



# New ABUS Technology Delivers Improved Breast Care in Asia

## Growing Incidence of Breast Cancer in Asia

While the incidence of breast cancer has historically been lower in Asia than in Europe and North America, many Asian countries have seen significant increase over the past two decades. In some cases, the rate of increase has been six to eight times the worldwide average.<sup>1</sup>

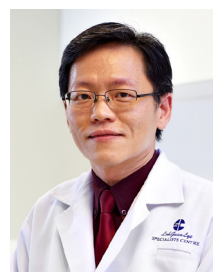
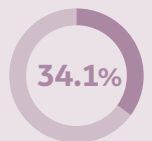
Today, breast cancer is a major healthcare issue across Asia and is now the most common form of the disease among women in the region. Additionally, while only 33% of women diagnosed with breast cancer worldwide are estimated to be under age 50 at the time of diagnosis, more than 42% of women diagnosed throughout the Asia-Pacific region are under 50.<sup>2</sup>

In general, a number of studies have observed that Asian women typically have denser breasts than Caucasian women. Dense breast tissue, which refers to how breast tissue appears on a mammogram, is one of the strongest common risk factors for developing breast cancer.<sup>3</sup> Additionally, breast density reduces the sensitivity of mammography and up to one third of breast cancers can be missed.<sup>4</sup>

The *Loh Guan Lye* SPECIALISTS CENTRE (LSC) in Penang, Malaysia decided to take measures to address this issue since 59% of Malaysian women have been found to have dense breasts.<sup>5</sup> The Centre sought out a more efficient and effective tool to overcome the limitations of mammography in women with high breast density and installed an Invenia™ ABUS (Automated Breast Ultrasound) from GE Healthcare in December 2017. “In order to improve the survival rate for Malaysian women with breast cancer, these cases need to be detected at an earlier stage and we believe that access to automated breast ultrasound (ABUS) is an important step in this process,” said Dr. Lai Fong Ming, Consultant Radiologist.

## BREAST CANCER IN MALAYSIA

According to the Malaysian National Cancer Registry Report, breast cancer is the most common cancer in women in Malaysia, accounting for 34.1% of all cancer.<sup>6</sup> The incidence rate in Malaysia is 38.7 per 100,000, which is below the global rate; however, the mortality rate is 18.9 per 100,000 – 47% higher than the global average.<sup>7</sup>

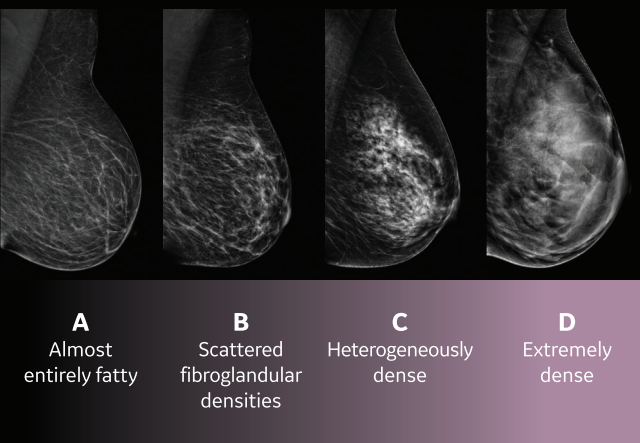


**Dr. Lai Fong Ming**  
Consultant Radiologist,  
*Loh Guan Lye* SPECIALISTS CENTRE (LSC)

## THE PROBLEM PRESENTED BY DENSE BREAST TISSUE

The term “dense breast” indicates the breast has a higher proportion of glandular breast tissue to fatty tissue. Dense breast tissue can make it more difficult to see breast cancer on a mammogram because the tissue can obscure a radiologist's view. Women with dense breast tissue have also been found to have a higher than average risk of breast cancer.

### Breast Density Classifications



## New ABUS Technology Delivers Proactive Care

Multiple studies have shown that the addition of supplemental screening with hand-held ultrasound, ABUS or tomosynthesis to mammography can improve cancer detection in women with dense breasts.

