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Heart to Heart Talk

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Cardiomyopathy: Flabby Heart

What is cardiomyopathy?

Cardiomyopathy is a serious disease of the muscles of the heart, where they become enlarged, flabby, and weak, severely reducing the heart's ability to pump blood effectively. The heart may also be dilated (stretched out of shape) due to the loss of effective "recoil" contraction after it has relaxed open to accommodate inflow of blood into its chambers. This weakness in contractability causes poor pump action and back up of blood, with some degree of pooling, in the lungs and other vital organs. This leads to accumulation of the fluid in the lungs, liver, kidney, legs, etc. Most patients with dilated cardiomyopathy end up with heart failure. The rhythm of the heart beat may also be disrupted to a dangerous degree.

What is the mechanism of this pumping weakness?

This involves the Starling Law in medical physics and physiology, which, in simple term, states that when the (heart) muscles are overstretched, their ability to contract or pump becomes severely reduced. There is a maximum limit to the stretching where the contractile (or pumping) power is at its most efficient peak. This is similar to the squeezing power of the hand. The more you open your hand to squeeze a very large object (example, a basketball), where your hand is practically stretched flat open, the weaker your grip or squeezing power becomes.

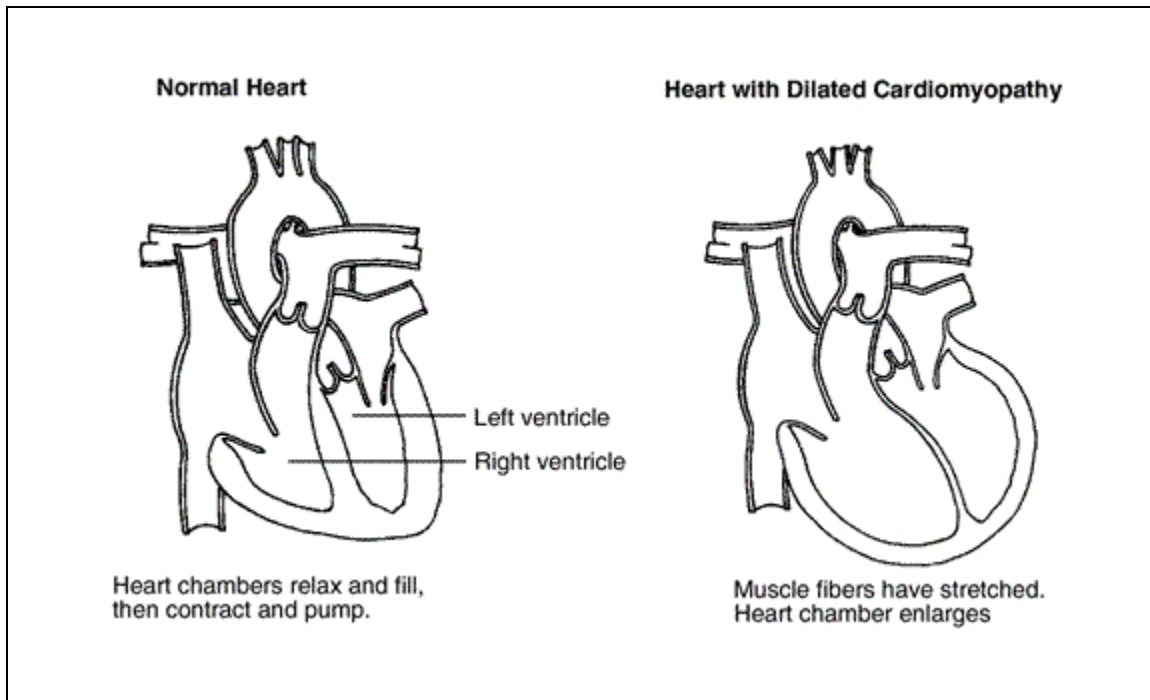
What are the types of cardiomyopathy?

There are two general forms of cardiomyopathies: (a) Ischemic, where the cause is coronary arteriosclerosis (blockages of the heart arteries, depriving the heart muscles of blood, oxygen and nutrition, much like in heart attack; and, (b) Non-ischemic or idiopathic cardiomyopathy (ICM), where the cause is unidentifiable or unknown and where coronary arteries are normal. This second form is much less common.

What is the incidence of ICM?

About 50,000 Americans have idiopathic cardiomyopathy. ICM is prevalent among young people unlike many other forms of heart diseases, and is by far the leading indication for heart transplantation, closely followed by cardiomyopathy from end-stage coronary heart disease, where even coronary bypass surgery can no

longer be done. The disease is usually progressive, and in many cases, it gets worse rapidly.



