

CARDIOMYOPATHY– A Case Study

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ABSTRACT

Cardiomyopathy is an anatomic and pathologic diagnosis associated with muscle or electrical dysfunction of the heart. Cardiomyopathies represent a heterogeneous group of diseases that often lead to progressive heart failure with significant morbidity and mortality. Cardiomyopathies may be primary (i.e., genetic, mixed, or acquired) or secondary (e.g., infiltrative, toxic, inflammatory). Major types include dilated cardiomyopathy, hypertrophic cardiomyopathy, restrictive cardiomyopathy, and arrhythmogenic right ventricular cardiomyopathy. Although cardiomyopathy is asymptomatic in the early stages, symptoms are the same as those characteristically seen in any type of heart failure and may include shortness of breath, fatigue, cough, orthopnea, paroxysmal nocturnal dyspnea, and edema. Diagnostic studies include B-type natriuretic peptide levels, baseline serum chemistries, electrocardiography, and echocardiography. Treatment is targeted at relieving the symptoms of heart failure and reducing rates of heart failure–related hospitalization and mortality. Treatment options include pharmacotherapy, implantable cardioverter-defibrillators, cardiac resynchronization therapy, and heart transplantation. Recommended lifestyle changes include restricting alcohol consumption, losing weight, exercising, quitting smoking, and eating a low-sodium diet.

INTRODUCTION

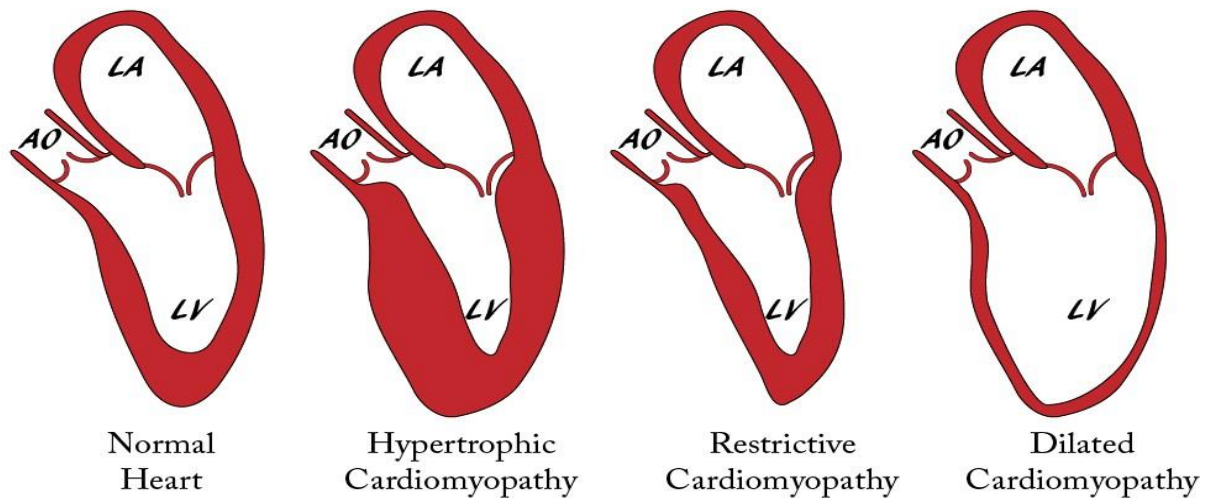
Cardiomyopathies are a mixed group of diseases of the myocardium (cardiac muscle) defined by structural or functional abnormalities that negatively affect the pump function of the heart. In some types, there is obstruction to the outflow of blood during the cardiac cycle (Jarvis and Saman, 2018). Advances in clinical and genomic medicine have led to better detection and understanding of cardiomyopathies (some of which have a strong genetic component), while high-profile cases of sudden cardiac death have increased awareness of the conditions. This first article in a two-part series covers the classification, pathophysiology and presentation of cardiomyopathies.

The main types of cardiomyopathies are:

- Dilated cardiomyopathy (DCM)
- Hypertrophic cardiomyopathy (HCM)
- Restrictive cardiomyopathy (RCM)
- Arrhythmogenic cardiomyopathy (ACM)
- Unclassified cardiomyopathies.

Cardiomyopathy

Apical, Long Axis, Three Chamber View



Case presentation:

History of present illness: Mr. X, 50 years male got admitted in MMM hospital on 26/03/2023 with the chief complaints of dyspnoea on exertion, orthopnoea, proximal nocturnal dyspnoea for one year, severity for one week. He underwent many investigations and he diagnosed has recent DILATED CARDIOMYOPATHY.

Social history:

He is an alcoholic for more than 10 years however, use. He is in a married, and has two children. He is employed in private company.

Allergies: No known medicine, food, or environmental allergies.

Past medical history: He has a medical history on COPD for one year, Diabetic mellitus for three year, hypertension for six months on irregular treatment.

Past surgical history: Nil

PHYSICAL EXAMINATION

Vitals: Temperature: 98.4°F, Heart rate: 74 beats/minute, Respiration: 16 breath/minute, Blood pressure: 160/100mmHg, SPO2 : 98%

General: he is conscious and oriented well appearing but anxious, a pleasant male lying on a hospital bed.

Cardiovascular: he has a regular rate and rhythm with no murmurs, rubs, or gallops.

