Ultrasonic Method for Determining Tissue Pathology and Assessing Tumor Margins

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Technology description

Surgeons performing cancer, biopsy, or other clinical treatments can determine whether additional tissue needs to be removed in order to acquire a cancer free margin.High-frequency ultrasound is sensitive to tissue properties and structure at the microscopic level, and thus is specifically useful for detecting microscopic cancer in surgical margins. This system and device for high-frequency ultrasonic measurement allows real-time determination of the of tissue pathology.

In particular, the use of high-frequency ultrasound for the intraoperative assessment of tumor margins in breast conservation surgery would significantly improve the quality of care.Existing methods for pathology analysis of surgical margins involve a lengthy procedure of fixing, staining, and examination of multiple tissue slices, a process which is not complete until 2-4 days following surgery. The use of high-frequency ultrasound would allow surgeons to assess tumor margins in the operating room, resulting in better outcomes and less need for re-excision surgeries. Approximately 150,000 women opt for lumpectomy when diagnosed with breast cancer.Failure to obtain negative margins during surgery results in the need for additional surgery for 30-50% of patients, at an additional cost of $230M/year in the US alone.This invention has great potential to reduce the need for additional surgeries and improve patient outcomes by allowing the surgeon to quickly assess tumor margins during the surgical procedure.The potential market for application in breast cancer alone is estimated at $75M annually.

Advantages

The high spatial resolution of ultrasonic scans permits a high degree of accuracy for tissue classification.

Ex vivo assessment of tumor margins would allow the surgeon to make adjustments during surgery, improve patient outcomes, and reduce the need for additional surgeries.

This approach could also improve surgical accuracy and outcomes for other cancer types, including liver, pancreas, colon, or prostate cancer.

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