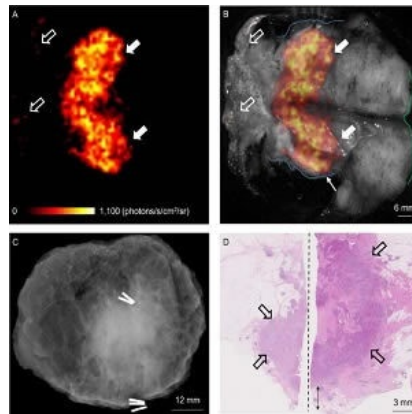




Imaging Technique Could Guide Breast-Conserving Surgery



In a first-in-human study seen as expanding the application of nuclear medicine, British researchers have developed a low-risk technique for intraoperative assessment of tumour margins in breast-conserving surgery. The technique, called Cerenkov luminescence imaging (CLI), combines optical and molecular imaging for detecting light emitted by the PET radiotracer F-18-fluorodeoxyglucose (F-18-FDG).

CLI's high-resolution and small-sized imaging equipment make it a promising technology for assessing tumour margins during breast-conserving surgery (BCS), according to the study published in *The Journal of Nuclear Medicine*. BCS is the primary treatment for early-stage breast cancer, but more accurate techniques are needed to assess resection margins during surgery to avoid the need for follow-up surgeries.

"By accurately assessing tumour resection margins intraoperatively with CLI, surgeons may be able to completely clear the cancer with a single operation, thereby reducing the number of breast cancer patients requiring a second, or even third, surgical procedure. Ultimately this could lead to improved patient care and reduced healthcare costs if confirmed in larger clinical studies," explains Arnie D. Purushotham, MD, professor at King's College London, UK.

This study included 22 patients with invasive breast cancer. F-18-FDG was injected 45-60 minutes before surgery. Immediately after the excision of tumours, specimens were imaged intraoperatively in an investigational CLI imaging system. The first 10 patients were used to optimise the imaging protocol; the remaining 12 were included in the analysis dataset.

Results showed that 10 of the 12 patients had an elevated tumour radiance on CLI, and agreement among raters on margin distance was good. Sentinel lymph nodes, which used technetium-99m to facilitate identification, were successfully detected and biopsied in all patients.

A randomised controlled trial will evaluate the impact of the CLI technology on re-excision rates. "The feasibility of intraoperative CLI as shown in this study, in combination with the wide applicability of F-18-FDG across a range of solid cancers, provides a stepping stone for clinical evaluation of this technology in other solid cancer types that also experience incomplete tumour resection due to close or involved margins," Dr. Purushotham notes.

Source: [Society of Nuclear Medicine and Molecular Imaging](#)

Image Credit: A. D. Purushotham, MD, King's College London, UK

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