New technique offers closer study of tumours

It may allow doctors to be more precise when removing cancer tissue during surgery

Timothy Goh

Researchers here have developed a new technique to examine tumours more closely that may lead to more precise surgical operations.

It has been generally understood that cutting away cancerous tissue along with a margin of healthy tissue will reduce the chances of the cancer returning, but Dr Glenn Bonney, 41, noticed something odd in 2016 after operating on the tumours of two patients.

The patient with a larger amount of healthy tissue removed saw the cancer return in just six months, while the disease did not recur for the patient who had only a small amount of healthy tissue removed.

He had also noticed many similar cases reported in medical publications and among his other patients.

This led the consultant at the National University Hospital’s division of liver and pancreatic surgery to question whether the conventional understanding of the margins between cancerous and healthy tissues might be too simplistic, and if it might be possible to study them more closely.

So he and a team of researchers from the National University of Singapore turned to a technique called mass spectrometry imaging.

To observe the margins, doctors traditionally have to stain tissue samples and look at them under a microscope. But this would give them information only at a cellular level, which is not very detailed.

More detailed analysis could be performed by pulverising a tumour and inserting it into a mass spectrometer, but this would not allow researchers to accurately reconstruct and analyse it.

Dr Bonney’s method is more precise. A slice of tissue where the cancer and healthy zones overlap is inserted into the mass spectrometer, which fires lasers at it, breaking it down without changing its molecular arrangement. This allows for an accurate digital reconstruction of the tissue and finer analysis in just 45 minutes, down from the three to five days taken by tissue staining. Applying more precision science means that we can actually change the way we operate, and not necessarily do things that are so big to patients,” he said.

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(From far right) NUH consultant Glenn Bonney, who came up with the new technique, with some of his research team members from NUS – PhD student Claire Chew, application scientist Gaelin Looi, and iHealthTech laboratory manager Joseph Ho. ST PHOTO: KELLY HUI