischemia: localization by continuous 12-lead electrocardiography. Anesthesiology. 1988;69(2):232-241.