

Cytosponge



Image credit University of Cambridge/Mayo Clinic.



Researchers at the MRC Cancer Cell Unit in Cambridge have developed a simple and inexpensive test called the 'Cytosponge' that can detect Barrett's oesophagus, a condition that affects around 1-2 per cent of adults in the UK. In these people, the multiple layers of flat cells that usually line the oesophagus become a single layer of rectangular cells more like those in the intestine. The change in these cells is caused by acid reflux – stomach juices irritating cells of the oesophagus. The changed cells have an increased chance of becoming dysplastic (abnormal) and they are more likely than other cells to develop into cancer. Research suggests that 3-10 in 100 people with the condition will go on to develop cancer of the oesophagus over their lifetime.

Barrett's oesophagus is usually diagnosed by having a biopsy during an endoscopy. However, enduring an endoscopy can often be uncomfortable and does present some risks. It is also not practical or necessary for everyone experiencing symptoms of heartburn or indigestion to have an endoscopy. An endoscopy costs around £600 in comparison to the Cytosponge test which would cost approximately £25. Unlike an endoscopy, Cytosponge can easily be used in GP surgeries and does not require sedation.

The Cytosponge Test consists of a spherical sponge contained within a dissolvable capsule. This is attached to a piece of string that is swallowed with water. The device then dissolves in the stomach to expand into a sponge-like mesh 3cm wide.

On removal, the sponge collects cells for molecular analysis to identify abnormal cells.

The initial MRC study assessed 500 people aged between 50 and 70. The researchers tested whether the device gave an accurate diagnosis and could be used by doctors as a practical screening method for Barrett's. Virtually all patients (99 per cent) were able to swallow the device without a problem. The test uncovered that three per cent had Barrett's oesophagus.

Cancer Research UK has since funded a larger-scale multi-centre study to follow up these findings and found the test to be well-tolerated, safe and accurate. The trial invited 1,100 patients, 600

with confirmed Barrett's and a further 500 with acid reflux and persistent heartburn (but who had not been tested for Barrett's), to both swallow the Cytosponge and to undergo an endoscopy. When the two methods were compared, the Cytosponge had similar accuracy rates in diagnosing Barrett's as an endoscopy. More than nine in 10 patients were able to successfully swallow the capsule and many said they preferred it to an endoscopy. Diagnosing patients with Barrett's oesophagus means they could be treated for the condition, potentially lowering their risk of oesophageal cancer. Treatments range from drugs to reduce stomach acidity, to removal of abnormal patches of cells during an endoscopy. *contd...*

The team are now aiming to identify which patients with Barrett's oesophagus are more likely to develop cancer, by looking for tell-tale markers in the cells captured by the sponge, such as known cancer-related red flags like mutations in the p53 gene, which seem to occur as Barrett's develops into oesophageal cancer.

Professor Rebecca Fitzgerald who developed this test at the MRC Cancer Cell Unit said:

“We've completed one trial and we hope that another one will soon be under way. Our plan is to see whether we can roll the Cytosponge test out in GP surgeries across the UK. I'd like to see it become part of an early diagnosis programme for Barrett's oesophagus.

This work to improve early diagnosis of Barrett's oesophagus could not have happened without support from the MRC and Cancer Research UK. This is an example of how taxpayer-funded research organisations and the charity sector can work together to advance scientific discoveries from the laboratory towards the clinic.”

