CASE REPORT

Natural history of luminal A breast invasive ductal carcinoma in an elderly

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SUMMARY

An elderly woman, with no clinically palpable breast lump, presented with an initially benign-appearing lesion on ultrasound. She was followed up to reveal the natural history of luminal A breast cancer.

BACKGROUND

There are sparse data on the natural progression of luminal A breast invasive ductal cancer in literature. This is the first known case, to our knowledge, in an elderly woman, with no clinically palpable breast lump, who presented initially with an apparently benign-looking lesion on ultrasound. This lesion was followed up to depict the natural history of luminal A breast cancer, giving insight into its behaviour.

CASE PRESENTATION

A 76-year-old woman, with no known medical history, presented with a vague left axillary lump of 3 weeks' duration. Examination of her breasts and axilla did not reveal any masses.

INVESTIGATIONS

Her mammogram revealed extremely dense tissues but was otherwise unremarkable. Ultrasound of her breasts however revealed a right nine o'clock benign-looking lesion measuring 0.8×0.6×0.3 cm (figure 1). Ultrasound of her bilateral axilla and left breast was normal.

DIFFERENTIAL DIAGNOSIS

As the lesion was subcentimetre and benign looking on ultrasound, the possible diagnosis could include a benign mass such as a fibroadenoma. This was feasible, especially if this was proven to be a long-standing lesion. However, we could not ascertain how long the lump had been present since the patient was asymptomatic, and there was no previous ultrasound for comparison. As such, malignancy needed to be excluded in view of the patient's age.

TREATMENT

The patient was then followed up with a right breast ultrasound 6 months later which revealed a more lobulated and marginally larger 9 o'clock lesion measuring 1×1×0.6 cm (figure 2). The lump was now clinically palpable. As a result of the increase in size of the lesion, the patient was offered a biopsy. The patient however opted for a short-term 3-month follow-up.

An ultrasound about 9½ months after the initial ultrasound showed growth of the same lesion to 1.7×1.5×1.0 cm with an irregular outline (figure 3). Biopsy of the lesion confirmed invasive ductal carcinoma. Staging scans revealed no distant metastasis.

The patient underwent a right breast wide local excision with sentinel lymph node biopsy about a year after her initial imaging. Histology revealed a 30 mm invasive ductal carcinoma, grade II, associated with intermediate grade ductal carcinoma in situ (DCIS). The total size of the tumour including the DCIS measured 40 mm. Oestrogen receptor (ER) was positive while the progesterone receptor and human epidermal receptor 2 (HER2) were negative, respectively. Antigen Ki67 was 20%, characterising the lesion as luminal A subtype. Lympho-vascular invasion (LVI) was present. Sentinel lymph node biopsy was negative.

The superior margin however showed DCIS <0.1 mm from the margin. The patient hence underwent re-excision of the superior margin which revealed no further carcinoma.

OUTCOME AND FOLLOW-UP

The patient recovered well from her surgery and underwent radiotherapy. She will be receiving hormonal therapy as per multidisciplinary meeting recommendations. She is currently about 4 months post her initial surgery.

DISCUSSION

Increasing age is a known risk factor for developing breast cancer, with over 40% of newly diagnosed breast cancers occurring in the elderly,¹ universally defined as a chronological age of 65 years and above. The incidence of breast lump development in the elderly is unknown and not all breast lumps are malignant. However, a higher frequency of breast cancer has been associated in older women with breast symptoms compared with the young, with a study reporting a breast cancer diagnosis in 21% of women aged over 55 years old versus an exceedingly low rate of <1% in women ≤40 years old.²

As a result, in an elderly woman with a breast complaint, the possibility of malignancy needs to be excluded. In our patient, there was no clinically palpable lesion at presentation and her breast cancer was only detected on imaging which has been known to be more sensitive than clinical palpation in the detection of breast lesions, especially when they were small in size.³

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Figure 1 Initial ultrasound showing a benign-looking 0.8 cm right (RT) breast lesion. CMFN, centimetres from nipple.