GE Healthcare offers the only FDA-approved ultrasound supplemental screening technology that is specifically designed for detecting cancer in dense breast tissue. This technology has demonstrated a 55% relative increase\* in invasive cancer detection for these women.<sup>8</sup>

Supplemental imaging with ABUS transforms breast care from reactive to proactive. Clinical research studies demonstrate that when used as an adjunct to mammography, small cancers visible only through ABUS were predominantly invasive and node-negative.<sup>9,10</sup> Detecting them at this earlier stage has important prognostic implications and can reduce the cost of care.<sup>11</sup>



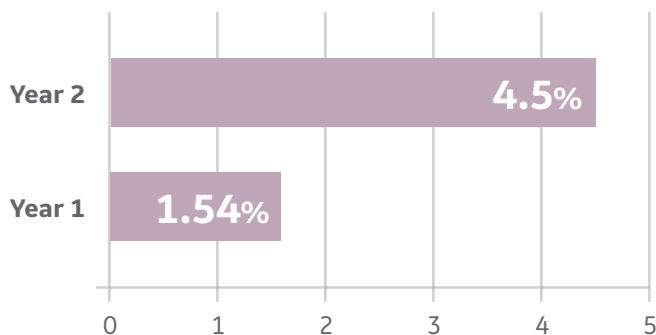
## Loh Guan Lye SPECIALISTS CENTRE (LSC)



*Loh Guan Lye* SPECIALISTS CENTRE (LSC), established in 1975, is a 273 bed private hospital located in Georgetown, Penang. LSC installed an Invenia ABUS system in December 2017. The goal of the implementation was to migrate from handheld ultrasound (HHUS) and offer ABUS exams the same day following a mammogram.

The percentage of breast cancer detection after the introduction of the ABUS system was 1.54% in the first year and 4.54% in the second year. The increase in the detection rate in the second year is at least partially due to the increase in usage of the ABUS system as a supplement to mammography for screening patients with dense breast parenchyma (Figure 1).

**Cancer detection improvement with ABUS**



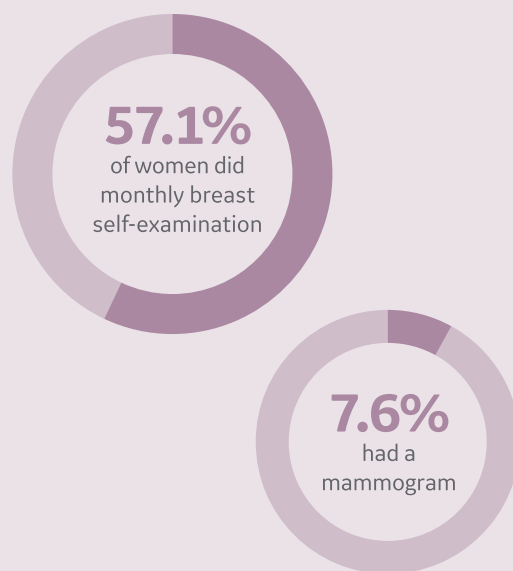
**Figure 1.**

“Not only did we improve clinical results, the addition of ABUS resulted in better workflow and shorter patient wait times,” said Dr. Lai. “Previously, HHUS exams were performed by our ultrasonographer and often took up to 20 minutes. After training, our staff can complete an ABUS exam in 15 minutes, capturing three 3D volume sets for each breast. Additionally, ABUS allows for greater consistency and reproducibility of images and can not only be operated by our three ultrasonographers but also our seven radiographers.”

LSC conducted extensive training to prepare radiologists to read ABUS exams. In most cases, radiologists were able to master reading after 30 cases, with the confidence level increasing from 20 minutes per case to an average of 5 minutes. With ABUS, the radiologist reports on standardised views of the entire breast, as compared to representative images obtained by the ultrasonographer performing the handheld ultrasound. It gives reliable and reproducible high-resolution 3D imaging of the entirety of the breast. In addition, the reconstructed coronal plane of the ABUS allows for higher detection of architectural distortion compared to handheld ultrasound.

## NEED FOR EDUCATION ABOUT BREAST HEALTH

Currently mammography screening in Malaysia is done opportunistically as opposed to population-based. The Malaysian Clinical Practice Guideline on the Management of Breast Cancer recommends screening mammography be performed biennially in women from 50-74 years of age. However, only 57.1% of women did monthly breast self-examination and only 7.6% had a mammogram.<sup>12</sup> The reasons found for the low uptake of mammography screening in Malaysia include lack of knowledge, embarrassment, and fear of cancer diagnosis.<sup>13</sup>

