

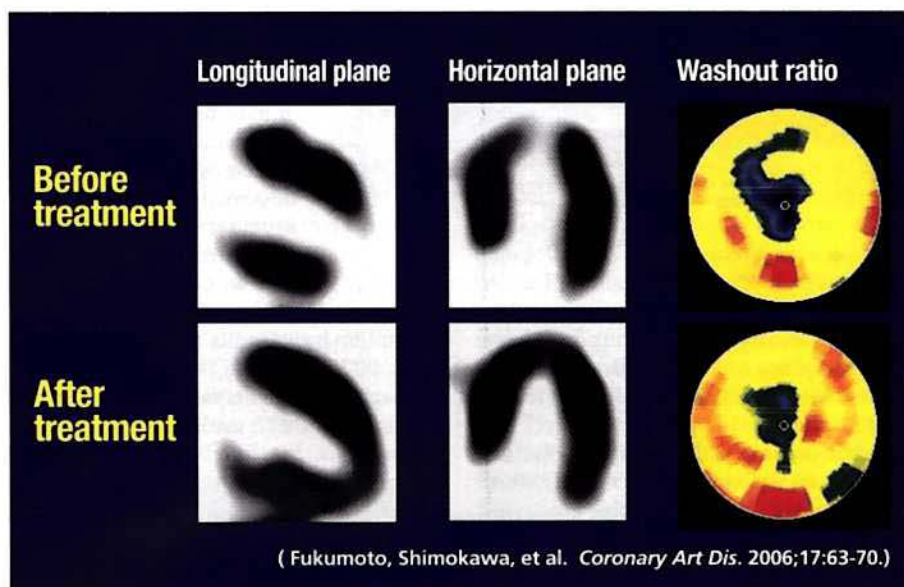
“Prodding” Relief from Angina

An innovative method for non-invasive treatment of ischemic heart disease recently developed in Japan is already starting to find widespread use around the world. **Chris A. Pomeroy** reports.

Imagine being able to dispense of the need for invasive heart surgery. This is the challenge posed by Dr. Shimokawa Hiroaki, professor and chairman of the Department of Cardiovascular Medicine at the Tohoku University Graduate School of Medicine. The means proposed by Dr. Shimokawa is the use of low-energy shock waves, currently used for example to break up “stones” in the urinary tract, in lower energy to stimulate damaged areas in the heart of patients suffering from angina pectoris into effecting “self repair.”

Dr. Shimokawa, who has studied abroad and keeps an eye on global trends, learned of an overseas research finding some years ago, indicating that endothelial cells can generate nitric oxide that stimulates angiogenesis upon stimulation by application of low-energy shock waves. He tried out the application on an animal model of angina pectoris and found that indeed this was the case for the heart, provided the application area for the low-energy shock waves was pinpointed.

As there are many patients suffering from angina pectoris, basically the “clogging” of coronary arteries of the heart resulting in damage to the cardiac muscle, Dr. Shimokawa focused on this ailment. Conventionally, angina pectoris is treated through prescription of nitroglycerine—which loses efficacy as a treatment after extended use—or for severe cases through coronary intervention with a balloon/stent or open-heart bypass surgery. For the new



Site where myocardial blood flow was inadequate (the two narrow gaps and the blue area in the upper images) is normalized after a month's treatment using ultrasonic shock waves.

approach, Dr. Shimokawa sought to gain help from manufacturers.

Unfortunately, Japanese medical equipment manufacturers were not open to such ideas and also due to the fact that European companies hold the basic patents related to shock waves, he finally decided to join forces with Swiss company Storz. Working together, the Shimokawa-Storz team has obtained excellent results for the angina pectoris efforts.

Dr. Shimokawa has since then garnered support from the Ministry of Health, Labour and Welfare (MHLW) to further his investigations and conducted clinical research on humans. Good outcomes have been reached for the patients, and by screening out placebo effects these have proven that low-energy shock wave therapy is scientifically sound.

Other medical teams working around the globe like those in

Germany and Canada have reproduced the Shimokawa findings, and the Japanese research work has thus become the standard upon which cardiac shock wave therapy is being carried out worldwide.

Official approval is seen being granted by the Japanese government to the Shimokawa approach as a non-invasive medical treatment for angina pectoris patients. However, Dr. Shimokawa expects the application of low-energy shock wave treatment to expand to use in ameliorating other medical ailments, in particular for problems related to the internal organs, these now being in need of invasive surgery.

Dr. Shimokawa notes that even if pluripotent cell research were to become successful and widespread, there would still be the need for invasive surgery in order to implant pluripotent cells if the area to be repaired is located deep inside the body. Considering that the MHLW has found the innovative method used for angina pectoris treatment worthy of support, it appears certain that other applications will be explored in the near future for shock wave therapy. ■



An angina pectoris sufferer receives the new low-energy shock wave treatment.

Chris A. Pomeroy is a journalist and columnist specializing in science and technology.