**Precise breast cancer surgery**

Using real-time ultrasound scanning in the operating theatre, a surgeon can accurately locate the cancer lump in a breast so that only the necessary amount of tissue is removed.

Breast surgery to remove a cancerous lump entirely while leaving as much of the breast as possible can now be made more precise with the use of ultrasound scanning during surgery. It helps surgeons see, locate and remove the cancer cells more accurately. At least four hospitals here have adopted this technology as a guide during breast conserving cancer surgery.

A study by one of them, Changi General Hospital (CGH), showed that patients who had ultrasound scanning during surgery had to come back a second time to have more cancerous tissue removed.

This is a great improvement compared with data prior to 2004. In 2004, about 20 per cent of women who had to have a second operation. This was before ultrasound scanning was used during surgery. CGH data from microscopic examinations of the excised breasts after the surgery showed these women had left some cancer cells behind.

A study of 86 CGH patients operated on between December 2004 and last March found that 9 per cent of patients who had ultrasound scanning during surgery had to come back a second time to have more cancerous tissue removed.

It is not the only hospital using scans routinely during breast conserving surgery. Some hospitals use CT scans, while others use MRI scans during surgery.

A study of breast cancer patients at CGH is in the works, with about 1,700 women diagnosed here last year. An average of 1,624 women found they had breast cancer each year between 2007 and 2011. It is the most common cancer among women, accounting for 30 per cent of new cancer cases diagnosed.

An average of 383 women died of the cancer each year during the same period.

A mock-up of breast conserving surgery with the use of ultrasound at Changi General Hospital. A study of 86 Changi General Hospital patients operated on between December 2004 and last March found that 9 per cent of patients who had ultrasound scanning during surgery had to come back a second time to have more cancerous tissue removed, compared with 38 per cent prior to 2004, when ultrasound scans were not used during surgery.

For stage 1 breast cancer, the surgery is offered by some surgeons at Mount Elizabeth Hospital and the National Cancer Centre Singapore (NCCS). For stage 2 breast cancer, it is conducted at the National Centre for Cancer Surgery (NCCS), some women with early-stage breast cancer can have breast conserving surgery and have radiation therapy as an additional treatment.

Radiotherapy is required after breast conserving surgery to boost the risk of cancer occurring again in the same breast. But it is usually administered after the operation, over four to six weeks.

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For instance, ultrasound scanning is not used at the NCCS because ultrasound scans were not used during surgery.

The use of ultrasound scanning during breast conserving surgery at NCCS depends on the type of surgery being performed.

For the last 1½ years, Dr Ng Kong Wai, senior consultant at the department of surgical oncology at NCBS, has used it for all his patients during breast conserving surgery. "I give them another gauge, other than touch, and helps me to remove the breast with more accuracy or little or no excision," he said.

At NCCS, between 15 and 20 per cent of women have ultrasound scanning during breast conserving surgery. In some cases, the use of ultrasound during breast conserving surgery will add a few hundred dollars to the fees for the operation. The average bill size for lumpectomy in hospitals here ranges between $3,500 and $5,500, based on figures from the Ministry of Health’s website.

Some hospitals now use ultrasound technology to guide the surgeon in this respect.

Association Professor Tan Suh Ling, chief of surgery and director of the Breast Centre at CGH, said: "Before using ultrasound during surgery, we relied on feeling around the cancer lump to remove it."

**HOW THE SCANNING WORKS**

Using intra-operative ultrasound, surgeons can accurately locate the cancer lump and be more precise in removing the affected area of breast tissue.

A rim of breast tissue around the cancer lump is also removed at the same time to ensure that all the cancerous tissue is removed. This is to make sure the margin and it should be clear of cancer cells.

After the tissue is surgically removed, it is scanned again using ultrasound.

Additional breast tissue would be removed if the cancer-free margin is found to be less than 1.5mm in thickness.

This technique has been used on 113 breast cancer patients at CGH.

It is not the only hospital using scans routinely during breast conserving surgery. Some surgeons at KK Women’s and Children’s Hospital have also used the technique since last year. Dr Ng Hong Ha, head and senior consultant at the KK Women’s and Children’s Hospital, said Dr Hong Ga Sze, head and senior consultant at the KK Women’s and Children’s Hospital, said:

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