

Enhanced External Counter Pulsation (EECP)

Overview

Enhanced External Counterpulsation (EECP) is a noninvasive outpatient treatment for coronary artery disease that does not respond to other medical or surgical therapies. It is performed using the EECP device.

How does it work?

To perform an EECP, the patient is asked to lie down on a padded table and three electrodes are put on his/her chest.



Picture Credit: www.sevyam.in

These electrodes are connected to an electrocardiograph which displays data such as the patient's heart's rhythm, blood pressure, SP02 etc.

- During EECP treatment, the blood vessels in the patient's lower limbs are firmly pressed to increase the blood flow to the heart. This wave of pressure is timed electronically to the patient's heartbeat each time so that the increased blood flow is delivered to the

patient's heart at the precise moment of relaxing. The pressure is released when the heart begins to pump again and this tends to lower the resistance in the blood vessels in the legs so that blood can be easily pumped from the heart.

- This procedure also encourages blood vessels to open up smaller channels that become extra branches of the existing blood vessels. These channels or collaterals eventually become "Natural Bypass" vessels that provide adequate blood flow to the heart muscles. This helps to bring about the relief of angina symptoms.

What is the Basic Principle of EECPT Treatment?

One of the best ways to supply oxygen to the oxygen-starving areas is by increasing the amount of blood returning to the heart. With more oxygen available, the heart functions more efficiently and therefore reduces chest pain. **EECPT** therapy has been shown to significantly increase LVEF (Left Ventricular Ejection Fraction) and significantly reduce the resting heart rate.

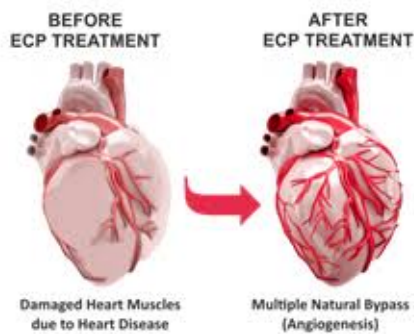
Left Ventricular Ejection Fraction as shown in a routine 2D Echo: (EF= Ejection Fraction)

Normal EF: 60%

Minor Heart Attack EF: 50-55%

Major Heart Attack EF: 30-49%

Massive Heart Attack EF: 15-20%



Picture

Credit:<http://www.drmorepennow.com/blogs&ncid=1>

How Often Do Patients Need To Undergo This Procedure?

Patients who are accepted for EECPP treatment must undergo 35 hours of therapy and it is administered 1-2 hours a day, five days a week, for 7 weeks.

In Which Cases Can EECPP Be Used?

Some common conditions that can be treated using EECPP include chronic stable angina, coronary artery disease, and high blood pressure. Most recently, the Food and Drug Administration (FDA) has approved EECPP for the treatment of congestive heart failure as well.

This technique of treatment may be appropriate for patients who are not eligible for non-surgical interventional procedures such as balloon angioplasty, stent placement, rotablation, atherectomy, or brachytherapy. It may also be used for patients who do not qualify for surgical treatments like coronary artery bypass graft surgery.

Are There Any Contraindications for this Procedure?

Yes, there are many contraindications for this procedure, these include:

- Some valve diseases
- Any surgical intervention within 6 weeks

- Cardiac catheterization within 1–2 weeks
- Severe pulmonary disease
- Presence of an abdominal aortic aneurysm
- A local infection or vasculitis of the extremities
- Uncontrolled arrhythmias
- Presence of a burn, open wound, or bone fracture on any limb subject to ECP treatment.
- Bleeding disorders
- Severe hypertension, uncontrolled congestive heart failure
- Significant blockages or blood clots in the leg arteries
- A heart rate higher than 120 beats per minute
- Current or recent Deep Vein Thrombosis/ DVT
- Severe aortic insufficiency or an abnormal narrowing (stenosis) of the aortic valve opening (a result of a weak valve or a tighter, smaller valve)
- Severe vascular disease in the leg vessels
- Pregnancy

On a Concluding Note

For over two decades, EECp procedure has been used in the treatment of angina and today, its efficacy and safety is supported by research published in several publications. It is approved by the FDA for the treatment of chronic or unstable angina and in patients with congestive heart failure. EECp treatment has been associated with improved exercise tolerance and myocardial perfusion, evidenced by nuclear imaging and Positron Emission Tomography(PET). However, some more research is still required to shed additional light on the mechanism of action and also verify the long-term symptoms in patients with unstable angina pectoris and those with congestive heart failure.