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Anomalous Coronary Artery Disease

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Coronary artery anomalies (CAAs) are classified according to the origin, course, destination, and size of the anomalous vessel. The various types and subtypes of this condition can cause stenosis and sudden death. Failure to thrive, sudden death (Cheezum et al, 2016), and mitral regurgitant murmur or gallop chest x-ray possibly revealing cardiomegaly. An electrocardiography (ECG) may also reveal ST-elevation or Q-wave present (Cheezum et al, 2016). An echocardiogram remains the primary test for diagnosis and often shows left ventricle dilation and mitral valve regurgitation. Many patients with condition are asymptomatic.

### Underlying Pathophysiology

- Pathophysiology of CAA is unclear and not well understood.
- It is a rare congenital congenital condition, affecting individuals with an abnormal flow pattern of blood through the coronary arteries.
- Variable valve resides in the vessel and acts like coronary arteries, causing patients to have clinical manifestations of Angina (Suramanyam, Lee, Aedin, & L BH, 2015, p. 363). In the instance of the anomalous origin of the right coronary artery from the pulmonary artery (ACAPA), blood flow through the coronary arteries moves in the direction of the pressure gradient along the path of least resistance.
- With the anomalous coronary artery, the lower pulmonary artery pressure favors blood flow from the normal right coronary artery through collateral vessels to the left coronary artery system.
- Blood flow then continues through the normal coronary arteries creating a steal of coronary blood flow across the myocardium.
- The diversion of blood flow away from the myocardium causes ischemia and myocardial dysfunction (Fahy et al, 2012).

### Clinical Presentation

- Anomalies of the coronary arteries are not well understood and are extremely rare in the general population (Suramanyan, 2015).
- Coronary artery anomalies (CAAs) are rare conditions that may be associated with myocardial ischemia, lethal ventricular rhythms, and sudden death.

### Current Population

- The current population affected is estimated to be 0.1 to 0.7 percent (Brothers et al, 2015) and affect approximately 1 in every 300,000 live births (Fahy et al, 2012).
- Many are considered benign, but identifying those that can be fatal is an ongoing challenge in the medical field.

### Significance of Pathophysiology

- This condition can cause sudden death and symptoms. If these anomalies can be identified earlier in life, the patient can be monitored and treated accordingly. The pathologic process indicates how the arteries maintain alternate blood flow. This is significant to any healthcare provider when it comes to providing treatment or giving medication because these patients may have decreased cardiac output and increased oxygen demand due to the ischemia that may be present in the myocardium.
- According to research listed previously, many cases present with myocardial infarction symptoms. As healthcare providers, it is important to recognize that an anomaly of the coronary artery could be the pathophysiology behind the individual’s signs and symptoms.

### Anomalous Coronary Artery Disease

**Introduction**

Vital that healthcare providers be able to identify the anomalies that have a higher risk of sudden death (Brothers, Gaynor, Jacobs, & Aytek İnsan, 2015). This means more education and awareness of signs and symptoms of diagnostic tests and treatments is required.

The gold standard for diagnosing CAA is echocardiogram, however further tests to evaluate the condition include intravascular ultrasonic to evaluate the mechanisms of ischemia, nuclear stress tests to examine effort induced ischemia, and coronary angiography (Yildiz, Karabay, Alman, & Aytek İnsan, 2015). These tests mean further education for staff, nurses, more funding, and more awareness of the treatments.

Surgical treatment for these cases also means more postoperative treatment, more patient education by the nurses and physicians, and improved technology in these surgical interventions (Bradley, 2015).

Blockers are prescribed for medical management (Yildiz, Karabay, Alman, & Aytek İnsan, 2015).

- Precautions such as exercise restrictions need to be explored with patients with CAA (Cheezum et al, 2017).
- When the pathophysiology being unclear for this condition, this means there is more opportunity for continuing research on this topic for nurses and physicians.

### Signs and Symptoms

- Crushing chest pain
- Diaphoresis
- Dyspnea on exertion
- Tachypnea
- Failure to thrive
- Sudden death (Chigurupati et al, 2016)

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### Conclusion

In conclusion, this rare and poorly understood disease presents an opportunity for healthcare providers to learn and continue researching this interesting topic.

With this condition being congenital, perhaps in the future this disease can be further testing on infants, or new treatments identified for each subtype of anomaly.

With the current research, it is known that this condition can cause sudden death so it vital that we continue to gain knowledge of this topic, and increase our awareness of this condition as healthcare providers.

Medical providers will need to work in conjunction with congenital heart specialist in the management of this condition.

This disease can affect a wide spectrum of patients including infants up to older adults, to awareness and education of this disease is important in any field of medical practice whether it is pediatrics, primary care, or anesthesia.

### References


