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Low-Dose Ct Perfusion Technique

Tech ID: 32060 / UC Case 2015-969-0

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

- » **Imaging**
 - » Medical
- » **Medical**
 - » Diagnostics
 - » Disease: Cardiovascular and Circulatory System
 - » Imaging
 - » Screening
- » **Research Tools**
 - » Animal Models

BRIEF DESCRIPTION

Coronary atherosclerosis (a thickening of the arterial wall) is correlated to the occurrence of cardiac events; therefore, its correct and early diagnosis is paramount in the prevention and treatment of coronary artery disease.

Researchers at UCI have developed an innovative method for assesses coronary artery stenosis and microvascular disease that is both accurate and non-invasive.

SUGGESTED USES

- » Diagnosis of vascular-related hearth conditions, including ischemia (inadequate blood flow), atherosclerosis (artery hardening) and stenosis (blood vessel narrowing).
- » Monitoring treatment efficacy and patient progress

FEATURES/BENEFITS

Effectiveness: can more accurately determine condition of the hearts vessels.

- » Quantifiable results, not subject to visual estimation
- » An improvement over traditional CT angiography methods, which overestimate condition severity

Safety: lower dose and less risk of radiation, as compared to current dynamic techniques, which require high doses to be effective. Lower dose methods are particularly advantageous for patients with renal dysfunction.

Versatility and adoption: This technique does not required the use of new contrast agents or devices, and is a method that can be applied to many organs, including the heart, brain, lung, and kidneys.

TECHNOLOGY DESCRIPTION

Coronary artery disease is the leading cause of death in the USA (about 500,000 deaths per year). Coronary computed tomography (CT) angiography is a non-invasive technique used to visualize the heart's blood vessels and find indicators of disease. Other techniques currently employed to diagnose coronary artery present many drawbacks, such as invasiveness, inaccuracy, and lacking the ability to identify the vessels responsible for ischemia (inadequate blood flow). One such method, traditional CT perfusion scanning, is used to observe the passage of an imaging agent through the blood vessels of an organ. While this technique gives a functional assessment of heart, currently, it requires an extensive, potentially harmful, dose of radiation (the imaging agent) and multiple volume scans of the whole organ to obtain data, without offering in return an accurate estimation of the actual perfusion.

The new CT perfusion technique developed at UCI is an adapted perfusion method that obtains blood flow data with lower radiation doses and less scans, in a similar non-invasive manner. This approach applies novel perfusion calculations that rely on blood flow and tissue mass. Using this technology, medical professionals will be able to more accurately provide both anatomical and physiological information about the heart, and correctly diagnose heart conditions.

STATE OF DEVELOPMENT

Simulation ("phantom") studies using a device consisting of a reservoir system, pulsatile pump, and anthropomorphic chest "phantom"

In vivo studies in swine.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,201,321	02/12/2019	2015-969

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