

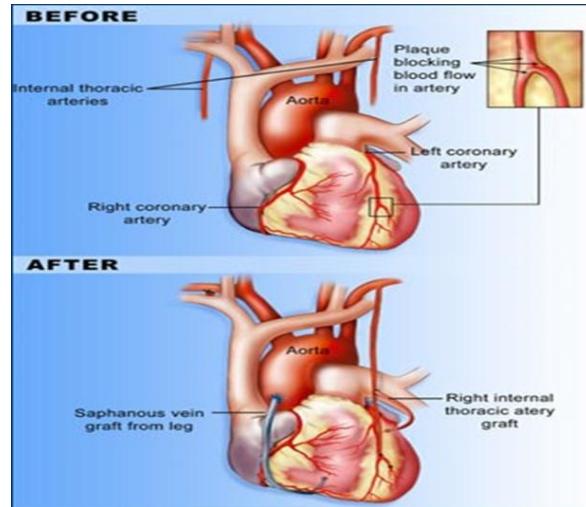
Transmyocardial Laser Revascularization

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Abstract- Bypass grafting surgery is not the only solution to coronary heart disease; laser revascularization is also used as treatment to provide additional blood paths in the heart. Late hypotheses and experiments have provided and provoked new ideas in how the chambers and ventricles of the heart are directly connected. Transmyocardial Laser Revascularization is leading the way to new discoveries and advances in myocardial studies.

I. Introduction

Coronary Heart Disease is a disease of the coronary arteries in the heart. The coronary arteries provide oxygen-rich blood to the heart. Those who develop CHD build up plaque in the arteries which reduces the blood's flow or even causes backward flow. The part of the heart muscle that the blocked off artery is supposed to provide blood to becomes dead. Patients with this disease suffer from chest pain and breathing problems, making it difficult to exercise or participate in activities. It is recommended by doctors to have Coronary Artery Bypass Graft Surgery to help with the disease but not all patients are suitable for this surgery. Depending on some patients' health conditions or the affects the disease has already had on the heart, CABG surgery may be a risky or even impossible option. Although, Transmyocardial Laser Revascularization; also known as TMLR, may be the answer to CHD therapy.



II. Methods

Transmyocardial Laser Revascularization is done while the heart is still beating. The latest CO₂ or YAG Laser makes 20-40 (1mm) wide channels in the left ventricle of the heart through an incision to the left side of the chest. The left ventricle is the target site due to its thickness because there is a less chance of injury. A consultation with the patients' doctor will have to take place before the surgery as well as a few tests. The procedure does not call for a sternotomy but an anesthesiologist will be on site, the patient's heart rhythm will be monitored, and tubes and I.V's are necessary. The channels made allow blood to flow to parts of the heart that are starving due to blocked arteries. CABG and TMLR can be done simultaneously. According to randomized trials those who have both procedures have 95% success rate; 89% for patients whom just have a CABG.

III. Results

Post-surgery recovery is not as long compared to Coronary Artery Bypass Graft Surgery. The patient would have to stay in the hospital from 4-7 days, rest and limit activity, have a few weeks of medical leave from work. The effects TMLR has had on the body is the destroying of nerve fibers and denervation. Although these effects help with chest pain and can create new vessels. There are no long term or intermediate results but over a short period of time patients show that TMLR is successful at easing CHD symptoms. Patients are able to participate in activities that would usually cause pain just 3 months after TMLR. They also find it easier to breathe and some even stop their daily CHD medicines. A year after the revascularization, 80%-90% of the patients still feel good and have a lower risk of heart attack.

IV. Discussion

Physicians of the 16th century and the late 1800's have experimented on the heart and documented the direct communication of the ventricles and the chambers. The circulatory system of the heart is still able to function even if another area is blocked which is the concept of TMLR. This hypothesis comes from the theory of the alligator's circulatory system. Randomized tested were first used and very successful in the early years of this breakthrough in coronary heart technology.

To prevent injury to the heart, the targets for the channels to be made are in the thick lower left chamber of the heart (left ventricle). Blood is now able to reach the left ventricle and flow to starving parts of the heart. TMLR is leading the way to new methods and technology in curing CHD as well as new vessel growth.

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