

ECHOCARDIOGRAM – A WINDOW TO YOUR HEART

AN ECHOCARDIOGRAM IS A DIAGNOSTIC PROCEDURE USED BY CARDIOLOGISTS TO CHECK THE FUNCTION AND STRUCTURE OF the heart. The test uses ultrasound technology whereby ultrasound waves are sent into the chest cavity via a special probe which also receives the return signals. These signals are then reconstructed to produce images of the heart. The ultrasound signals also enable the cardiologist to measure the speed of blood flow through different parts of the heart. These images and measurements are then used to diagnose various heart conditions, assess the severity of disease and devise treatment plans.

The diagnostic procedure is commonly used to assess heart function, especially when there is unexplained breathlessness, tiredness or signs of water retention. In these instances, the patient may suffer from heart failure and the echocardiogram can accurately measure the heart function, check whether the heart chambers are enlarged and whether they are filling and emptying normally. Another typical scenario is when a person is detected to have a heart murmur. It is then necessary to study the structure and action of the heart valves to detect any abnormal narrowing or leakage of the valves.

There are different types of echocardiograms, the commonest being the transthoracic echocardiogram – a painless, non-invasive test which has neither side effects nor exposes the patient to radiation. It is done in an outpatient setting and provides clinically useful information very quickly and reliably. This is done by placing the ultrasound probe on the front of the chest wall, with the patient lying on his or her left side. A special gel is applied on a probe which is then moved over various parts of the surface of the chest wall. It produces moving pictures of the heart, allowing visualisation of all four chambers of the heart (two atria and two ventricles). It also allows measurement of the chamber sizes to detect abnormal enlargement and determine the function of the left ventricle – the main muscle pump of the heart. All four valves of the heart can also be visualised; these are the mitral and aortic valves on the left side and the tricuspid and pulmonary valves on the right side. The measurement of blood flow through the valves is used to detect the narrowing or leakage of the valves. Vital structures such as the aorta (main channel through which blood exits from the heart) and the pericardium (membrane enclosing the heart) can also be examined.

Three groups of heart muscle diseases can be detected on the transthoracic echocardiogram:

- 1. Dilated Cardiomyopathy:** It occurs in young and middle-aged adults and is more common in men than in women. In this condition, the heart chambers are markedly enlarged. The heart is flabby, the muscles are stretched out and thin and the heart function is reduced. Its cause is largely unknown. Cases have been postulated to be due to previous viral infections, toxins such as alcohol, and there is even a type that affects women after they give birth. Other causes include diabetes and thyroid problems.
- 2. Hypertrophic Cardiomyopathy:** It may affect people of all ages and men and women equally. It is due to enlargement of the heart muscle cells causing an abnormally thick muscle wall of the left ventricle. The thickened muscle wall can block the outflow of blood from the heart, resulting in breathlessness, chest pain, giddiness or fainting spells, especially during physical exertion. The abnormal muscles can also produce dangerous heart rhythm. This condition is a common cause of sudden death in young people, especially athletes. Hence it is important to diagnose this condition in people who are about to engage in rigorous physical training. Hypertrophic cardiomyopathy is usually inherited, due to mutation in a gene. Once a patient is diagnosed, immediate family members should be screened.
- 3. Restrictive Cardiomyopathy:** This tends to affect older adults. It is due to the inflammation or deposit of abnormal chemicals resulting in the formation of scar tissues in the heart muscles. The ventricles become stiff and unable to fill up with blood and empty effectively. Some cancer treatments such as radiation and chemotherapy can predispose one to restrictive cardiomyopathy. As cardiomyopathy worsens, the heart weakens and this results in heart failure. Heart failure causes the build-up of fluid in the lungs, legs or abdomen. Patients can become more and more breathless or swollen. Patients are also prone to abnormal rhythms and sudden death. It is important to make the diagnosis early, institute the appropriate treatment and follow-up with the patient through different stages of the disease. Treatment options include lifestyle changes, a restriction in salt and water intake, medications, implanted devices and a heart transplant. ■



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