

Case Report

Do not let the guard down: A case report on imaging evaluation of unilateral axillary lymphadenopathy following COVID-19 vaccination

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ABSTRACT

There is significant increase in number of COVID-19 vaccination recipients around the world to contain the COVID-19 pandemic. However, one of the most common adverse effects of COVID-19 vaccine is unilateral axillary lymphadenopathy. There is variable time for complete resolution of reactive lymphadenopathy. It has, therefore, lead to diagnostic dilemma for oncological imaging for breast cancer in recent times. We describe a case of unilateral axillary lymphadenopathy in a patient following COVID-19 vaccination, which was finally proven to be invasive carcinoma on histopathology.

Keywords: CA breast, Mammography, COVID-19, Vaccination, Lymphadenopathy

INTRODUCTION

There is considerable rise in number of COVID-19 vaccination recipients worldwide to contain the COVID-19 pandemic. One of the most common local adverse reactions to COVID-19 vaccination is vaccination-associated reactive lymphadenopathy. According to different studies conducted during COVID-19 pandemic, axillary lymphadenopathy has been reported to be ranging from 16% to 44% depending on the constituent of different vaccines.^[1,2] However, there is still no substantial information on the temporal changes of these reactive nodes as well as time required for complete resolution of lymphadenopathy post-COVID-19 vaccination.^[3] This has led to considerable diagnostic dilemma in oncological evaluation of the cases of unilateral axillary lymphadenopathy especially in women.

CASE REPORT

A 55-year-old lady presented with complaints of the left axillary swelling and pain since 2 months. Clinical history revealed that she has received second dose of COVID-19 vaccine on her left arm (Covishield by AstraZeneca) around 2 months back. Following vaccination, she noticed a tender swelling in ipsilateral axilla. She first reported to a general physician who suggested a likely diagnosis of COVID-19 vaccination-induced reactive axillary lymphadenopathy. However, due to apprehension, she reported to our center for further evaluation. There was no family history of breast cancer in any of her first-degree relative. However, considering the age of the patient, mammography was advised to rule out any underlying occult breast malignancy.

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Screening mammography was performed on CR-based mammogram system (Allengers MAM Venus) at our institute. Breast composition showed scattered areas of fibroglandular density (Type B). There was an ill-defined and irregular area of soft-tissue density radio-opacity with indistinct margins in the upper-inner quadrant of the left breast. Fine pleomorphic calcifications were seen within. Areas of fine linear branching calcification were also seen deep to this lesion (outside the mass in central quadrant). No associated architectural distortion/breast asymmetry was seen. Another well-circumscribed oval-shaped radio-opaque lesion measuring approximately ~10 mm in long axis was seen in the upper outer quadrant of left breast. Surprisingly, no axillary lymph node was seen on the left MLO view [Figures 1a, b and 2]. The right breast mammogram findings were unremarkable.

Ultrasound breast was done subsequently to correlate the mammography findings and also to look for the axillary swelling which was not seen on the mammogram. Ultrasound of the left breast showed an irregular and ill-defined heterogeneously hypoechoic lesion with indistinct margins, measuring approximately 8 × 14 mm in size, at 10 o'clock position in the left breast. Few foci of calcifications are shown within [Figure 3]. A well-defined hypoechoic oval- to round-shaped intra-mammary lymph node with increased cortical thickness (>3 mm) and thin echogenic hilum within was also seen at 1 o'clock position consistent with mammogram findings [Figure 4]. Ultrasound of the left axillary swelling revealed a 14 × 24 mm sized axillary lymph node with thin echogenic hilum [Figure 5]. Based on

the mammography and corroborative ultrasound findings, a score of Breast Imaging Reporting and Data System (BI-RADS) 4C (highly suspicious for malignancy) was given for the left breast.

Based on the BI-RADS score, the patient was advised ultrasound guided trucut biopsy of the suspicious axillary lymph node as well as breast lesion. Biopsy from axillary

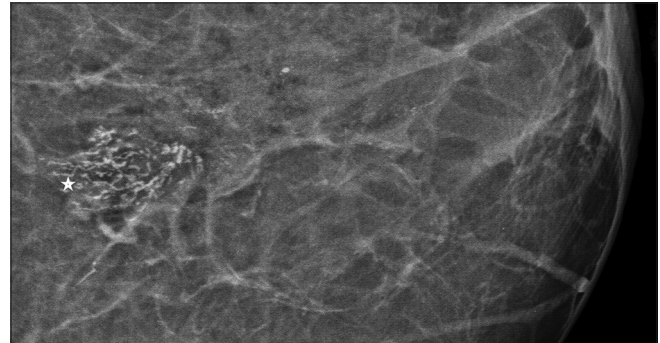


Figure 2: Depiction of fine linear branching pattern of calcification (Star) on zoomed up mammographic image (CC view) of the left breast-suggestive of suspicious morphology given as BI-RADS 4C lesion. BI-RADS: Breast imaging reporting and data system.

