

Intravascular Device and Method for Tissue Ablation for the Treatment of Pain and Cancer

Disease Area: solid tumors and pain

Application: surgical device

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Invention Description:

The invention is a system for ablating nerve tissue for pain treatment and ablating tumor tissue for treating cancer, where both the nerve tissue and tumor are unresectable because of their closeness to blood vessels. The system comprises a catheter to carry a probe to the blood vessel capable of simultaneously delivering two different frequencies of electromagnetic radiation to the nerve tissue and the tumor. The invention relates to systems and apparatuses that deliver a first radiation frequency to a target nerve near the blood vessel and a second radiation frequency to an abnormal growth near the blood vessel. The two different frequencies can be a radiofrequency and a microwave or two different microwave frequencies. The first radiation frequency is configured to neuromodulate the target nerve. Neuromodulation can be accomplished using radio frequencies and/or microwave frequencies. The particular frequency applied is determined based on factors such as the distance of the target nerve from the blood vessel, the composition of tissue and fluids between the blood vessel and the target nerve, the desired energy imparted to the target nerve and/or the composition of blood and tissue within the tumor. The second radiation frequency is configured to inhibit further growth of the tumor and reduce adverse risks to the patient through necrosis of the tumor. Necrosis of a tumor can be accomplished using microwave frequencies. The particular microwave frequency applied is determined based on factors such as the distance of the tumor from the blood vessel, the composition of tissue and fluids between the blood vessel and the tumor, and/or the composition of fluids and tissue within the tumor.

Advantages:

The advantage of the inventive ablation systems and probes is that they can simultaneously deliver two different frequencies that can simultaneously ablate nerve and tumor tissue to treat pain and the cancer. This technology would be used to treat tumors otherwise unresectable and to treat intractable pain. Current modalities include radiation therapy, and or injection of local anesthesia either percutaneously, laparoscopically or endoscopically. This invention would be used in place of or complimentary to existing modalities.

Ablation technologies are divided into thermal and non-thermal ablation technologies. Microwave and radiofrequency ablation are thermal ablation technologies. Other thermal ablation technologies include radiofrequency, laser, ultrasonic and others. All work by raising the temperature of tissue to the point where it is destroyed. The market size in 2011 for all ablation technologies was \$7.5 billion and is growing at 10.5% a year.

Intellectual Property Situation: A US provisional patent application is pending.

Follow up: Please contact Michael Caggiano at michael.caggiano@jefferson.edu or +1-215-955-6862 in The Office of Technology Transfer and Business Development at Thomas Jefferson University, citing Jefferson docket number (WAL_PAU.010).