Spinal Cord Stimulation (SCS) for Chronic Refractory Angina and other Ischemic Syndromes: When Established Methods fail; can the Nervous System Protect the Heart?

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Angina pectoris often serves as a warning signal for endangered cardiac tissue and elicits a very strong emotional component. This type of pain, in general, is a treatable symptom; however, in some patients angina becomes refractory to conventional therapies. To provide relief for these patients, chronic refractory angina has been treated successfully since the mid-eighties using SCS with the electrode positioned at a high thoracic (T1-T2) level. This treatment has been employed at several cardiology centers after several studies showed that SCS did not eliminate signs of critical myocardial ischemia, did not increase the number of arrhythmic episodes, did improve left ventricular function, and produced fewer side-effects than many pharmaceutical regimens. However, the exact mechanisms and neural network that contribute to these beneficial effects have not been elucidated. The International Working Group on Neurocardiology has been working together to explain how the central and cardiac nervous systems interact to provide the results that contribute to successful treatment using SCS. The presentation will include a discussion about the modulation of noxious information using SCS to treat patients with refractory angina pectoris. SCS may depend on the hierarchical control of the central nervous system, specifically, the spinal cord, to modulate the function of the final common neuronal pathway of the heart, the intrinsic cardiac nervous system, in the presence of ischemic challenge. Thus, SCS might be utilized as a cardioprotective adjunct to pharmacotherapy that reduces the chance that myocardial ischemia will lead to generalized and potentially life-threatening rhythm disturbances as well as angina pectoris.