Cardiomyopathy – An Overview

A cardiology exam is coming up and you have not studied yet? Indeed, cardiomyopathies are not necessarily among the most studied topics; however, they appear quite often and are actually one of the most common causes of heart insufficiency. Here, you get an overview of important types of cardiomyopathy for exams - easy to understand and a huge time-saver!

Definition and Classification of Cardiomyopathy

As the name says, cardiomyopathy is a myocardial disease, which comes with an impaired systolic and diastolic function. The WHO classifies 5 types on the basis of cardiac changes:
- Dilated (DCM)
- Hypertrophic non-obstructive or hypertrophic obstructive (HNCM or HOCM)
- Restrictive (RCM)
- Arrhythmogenic right ventricular (ARVC) as well as
- So-called unclassified cardiomyopathy.

In addition, primary entities can be differed from secondary, depending on whether solely the myocardium is affected or the pathologies have been generated by systemic diseases.

Dilated Cardiomyopathy

The most common type, having an incidence of 6/100,000, which affects more men than women, is the DCM. Causal processes are usually unknown; however, it is easily identified on the basis of an enlarged, left-ventricular diameter in the echocardiography and a rarefication of cardiomyocytes in microscopic examination.

The patients having symptoms of a heart insufficiency, like i.e. dyspnea or lung edema (left ventricular insufficiency) or blood stasis in the peripheral body (right ventricular insufficiency), should as well always raise the suspicion of a DCM.

Treatment

Consequently, it is treated (correspondent to heart insufficiency) using diuretics, vasodilators, ACE-inhibitors and beta-blockers. This medicinal therapy helps to delay a progression of the disease and lower the risk of sudden cardiac death. If arrhythmic side effects occur, the implantation of cardiac resynchronization systems is indicated additionally. If, in the further course, the LVEF (left ventricular ejection
fraction) falls below 35%, also an **oral anticoagulation** using vitamin K antagonists and an **ICD** is necessary. However, there are asymptomatic patients as well.

**Hypertrophic Cardiomyopathy**

The hypertrophic cardiomyopathy differs from the DCM in pathophysiology and etiology. In over 50% of the cases an **inheritable mutation** (autosomal dominant) can be detected, which either affects the contractile apparatus or the energy metabolism of cardiomyocytes. Subsequently, these are **enlarged and disarranged**.

Already starting in fetuses, it is progressing at varying speed. Often, the myocardium becomes **hypertrophic** after puberty and the left ventricular diameter is regular or narrowed (compare DCM!), which is why the filling volume is reduced. For this reason, the HNCM is a common reason for the **sudden cardiac death** in young athletes.

A special feature of this type is the possible formation of a so-called **dynamic muscular bulge** just below the aortic valve during systole, so that the left ventricular outflow is impaired.

**Treatment of hypertrophic cardiomyopathy**

- B-blockers, verapamil (calcium channel blocker), disopyramide, amiodarone have been found useful
- Beta blockers in high dose is the #1 therapy to be tried
- No pharmacological treatment is known to improve prognosis
- Atrial and ventricular arrhythmias are common and often respond to anti-arrhythmic drug therapy including beta blockade
- Outflow tract obstruction can be improved by:
  - Partial surgical resection (myectomy)
  - Iatrogenic infarction of basal septum (septal ablation with alcohol)
- Implantable cardiac defibrillation (ICD) for patients with risk of sudden death
Among the named therapy approaches for DCM, at this a **Morrow myectomy** or an interventional **TASH** is expedient. The latter describes the identification of an arterial branch that feeds the bulge and a following injection of alcohol. This way muscular mass is devitalized.

Restrictive Cardiomyopathy

The RCM is rather seldom in western countries, however, quite common in tropical regions. Contrary to the DCM, this is a **diastolic malfunction** caused by an increased **rigidity** (meaning reduced compliance) of the heart’s wall due to increased **connective tissue**, which leads to increased pressures in atria and ventricles.

It is hard to recognize by echocardiography, but there are also clinical symptoms of a heart insufficiency. On the basis of this discrepancy, the RCM can be diagnosed.

Common causes are infiltrations of the myocardium, storage diseases, and **endo-/myokarditides**. Here, the Loeffler **endocarditis** is to be named to a special degree, which leaves scars and that way causes the rigidity. In this case, **cortisone** has to be added to the conventional medicinal therapy. Moreover, **excision** of the endocardium belongs to the surgical treatments.

Arrhythmogenic Right Ventricular Cardiomyopathy

The most uncommon type is the ARVC. This is also a genetically-induced and **inheritable** type of cardiomyopathies, which especially comes with ventricular arrhythmia and tachycardia. It can lead to sudden cardiac death.

This is why therapy includes **antiarrhythmic drugs**, **ICD-implantation** and **catheter ablation**. Physical stress must be avoided.

It is important to understand the fundamental pathomechanisms and types of therapy. Indeed, details and numbers can leave behind a good impression; however, don’t lose yourself in details.

Aside from that, the morphological differences between the different types can be memorized quite well by visualization.

**Legal Note:** Unless otherwise stated, all rights reserved by Lecturio GmbH. For further legal regulations see our [legal information page](#).