An Oscillatory Atherectomy Device Incorporating a Novel Burr Design and Torque Limiting System for the Safer Treatment of Advanced Coronary Artery Disease

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Technology description

Unmet Need

Cardiovascular disease is the leadind cause of death globally and the most significant cost contributor to the health care system. When coronary plaques become heavily calcified - which is typical in older patients with long-standing coronary disease and those with co-morbidities such as chronic kidney disease - the compliance of the vessel is reduced to a point at which angioplasty is no longer effective. Currently, these heavily calcified stenosis are treated with an aggressive intervention known as coronary athrectomy, which partially ablates and modifies the compliance of the atherosclerotic lesion so that angioplasty can be successful performed.

Technology Overview

The current standard of care for atherectomy is Boston Scientific's Rotablator, a diamond-studded burr that spins concentrically on the axis of an intra-arterial guidewire. Although this device is effective in ablating plaque, two of the most frequest and serious complications that arise from atherectormy are perforactions and dissections of the vessel wall, leading to internal bleeding and myocardial infarction. Studies indicate combined perforation and diseesction rates ranging from 5% to 8%. Johns Hopkins inventors have developed a system that is designed to allow the device to operate with significantly reduced rate of vessel wall damage while providing an equally or more effective tool in the ablation of calcified plaque. In contract to the rotational motion of the Rotablator, the Plaqate system utilizes mechanical oscillation to ablate calcified plaque.

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