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Morgan Kleinfelder

kleinfelder2@otterbein.edu

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Early Mobilization in Cardiac Surgery Patients

Morgan Kleinfelder RN, BSN, CCRN

Otterbein University, Westerville, Ohio

Coronary Artery Disease (CAD)

Introduction

Coronary artery disease (CAD) is one of the largest causes of mortality and hospitalization worldwide (Santos et al., 2017). Every 40 seconds an American will die of a heart attack (Viranri et al., 2020). CAD is an essential topic that must be discussed by health care professionals. With the amount of hospitalization and mortality, health care professionals must be prepared and have an understanding of CAD. Healthcare professionals taking care of these patients need to be aware of risk factors, signs and symptoms, medical management, and surgical management of the disease. This poster seeks to educate medical professionals as well as the public to understand treatment and the severity of heart disease.

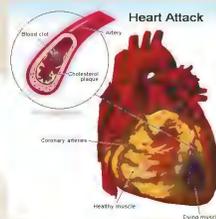
Underlying Pathology

Coronary artery disease (CAD) or coronary heart disease (CHD) is when the heart muscle does not receive enough oxygen and nutrients, which leads to ineffective ability to pump (McCance & Huether, 2014). CAD is a buildup of plaque in the arteries of the heart, (American Heart Association, 2015) which can lead to heart attacks. With the buildup of plaque in arteries, the blood flow is limited to the heart muscle. A lack of blood flow can lead to heart ischemia (American Heart Association, 2015). With new technologies, there are many treatment options both medical and surgical interventions such as stents, open-heart surgery, anti-platelet or anti-coagulant medications. CAD causes mortality worldwide and is considered a medical emergency. On American Heart Association, 868,662 deaths in the United States are related to underlying heart disease (2021). When experiencing signs and symptoms of a heart attack, call 911 and seek medical attention.

<https://www.heart.org/en/health-topics/heart-attack/warning-signs-of-a-heart-attack>

Significance of Pathophysiology

Due to severity of heart disease, it is important for health care providers to be able to appropriately diagnosis CAD. Atherosclerosis, which was once thought of as a cholesterol storage disease, is now considered an inflammatory disease (Libby & Theroux, 2005). The heart has the unique ability to create collateral circulation and revascularize damaged parts of the heart (Libby & Theroux, 2005). When patients go to the emergency department (ED) with chest pain (CP), it is the medical doctors (MD) duty to determine the cause behind chest pain. An electrocardiogram (ECG) should be completed as well as cardiac marker blood work. It is important to for health care professionals to understand the significance and high risk of mortality associated with CP and CAD. With proper diagnosis, appropriate care and interventions can be provided to the patient.



https://www.medicinenet.com/heart_attack/article.htm



Risk Factors for CAD

- High LDL cholesterol
 - Low LDL cholesterol
 - High blood pressure
 - Family history
 - Diabetes
 - Smoking
 - Post-menopausal for women
 - Male 45 years or older
 - Obesity
- (American Heart Association, 2015)

Signs and Symptoms of Heart Attack

- Chest discomfort (can feel like uncomfortable pressure, squeezing, fullness or pain)
- Discomfort in other areas of the upper body (pain or discomfort in one or both arms, the back, neck, jaw, or stomach)
- Shortness of breathe
- Nausea
- Lightheadedness
- Breaking out in cold sweat
- Symptoms may differ between men and women

(Correction to... Association, 2021)

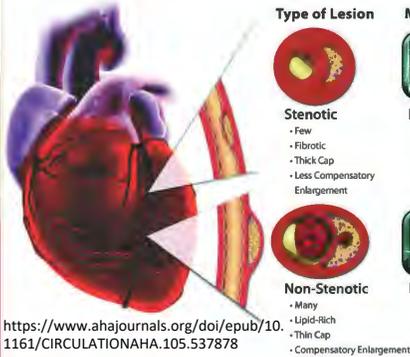
Decrease risk of CAD

- Proper nutrition
- Weight management
- Getting plenty of physical activity

(American Heart Association, 2015)

Treatment of CAD

“Cardiac surgery stand out from other forms of treatment due to the advances in techniques and materials that have resulted in safe procedures and lower perioperative risk” (Santos et al., p.1). Even with these advances, cardiac surgery is not the first treatment option. If a person comes into the ED with ST elevation (STEMI) on the ECG, the patient first goes to the catherization lab. “Percutaneous coronary intervention (PCI) is a procedure whereby stenotic (narrowed) coronary vessels are dilated with a catheter” (McCance & Huether, 2014). With a PCI, sometimes a stent is placed to keep the vessel open. With the utilization of PCI, it prevents further heart damage. By dilating the vessel, blood is able to flow freely through the arteries and supply oxygen and nutrients to the heart muscle.