Gastrointestinal: Tenderness over right hypochondriac region. Bowel sounds heard. No bruits or pulsatile mass.

Findings of physical examination:

- tenderness over right hypochondriac region
- pale conjunctiva
- sclera mild yellow in colour
- skin yellowish brown in colour
- mild dehydration present
- Central line D3
- Patient is on Foley's catheter day 3

CLINICAL EVALUATION OF PATIENT

ELECTROCARDIOGRAM:

Sinus tachycardia probable left atrial enlargement right axis deviation probable anterolateral infarct

ECHO CARDIOGRAM:

Dilated LV/LA

Severe LV systolic dysfunction (EF=24%) Normal

RV systolic

Moderate MR

Grade-II TR/Mild PAH

Right mild to moderate pleural effusion Global

hyperkinesia **MANAGEMENT:**

Many medications are used to treat cardiomyopathy. Depending on the type of cardiomyopathy, your health care professional may prescribe medicines to:

- Lower your blood pressure.
- Slow your heart rate.
- Keep your heart beating with a normal rhythm.
- Balance electrolytes in your body.
- Remove excess fluid and sodium from your body.
- Prevent blood clots from forming.
- Reduce inflammation.

SURGICAL MANAGEMENT:

Implanted devices for arrhythmias

If you have an arrhythmia or a history of a life-threatening event caused by an abnormal heart rhythm, you may receive an implanted device. These devices have wires that your provider inserts into your heart through a vein and a controller implanted under your skin. The controller delivers a charge to your heart to help regulate your heart rate.

The types of implanted devices include:

Implantable cardioverter defibrillator, detects an abnormal heart rhythm and shocks your heart to restore a normal heart rate. Permanent pacemaker, continuously delivers pulses to your heart to keep your heart rhythm steady.

Coronary artery bypass graft surgery:

In people with coronary artery disease, the arteries that carry blood to your heart muscle become lined with deposits called plaque. When these deposits build up, they can narrow or completely block your coronary arteries. This interferes with blood flow and reduces the amount of oxygen and nutrients traveling to your heart. Over time, this weakens your heart muscle and reduces its ability to pump blood.

In coronary artery bypass graft surgery:

A surgeon reroutes blood around a narrowed or blocked coronary artery. They'll use a blood vessel (graft) from somewhere else in your body and attach it above and below the affected area. Surgeons perform this procedure as open-heart surgery or as minimally invasive surgery, depending on your situation. Coronary angioplasty and stent: This is a minimally invasive procedure used to treat coronary artery disease. It opens narrowed or blocked coronary arteries from the inside.

In a coronary angioplasty and stent procedure, your provider:

Inserts the catheter into a blood vessel in your groin or wrist. Threads the catheter to the narrowed or blocked artery in your heart. Inflates a balloon to compress the plaque inside the artery and open the blockage. Installs a metal mesh tube (stent) to hold the artery open.

Heart valve surgery:

The valves in your heart separate the upper and lower chambers and keep blood moving in the forward direction. In heart valve disease, your heart valves may leak (regurgitation), allowing blood to flow backward. Valves can also become stiff and narrow (stenosis). In both cases, your heart has to work harder to pump blood. This added stress on the pumping chambers of your heart can lead to heart failure. Heart valve surgery may involve the repair or replacement of a valve. There are many types of heart valve surgeries. Providers perform some heart valve procedures using catheters, which require only a small incision in your groin. Other heart valve procedures require open heart surgery or minimally invasive surgery through a smaller incision in your chest.

Left ventricular assist device (LVAD)

Some people with heart failure reach a point where their heart can no longer meet the needs of their body on its own. A left ventricular assist device (LVAD) is an implanted device that helps your left ventricle pump blood. It connects to an external controller worn on the outside of your body. You may receive an LVAD as a long-term treatment for heart failure or as a bridge treatment while you wait for a heart transplant.

NURSING MANAGEMENT:

- Instruct the client regarding the purpose of diagnostic medical & surgical procedures and the pre- & post procedure expectations.
- Assist the client to identify risk factors that can be modified, and set goals that will promote change in lifestyle to reduce the impact of risk factors.
- Instruct client regarding a low-calorie, low-sodium, low-cholesterol, low-fat diet with an increase in dietary fibre.
- Stress that dietary changes are not temporary and must be maintained for life.
- Provide community resources to client regarding exercise, smoking cessation and stress reduction.
- Assess the heart rate, blood pressure, and respiratory rate, heart and lung sounds are auscultated and peripheral pulses are palpated
- Assesses for signs and symptoms of heart failure.
- Monitor for dysrhythmias by palpating the patient's pulse for strength and rhythm {I.e. regular or irregular} and monitor the ECG continuously for dysrhythmias.
- Physical examination and complete history taking the history includes drug allergies, medical and surgical history of the patient.
- Risk assessment of the patient to avoid death during the surgery.
- Providing information to the patient & gaining a consent.
- Preoperative fasting.
- Collect or prepare of the blood product.
- Pre-operative medications for patient.
- Monitoring the vital signs of the patient.
- Arrange for the staffs adequately for the surgical procedure

CONCLUSION:

Cardiomyopathy can make your heart stiffen, enlarge or thicken and can cause scar tissue. As a result, your heart can't pump blood effectively to the rest of your body. In time, your heart can weaken and cardiomyopathy can lead to heart failure.

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