Though mammogram was the recommended screening modality, it can miss some cancers, especially if there was dense breast tissue,⁴ as seen in our patient. As a result, in asymptomatic women with dense breasts, a supplementary ultrasound has been reported to increase the breast cancer detection yield by 2.391 cancers per 1000 women compared with mammogram alone.⁴ Supplementary ultrasound was particularly useful when the cancer was small and node negative. This was witnessed in our patient, whose cancer was only picked up by ultrasound. In addition, about 2.3% of breast cancers can present initially with seemingly benign features on ultrasound⁵; hence, it is important to correlate clinically the radiological findings.

MRI is another useful imaging modality, which has been reported to be able to detect cancers at an earlier stage and could distinguish luminal A from B subtype.⁶ However, this result remained preliminary and a biopsy is still needed for diagnosis.

The elderly, compared to the young, tended to have breast cancer of an indolent nature, with less aggressive tumour biological features.¹ Together with other factors, such as a higher likelihood of having competing comorbidities, the optimal management of elderly with breast cancer remained controversial, with some studies reporting undertreatment of the elderly.¹ As a result, treatment of the elderly should be discussed in a multidisciplinary meeting with geriatric assessment, when deemed necessary. Our patient underwent surgery and re-excision, in

Figure 2 Right (RT) breast ultrasound 6 months later showing a marginally larger lesion measuring 1 cm. CMFN, centimetres from nipple.

Figure 3 Right breast ultrasound 9½ months after initial imaging showing progression of the same lesion to 1.7 cm with an irregular outline. CMFN, centimetres from nipple.

accordance with the recommended Society of Surgical Oncology - American Society for Radiation Oncology- American Society of Clinical Oncology (SSO-ASTRO-ASCO) guidelines of achieving 2mm resection margins for DCIS.⁷ Chemotherapy was not recommended in view of the patient's luminal A subtype and age, whereby a study showed no survival benefit of chemotherapy in patients older than 70 years.⁸ Our patient, however, had radiotherapy and hormonal therapy, as per the multidisciplinary meeting recommendations.

Based on current evidence, the patient will be a good candidate for aromatase inhibitor monotherapy⁹ or a tamoxifen and sequential switch to aromatase inhibitor treatment regimen¹⁰ as aromatase inhibitors have been shown to reduce recurrence rates compared with tamoxifen alone. However, as aromatase inhibitors also increased fracture rates,¹¹ the risks and benefits of each regimen will be discussed with the patient before a decision is reached. Nonetheless, extended hormonal therapy beyond 5 years is not recommended in this patient.^{12 13}

Finally, this case also illustrated the natural history of luminal A breast cancer which was not well documented in the literature. Luminal A breast cancer is the the most common molecular subtype and was typically defined as ER positive and HER2 negative, of grade I or II and low Ki67 based on St Gallen subtypes. Various cut-offs for Ki67 had been proposed and in our study, the cut-off of ki67 <30% was used to define luminal A cancer.¹⁴ Though genetic profiling, such as Prosigna Breast Cancer Prognostic Gene Signature Assay (formerly called the PAM50 test), also classified breast cancer into intrinsic subtypes and better predict the biological behaviour than using immunohistochemistry,¹⁵ this test was not adopted at our centre because of cost issue. Luminal A had a better prognosis compared with the rest of the molecular subtypes. Luminal A can have LVI, as evidenced in our patient, though LVI was more commonly seen in the other molecular subtypes.

Despite being luminal A subtype and occurring in an elderly, the cancer can progress to a T2 lesion (>2 cm to 5 cm) in a span of a year, as seen in our case. This natural progression may have implications on the choice of surgery and resultant treatment; hence, early detection is advocated in all cases of breast cancer. This information will provide valuable insight into the natural growth rate of luminal A breast cancer in the elderly, since such data are currently lacking in the literature. More studies will be needed in future to determine if this growth rate can be extrapolated to the rest of luminal A breast cancers.

In conclusion, in an elderly woman presenting with a breast lesion on imaging, this lesion needs to be evaluated, regardless of how seemingly benign-looking it may appear, to exclude the possibility of malignancy. Luminal A breast cancer can progress to a T2 lesion in a span of a year.

Learning points

- Breast cancer can initially manifest as a benign-looking lesion on imaging.
- A new breast lesion in an elderly woman should always be investigated or followed up to exclude malignancy, no matter how benign looking the initial imaging features may be.
- Luminal A breast cancer in an elderly can progress to a T2 cancer in a year's period.

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