What causes cardiomyopathy?

The muscle damage could be caused by coronary artery disease, such as heart attacks (the ischemic type). Most cardiomyopathies (the non-ischemic variety, which is subclassified as dilated, hypertrophic and restrictive) are called idiopathic, where the cause of the damage is unknown. However, there are some factors which have been implicated, among them are: diabetes, poor diet, lack of exercise, smoking, excessive alcohol intake, illegal drugs (cocaine, etc.), infections (usually viral) leading to inflammation of the heart muscles (myocarditis), toxins (like cobalt, once used in beers), some pregnancies, and uncommonly, heredity. Some prescription medications and particular anti-cancer agents (like doxorubicin and daunorubicin) have caused cardiomyopathy too in some patients.

What are the symptoms?

Dilated cardiomyopathy may be present for years without symptoms. However, in due course, the heart gradually weakens and enlarges. The symptoms and signs are those of congestive heart failure: progressive shortness of breath, fatigue, weakness, coughing spells, especially when lying down, or, after physical exertion, a sense of drowning due to lung congestion, edema (swelling) of the feet and legs, abnormal weight gain from fluid retention. Advanced stages of cardiomyopathy can cause severe heart failure, with chest and/or abdominal pains, and serious

arrhythmias (irregularity of the heartbeat), which can be life threatening. Sudden deaths have been reported among these cases.

How is the diagnosis made?

In majority of cases, an astute clinician can make a tentative diagnosis based on the patient's medical history and physical examination. However, it behooves the attending physician to differentiate this from various other heart conditions that cause heart failure.

What are the usual tests ordered?

In general, the following are done: chest X-ray, electrocardiogram and echocardiogram. The more specific tests which may be needed include radionuclide ventriculogram and/or cardiac catheterization.

What is the treatment for cardiomyopathy?

Early diagnosis of cardiomyopathy is not easy; many patients are seen when they already have beginning or full-blown heart failure, in the advanced stage of the disease. The principle of treatment is to control the symptoms of heart failure, manage causal or complicating factors (like alcohol intake, smoking, etc.) to minimize the progression of the disease. Weight control and dietary changes, especially salt restriction, is a beneficial part of therapy. There is no cure for cardiomyopathy. For those who are under 60 years of age, otherwise healthy, and who satisfy the other criteria for heart transplantation, this procedure is the only viable alternative.

What drugs are used to control the symptoms?

These are the diuretics, to promote urination and reduce body fluid accumulation; ACE (angiotensin-converting enzyme) inhibitors, to relax the blood vessels, making it easier for the heart to pump blood, and to control of high blood pressure; digitalis, to help cardiac pumping force and regulate heart rhythm; Calcium blockers or beta blockers, also to control the rhythm and improve heart muscle function. If rhythm is still uncontrolled, other more sophisticated drugs may be used.

What is the prognosis of cardiomyopathy?

The disease is progressive and as time goes by, the heart continues to enlarge and get weaker, and the efficiency of the cardiac pumping diminishes. As a consequence, some individuals with this disease are unable to do even simple physical activities, such as walking, and, in severe cases, even talking long sentences without being short of breath. Some luckier patients, who are disciplined and under regular medical care, remain fairly stable for years. Since patients are usually seen

in their advanced stage of cardiomyopathy, about 50% with dilated heart live 5 years, and about 25% survive 10 years, after the diagnosis of heart failure is made.

How beneficial is heart transplant?

Survival is greatly improved with cardiac transplantation. About 75% of these patients live 5 years or longer after the transplant. Unfortunately, there is a scarcity of donor hearts (only about 2000 per year in the USA) and those who satisfy the criteria have to wait for months or years, many of them dying before donor hearts are available. A few, somehow, have improved while waiting, and taken off the transplant list.

What are LVADs?

These are left ventricular assist devices (small implanted mechanical pumps) used as a “bridge” to heart transplantation. They are temporary pumps that circulate blood, partly taking over the work of the failing heart, allowing the heart to “rest a little,” while waiting for a donor heart. These are not permanent, and are not substitutes for cardiac transplantation. Various ongoing investigations are in progress to develop a small, durable, self-contained, implantable, self-powered, permanent mechanical heart, which could make donor-heart transplantation obsolete in the future. Various sizes of these artificial hearts could then be stored in operating room shelves much like heart pacemakers today, available for implantation anytime. Cardiac surgeons and heart patients alike all look forward to that day, when millions of otherwise hopeless patients around the world could be saved by a two-hour surgical procedure that is even technically easier to do than the tedious coronary bypass surgery.
