Real-Time Tissue Assessment During Surgical Procedures

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ABSTRACT

Researchers at the University of California, Davis have developed a novel method and device that allows removed tissue to be examined during the surgery to ensure that the excised tissue has 'clean margins'.

FULL DESCRIPTION

When surgically excising a tumor, it is critical to remove some normal tissue surrounding the growth to ensure that the excised tissue has all of the tumor material removed. To determine if all of the cancer is removed, a radiologist may insert a clip in the breast during biopsy to mark the tumor. A guide wire (or multiple guide wires) may be inserted into the breast to help the surgeon locate the targeted tumor during surgery and a subsequent two-dimensional X-ray radiograph, to look for tell-tale calcifications of the removed tumor, are routinely used to evaluate the completeness of tumor removal. This can take up to two days and out of all the patients who have had lumpectomies to remove breast cancer, 20-40% of the tissue margins are found to test positive for tumor cells. These patients require follow up surgeries which increased the risk of further complications and subject them to additional emotional and financial stress.

Researchers at the University of California, Davis have designed a combined PET and CT specimen imager that allows the imaging of the excised tumor within the surgical suite. Ultra-high resolution images are generated to allow instant assessment by a radiologist. The results may be used to guide the complete removal of the tumor so no follow-up surgeries are required. Using PET for imaging excised tissue will allow for clearly delineated sample margins and greater success rates for complete excision of tumors.

APPLICATIONS

- Clinical
- Research

FEATURES/BENEFITS

- Lower cost to patients by reducing need for repeat surgeries
- Reduction in patient anxiety
- Lower risk of complications

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,632,187	04/25/2017	2013-861
United States Of America	Issued Patent	9,557,281	01/31/2017	2011-754

INVENTORS

- Badawi, Ramsey D.
- Cherry, Simon R.
- Godinez, Felipe
- Judenhofer, Martin
- Poon, Jonathan
- Qi, Jinyi

OTHER INFORMATION

KEYWORDS

real-time, tissue assessment, surgical procedure, tumors, excised tissue, PET, CT

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Imaging**
  - Medical
- **Medical**
  - Devices
  - Disease: Cancer
  - Imaging
  - Screening

RELATED CASES

2013-861-0, 2011-754-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Techniques for Improving Positron Emission Tomography Image Quality and Tracking Real-Time Biological Processes
- Quantitative Multiparametric PET/CT Imaging for Nonalcoholic Fatty Liver Diseases
- Auto Single Respiratory Gate by Deep Data Driven Gating for PET

- A Combined Time-Walk and Timing-Shift Correction Method for Dual-Ended Readout TOF-DOI PET Detector
- Unsupervised Positron Emission Tomography (PET) Image Denoising using Double Over-Parameterization

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