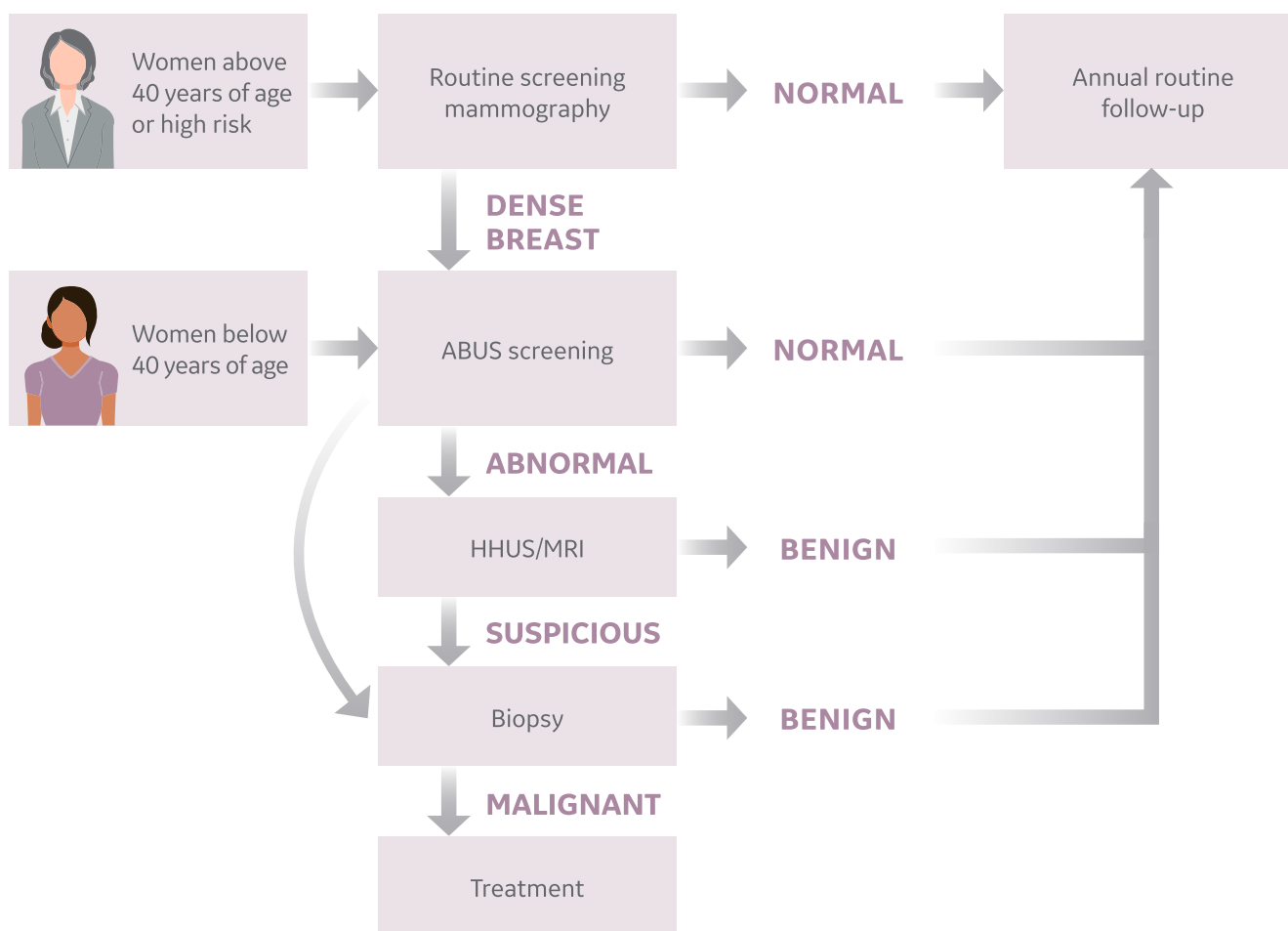


According to Dr. Lai, “In order for our ABUS program to work, we not only had to educate patients but also the local breast surgeons and obstetricians and gynaecologists about our new capabilities. Education efforts focused on informing referring physicians about the role of supplementary ultrasound and the advantages of using ABUS. As a result of our education efforts, we have seen a steady increase of referral orders and patient requests for ABUS exams and our volume has increased by 10.5% yearly.”

LSC has successfully implemented an ABUS program, improving cancer detection and breast ultrasound workflow.

*“Looking to the future, we’d like ABUS to be more widely available across Malaysia. A mobile breast screening unit with mammography and ABUS systems could increase the detection rate of breast cancer especially in the younger women with dense breasts. To save cost, both the mammogram and the ABUS scan can be operated by a single radiographer. Hopefully this will allow more breast cancer to be detected in the early stages and reduce the mortality rate from breast cancer in Malaysia,” concluded Dr. Lai.*

## Patient Workflow



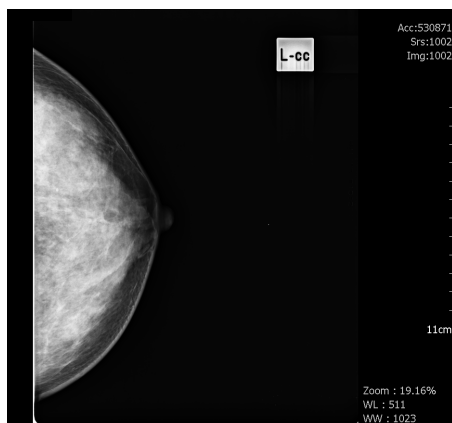
**Figure 2:** Schematic diagram of new workflow for breast screening.

