

Chapter 3

ANESTHESIA IN CORONARY ARTERY BYPASS SURGERY

Gönül ERKAN¹

► Introduction

Increased myocardial metabolic requirements and / or decreased myocardial oxygen delivery may cause myocardial ischemia.

Causes of myocardial ischemia:

- Atherosclerosis of the coronary arteries (the most common cause)
- Vasospasm of coronary arteries
- Severe hypertension or tachycardia
- Severe hypotension or anemia
- Severe aortic stenosis or regurgitation

Coronary artery disease is responsible for one third of deaths in western societies. It is also the major cause of perioperative morbidity and mortality. Coronary arterial disease occurs as:

1. Myocardial infarction
2. Unstable angina
3. Chronic stable angina

Unstable angina is defined in the following figures:

1. Angina attack over three per day
2. Resting angina attack at rest
3. Severe and more than three episodes per day in the last two months

This demonstrates severe coronary artery disease and are frequently heralding myocardial infarction.

¹ (Anesthesiologist),
University of Health Sciences Ahi Evren Chest Cardiovascular Surgery Hospital
Anesthesia and Reanimation / Trabzon, Turkey

► References

1. Cope DK, Impastato WK, Cohen MV, et al: Volatile anesthetics protect the ischemic rappid myocardium from infarction. *Anesthesiology* 1997;86:699-709.
2. De Hert SG, Broecke PW, Mertens E, et al: Sevoflurane but not propofol preserves myocardial funktion in coronary surgery patients. *Anesthesiology* 2002;97:42-49.
3. Dinardo JA: Miyokard Revaskularizasyonunda Anestezi. In: Dinardo JA, editör. *Anesthesia for Cardiac Surgery*. 2. Ed. Ankara: Güneş Tıp Kitapevleri 2002; 94-95.
4. Dönmez A: Koroner arter bypass cerrahisinde anestezi yaklaşım. *Kalp ve Anestezi. İntertıp yayınevi* 2015; 10:185-197.
5. Engebretsen KV, Friis C, Sandvik L, et al: Survival after CABG--better than predicted by EuroSCORE and equal to the general population. *Scand Cardiovasc J*. 2009; 43(2):123-8.
6. Ettema RG, Peelen LM, Kalkman CJ, et al: Predicting prolonged intensive care unit stays in older cardiac surgery patients: a validation study. *Intensive Care Med* 2011; 37(9):1480-7.
7. Giakoumidakis K, Baltopoulos GI, Charitos C, et al: Risk factors for increased in-hospital mortality: A cohort study among cardiac surgery patients. *Eur J Cardiovasc Nurs* 2012; 11(1): 23-33.
8. Hensley F, Martin D, Gravlee G: (Denker ÇE, çev.ed.) *Kardiyak Cerrahide Anestezi Yönetimi. Pratik Yaklaşım ile Kardiyak Anestezi*. Güneş Tıp Kitapevleri 5. Baskı; 6:179-191.
9. Kowalik MM, Lango R, Klajbor K, et al: Incidence and mortality-related risk factors of acute kidney injury requiring hemofiltration treatment in patients under going cardiac surgery: A single-center 6-year experience. *J Cardiothorac Vasc Anesth* 2011;25:619-624.
10. Meissner A, Rolf N, Van Aken H: Thoracic epidural anesthesia and the patient with heart disease: Benefits, risks and controversies. *Anesth Analg* 1997;85:517-528.
11. Morgan E, Mikhail M, Murray M, Larson PC: (Tulunay M, Cuhruk H,Çev.Ed.) *LANGE Klinik Anesteziyoloji.Üçüncü baskı*. Güneş Tıp Kitapevleri 2004;20:395-405
12. Ozkaynak İ, Baysal A, Doğukan M, et. al: The Investigation of Occurrence of Hepatic Dysfunction in the Postoperative Period of Open-Heart Surgery. *Turkish Journal of Anaesthesiology and Reanimation* 2012; 40(6): 297-302.
13. Pagel PS, Warltier DC: *Anesthetics and left ventricular function* .In: Warltier DC,ed. *Ventricular function, a Society of Cardiovascular Anesthesiologists Monograph*. Baltimore, MD: Williams and Wilkins 1995; 213-252.
14. Riera M, Carrillo A, Ibanez J, et al: Predictive value of the EuroSCORE model in cardiac surgery in our site. *Med Intensiva* 2007;31(5):231- 6.
15. Starr HJ, Sethna DH, Etfanous FG: Bradycardia and asystole following therapid administration of sufentanyl with vecuronium. *Anesthesiology* 1986;64:521-523.
16. Schwinn DA, Clements F, Hawkins E, et al: Time course and hemodynamic effect of alpha 1 adrenergic administration in anesthetized patients. *Anesthesiology* 1987;67:A72.
17. Schuttler J, Zsigmond EK, Whiter PE: Ketamine and its isomers. In: White PF,ed. *Textbook of intravenous Anesthesia*. Philadelphia, PA: Williams and Wilkins, 1997; 171-188.
18. Sontag H, Larsen R, Hilfiker O, et al: Myocardial blood flow and oxygen consumption during high-dose fentanyl anesthesia in patients with coronary artery disease. *Anesthesiology* 1982;56:417-422.
19. Sontag H, Stephan H, Lange H, et al: Sulfentanyl does not block sympathetic responses to surgical stimuli in patients having coronary artery revascularization surgery. *Anesth Analg* 1989;68:584-592.
20. Tomson IR, Hudson RJ, Rosenbloom M, et al: Catecholamine responses to anesthetic induction wit hfentanyl and sulfentanyl. *J Cardiothorac Anesth* 1988;2:18-22.
21. Qadir I, Perveen S, Furnaz S, et al: Risk stratification analysis of operative mortality in isolated coronary artery bypass graft patients in Pakistan: comparison between additive and logistic EuroSCORE models. *Interact Cardiovasc Thorac Surg* 2011; 13(2):137-41.44.

22. Velaco FI, Tarlow LS, Thomas SJ: Economic rationale for early extubation. *J Cardiothorac Vasc Anesth* 1995;9:2-9.
23. Wange JY, Winship SM, Thomas SD, et al: Induction of anesthesia in patients with coronary artery disease: A Comparison between sevoflurane-remifentanyl and fentanyl-etomidate. *Anaesth Intens Care* 1999;27:363-368.
24. Weintraub AC, Barash PG: Pro: A pulmonary catheter is indicated in all patients for coronary artery surgery. *J Cardiothorac Anesth* 1987;1:358-361.
25. Wu ZK, Livainen T, Pehkonen E, et al: Arrhythmias in off-pump coronary artery bypass grafting and the antiarrhythmic effect of regional ischemic preconditioning. *J Cardiothorac Vasc Anesth* 2003;17:459-464.