Managing Refractory Angina in Absence of Options

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Professor Shmuel Banai is an interventional cardiologist at the Tel Aviv Medical Center, affiliated with the Tel Aviv University Sackler School of Medicine, Israel. He is interested in vessel wall biology and physiology and in exploring therapies and interventions to obstructive diseases of the heart blood vessels. Professor Banai has recently validated a new heart device for the treatment of refractory angina.

To begin, can you tell the readers how did you start your career in medical research and why did you choose Cardiology as a domain?

During the years 1988 and 1992, I was a visiting research fellow at the Cardiology Branch of the National Heart, Lung and Blood Institute of the National Institutes of Health in Bethesda, USA. There, under the guidance of Dr. Stephen Epstein and with Dr. Ellis Unger, who was an early stage of my career in Cardiology research. Since I was a medical student, I have been fascinated by the physiology of the heart, the amazing engineered organ that is in constant movement to pump the blood throughout our bodies. Understanding the mechanistic events underlying heart diseases and developing solutions to circumvent them has been gratifying to me. In addition, I have a particular empathy for heart disease patients and their families, who are fighting some life-threatening disease conditions.

As we will come to later, you have recently demonstrated the benefits of a new heart device in the treatment of refractory angina. But first, can you explain what is refractory angina and to what extent it affects the patient’s health and lifestyle?

Angina is a common clinical problem, which results from the insufficient blood flow to some regions of the heart muscles (ischemia). This often occurs as a complication of coronary artery disease, in which one or more of the coronary arteries, which nourish the heart, are narrowed. The majority of patients with angina are estimated to suffer refractory angina. With the current lack of curative-options, managing cases of chronic refractory angina has been a tough challenge for cardiologists.

Angina pectoris – better known as angina – is a clinical symptom in which the patient suffers chest pain accompanied by a feeling of tightness in the chest and shortness of breath. Angina symptoms typically manifest in patients suffering shortage in the supply of oxygen-rich blood to a coronary artery, leading to a coronary artery disease. The latter involves the accumulation of atheroma (a waxy substance composed of cholesterol and cells) within the walls of the coronary arteries, leading to a significant narrowing of the lumen. Patients with atherosclerosis of the coronary arteries are at a high risk of experiencing heart attacks, which is potentially life-threatening. Patients with angina experience marked limitation in their ability to perform physical activity and have a poor quality of life. Those patients continue to have debilitating symptoms that keep them from climbing stairs or even walking longer than 100 feet, Professor Banai said.

An early study exploring the validity of the Reducer™ was conducted by Professor Banai and his research team in 2001, on a limited number of refractory angina patients who were not suitable candidates for revascularisation procedures. The study gave the first evidence on the safety and efficacy of the Reducer™, which resulted in no adverse reactions and relieved the angina symptoms in the majority of the patients over a six-month period of follow up. However, despite the promising outcomes, a subsequent study was required to confirm these preliminary results in a larger group of patients, while taking stronger control measures to ensure their reliability. Hence, Professor Banai, together with a panel of international collaborators has conducted a large clinical growing, especially in aging populations. For example, in the United States, 1,000,000 people are estimated to suffer refractory angina.

What is the nature of this device, and how does it alleviate refractory angina?

The Coronary Sinus reducer is a balloon-expandable hourglass shaped stainless-steel mesh, developed by the specialty medical device company, Neovasc Inc. The Reducer™ is designed for implantation in the coronary sinus, the terminal vein which drains blood out of the heart, to create a narrowing in the sinus. As a result, coronary sinus blood flow is elevated. These events favours the redistribution of oxygenated blood through the coronary arteries towards ischemic areas of the heart muscles, according to Professor Banai. The implantation of the Reducer™ is performed via a catheter introduced through a large vein at the right side of the neck by a painless procedure under local anesthesia.

Refractory Angina

The COSIRA trial, which was designed to evaluate the safety and efficacy of the Reducer™, is currently ongoing in Europe. Patients with severe chronic refractory angina, confirmed for heart ischemia, and have ‘no options’ for other surgical interventions are being enrolled.
The Reducer™ device offers a safe and efficacious therapeutic option for alleviation of refractory angina in patients who are neither responsive to therapy nor admissible to revascularisation procedures.