<https://www.ahajournals.org/doi/epub/10.1161/CIRCULATIONAHA.105.537878>

What to expect with cardiac surgery

- If surgery is not emergent, a patient may spend a couple days in the hospital
- Surgery can take 3-6 hours
- The patient will have a breathing tube for general anesthesia, which they may or may not remember and may have a sore throat
- After surgery, the patient will have a long medial chest incision, chest tubes, urinary catheter, and pacemaker wires
- The patient will go “on pump” meaning on coronary artery bypass where the heart is not beating (Mayo Clinic, n.d.)

If multiple vessels are blocked and the patient is a surgical candidate, open-heart/cardiac surgery can be performed. With this surgery, the patients blocked vessels are then bypassed by new arteries or veins the cardiothoracic surgeon sows onto the heart tissue. With any surgical procedure, especially open-heart surgery, complications may arise. However, with new technologies and advancements, it is becoming a safe surgery. Cardiac surgery can prolong the patients life and decrease the risk of heart attacks in the first couple of years. If a patient has cardiac surgery, proper nutrition, exercise, and lifestyle modifications are essential for the best results.

Type of Lesion	Clinical Manifestation	Management
Stenotic <ul style="list-style-type: none">• Few• Fibrotic• Thick Cap• Less Compensatory Enlargement	Ischemia <ul style="list-style-type: none">• Angina Pectoris• Positive Exercise Test• Perfusion Defect	Local Therapy/ Revascularization <ul style="list-style-type: none">• PTCA• Stent• CABG
Non-Stenotic <ul style="list-style-type: none">• Many• Lipid-Rich• Thin Cap• Compensatory Enlargement	Infarction	Systemic Therapy <ul style="list-style-type: none">• Lifestyle Modification• Drug Therapy

Surgical Complication

With any major surgery, there is always a risk. Potential risks a patient may experience after open-heart surgery include:

- Bleeding
- An irregular heart rhythm
- Infections of the chest wound
- Memory loss or trouble thinking clearly, which often improves within six to 12 months
- Kidney problems
- Stroke
- Heart attack, if a blood clot breaks loose soon after surgery

(Mayo Clinic, n.d.)

Nursing Implication

Early Mobilization After Cardiac Surgery

After open heart surgery, early mobilization is key. In order to decrease length of stay, improve physical function, and optimize the rehabilitation, early mobilization is essential (Kanejima et al., 2020). Early mobilization protocols can be implemented into the intensive care unit when postoperative open heart surgeries are recovered. Protocols can vary from hospital to hospital, but the key concept is early mobilization. With close hemodynamic and electrocardiogram monitoring, early mobilization is a safe practice (Cassina et al., 2016). In a research article by Borregaard et al. (2019), health-related quality of life is higher perioperative when compared with postoperative. However, with early mobilization physical function improves and increases quality of life.

Early Mobilization Protocol

Day of surgery- postoperative day (POD)0
- ensure liberation from the mechanical ventilator in a timely manner
- Promote rest and manage pain first night in intensive care unit

POD1

- If patient is hemodynamically stable with minimal chest tube output and no electrocardiogram changes, attempt to get patient up at 0600.
- Monitor all vital signs on cardiac monitor. Utilize 2-3 nurses depending on patient size and hemodynamic stability.
- Assign roles for each nurse to maintain patient safety.
- Allow patient to sit on side of bed to ensure adequate blood pressure.
- If blood pressure remains stable, stand and pivot patient to chair.
- If patient is unsuccessful, attempt to get patient up in a couple hours. Continue to attempt a few times each day until patient successfully stands and pivots to the chair.

*Some early mobilization protocols differ on specific steps or time of first attempt. Some research articles define early mobilization before POD 3 or even POD 5.

Patient Education

- Provide education to patient and family about heart disease including: sign & symptoms, risk factors, and when to seek medical advice
- Educate patient on importance of diet and exercise to maintain a healthy lifestyle
- Educate patient on postoperative cardiac surgery instruction, early mobilization, and discharge instructions
- Help patient with fears about going home with risk of heart attack by provided open and honest therapeutic communication.
- Educate patients of the importance of smoking cessation
- Help patient with self-image after cardiac surgery through active listening
- Educate patients on importance of medication administration and taking the correct dosage
- Educate on importance of checking blood pressure regularly and proper technique
- Provide educational resources for more information about CAD

Conclusion

Coronary artery disease (CAD) is a serious medical condition. When experiencing sign and symptoms of a heart attack, it is essential to call 911 and seek medical attention immediately. In addition, health care professionals should be educated on the severity of CAD and the importance of quick diagnosis so patients can receive the best treatment possible. With the wide variety of treatment options, it is best to consult cardiologist and sometimes cardiothoracic surgery. With teamwork between ER doctors, intensive care doctors, cardiologists, interventional radiologist doctors, cardiothoracic surgeons, and bedside nurses, proper care can be given to all patients experience a heart attack or CAD. With proper education to the public and health care, the incidence of mortality will decrease. Overall, CAD is a life-threatening emergency and proper medical attention should be sought out to decrease the rate of mortality.

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