Robotic claws clear cancer cells without cutting open patient

By Feng Zengkun

Scientists in Singapore have created a set of crab-like robotic claws that can remove cancerous tissue without cutting open the patient.

The device has two miniature arms that slice away the diseased area. They are placed on the end of a wire called an endoscope, which carries a tiny camera and can be inserted through the mouth, nose or other orifices.

This means there will be no scarring, and the surgery will take a fraction of the usual time. Patients who undergo the operation will not need a general anaesthetic, and can even go home shortly afterwards.

"The patient will feel only minor discomfort," said one of the device's creators, Dr Louis Phee of Nanyang Technological University.

He and National University Hospital's Dr Lawrence Ho came up with the idea during a seafood dinner in 2004. They were dining with Hong Kong surgeon Sydney Chung, who suggested that they model the device on a crab's pincers because of their efficiency.

Since then, the technique has been used on five early-stage stomach cancer patients in clinical trials in Hong Kong and India.

The doctors plan to test the device on a Singaporean patient for the first time next month.

The entire set of "claws" is 1.5cm wide. One arm is equipped with a pincer to hold the cancerous tissue, while the other has a hook to slice it off and stop the bleeding.

Dr Phee, who heads the university's mechatronics and design division, said surgeons are likely to need no more than a few days of training before they can use the technology.

By contrast, laparoscopy, which is currently the least-invasive technique, requires more training and practice.

Also known as keyhole surgery, it involves thin instruments being inserted through a small cut in the body. But while the method has led to a shorter recovery time and reduced pain, surgeons must be skilled to manipulate the instruments through the narrow hole with limited room for manoeuvre.

Another advantage of the robotic arms is precision, said Dr Ho, clinical director of the hospital's endoscopy centre.

"Robots can execute very fine movements without trembling, unlike human hands," he added.

However, the technique cannot be used for late-stage cancer patients as the tumours would have spread too deep.

The doctors set up a company last October and hope to make the device commercially available within three years.

They said the robotic arms could carry different tools in the future, allowing them to be used for jobs such as stitching up internal wounds.

In Singapore, stomach or gastric cancer is the third most common cancer among men and the fifth most common among women.