Image Guided Surgery for Pancreatic Cancer

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Technology description

Invention

The technology is the combination of targeted microbubbles to cancer cells and a novel imaging device to accurately and rapidly assess the surgical margin for presence of unseen cancer in the operating room. The device is a portable combined multi-photon imaging (MPI) and optical coherence tomography (OCT) imaging device to visualize tissues with attached targeted microbubbles. MPI provides sub-cellular resolution and OCT provides rapid, wide-field, sub-surface imaging.

Background

Pancreatic cancer is the 10th most common cancer and 4th highest cause of cancer death. The presence of tumor at the surgical margin is the largest risk factor of poor survival. Surgeons currently palpate for a soft, normal area of the pancreas. Microscopic cancer cells cannot be palpated. The invention solves this problem by a novel imaging device with targeted-microbubble technology to confirm or identify residual cancer in real-time.

Application area

--The invention can be applied as a niche device for image guided surgery options in pancreatic cancer.
--The methodology is not limited only to pancreatic cancer and can be applied to general oncologic surgery.

Advantages

--Ultrasound is the traditional method to image microbubbles.
--MPI can detect microbubbles with higher resolution.
--MPI does not require a liquid interface between the detector and tissue surface, making it suitable for the operating room.
--Current methods involve analyze a single frozen section biopsy for cancerous cells several days post-surgery.
--The invention can be used in real time during the operation.
--The invention analyzes the entire cut surface of the pancreas.

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