# Case Presentation

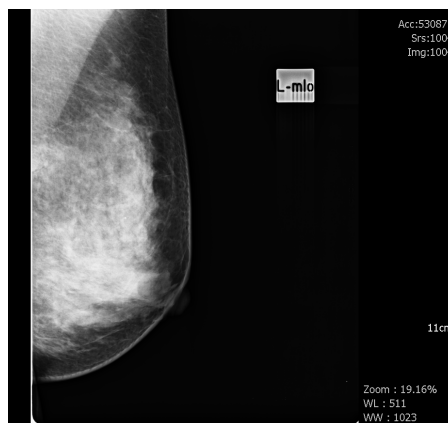
A 44 year old woman with a strong family history of breast cancer felt a palpable lump in her left breast and came in for an examination. Results of a handheld ultrasound (HHUS) exam showed an ill-defined lesion in her left breast.

## Investigation and diagnosis

The breast surgeon ordered a diagnostic mammogram to further interrogate the lesion. No abnormality was seen, and the mammogram showed no change from her previous mammogram from 2015. However, since her current assessment showed heterogeneously dense breast tissue (category C), an ABUS exam was ordered.

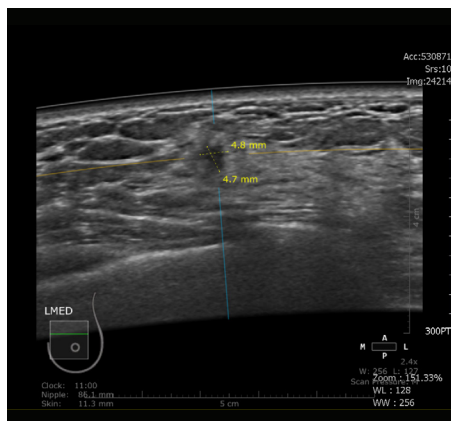


Mammography CC view of the left breast.

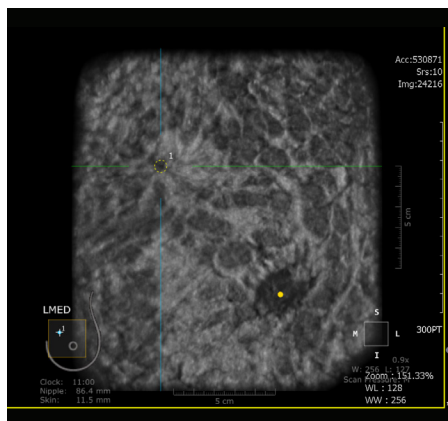


Mammography MLO view of the left breast.

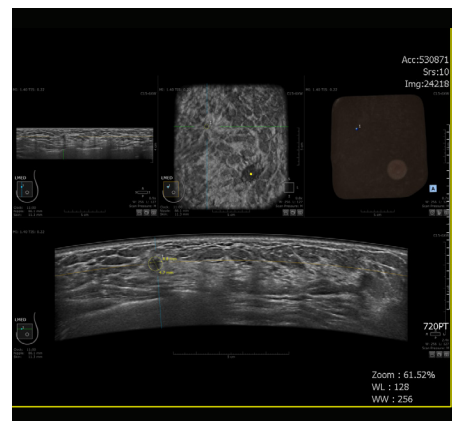
The 4.8 mm lesion confirmed by ABUS appeared hypoechoic, and spiculated with an echogenic halo around the solid lesion. A CT scan was performed for staging and showed no evidence of metastasis.



Left medial view of the palpable mass.



Coronal view of the mass.



The ROI view of the suspicious mass.

## Final diagnosis and treatment

Histopathology confirmed the lump in the upper inner quadrant was a Grade 2 infiltrating ductal carcinoma and DCIS with nuclear Grade 2. The invasive 1 cm DCIS carcinoma was located 1 cm from the deep surgical margin. The surgical margins and skin were free of malignancy and the left axillary sentinel lymph nodes were free of tumour.

After the ultrasound guided local excision and removal of left sentinel nodes was performed, the patient was successfully treated with chemotherapy and radiation.

## Conclusion

According to Dr. Lai, "As the incidence of breast cancer continues to rise throughout Asia, particularly among younger women with high breast density, it is critical that we detect these cancers earlier. With the ability to detect small lesions in patients with dense breasts, ABUS shows great promise to enhance early breast cancer detection and reduce mortality in Malaysia and throughout the region."

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\*Increase in sensitivity was associated with a decrease in overall specificity.



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