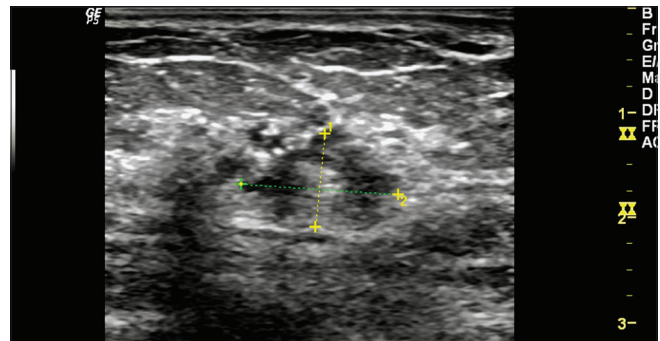


Figure 3: Ultrasound of the left breast showing an ill-defined heterogeneously hypoechoic lesion at 10 o'clock position in the left breast suggestive of suspicious morphology.

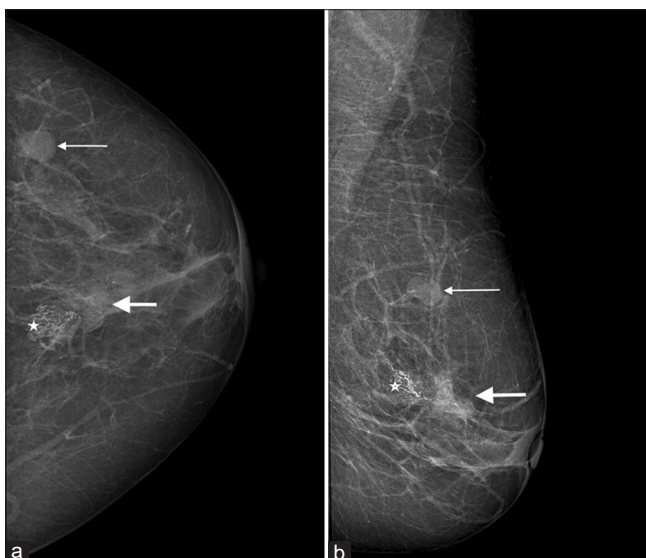


Figure 1: Mammography images with CC (a) and MLO (b) views of the left breast show an ill-defined lesion in upper inner quadrant of left breast (Thick arrow). Also note the fine linear branching calcification adjacent to this lesion (Star). An intra-mammary lymph node is also seen in the upper outer quadrant (thin arrow).

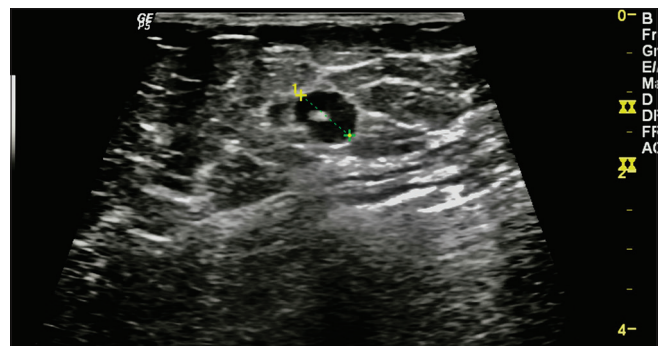


Figure 4: Suspicious looking intra-mammary lymph node with increased cortical thickness in the left breast.

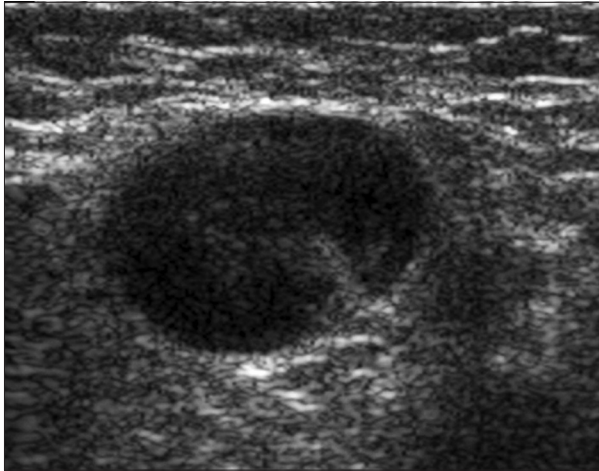


Figure 5: Suspicious looking left axillary lymph node with increased cortical thickness and partial loss of central echogenic hilum.

node showed metastases from breast primary. Furthermore, biopsy from breast lesion revealed invasive ductal carcinoma of the left breast. The patient underwent mastectomy and currently undergoing 6 monthly follow-up.

DISCUSSION

Unilateral axillary lymphadenopathy can have wide range of etiologies comprising both benign and malignant etiologies. The most common cause is inflammation, infection, or trauma; however, a significant proportion of cases are due to occult malignancy, particularly in women, where breast cancer needs to be excluded with screening modalities such as mammogram and ultrasound.

Vaccination-induced unilateral reactive lymphadenopathy is one of the most common adverse effects of COVID-19 vaccination. With increasing COVID-19 vaccine availability and wider recipient population, there is anticipation that increased number of patients will demonstrate unilateral axillary lymphadenopathy on imaging. Many reports in recent literature have reported COVID-19 vaccine-associated lymphadenopathy on various imaging modalities such as mammography (up to 3%) and PET/CT (1–45%).^[4,5] The time period for complete resolution of COVID-19 vaccine-induced reactive lymphadenopathy has not been well documented yet. There is no clear consensus on follow-up imaging in healthy women for vaccine-induced lymphadenopathy; however, cautious interpretation is needed in those with recently diagnosed breast cancer cases or with high-risk features. Reactive lymphadenopathy cannot be easily differentiated from metastatic disease by their morphology or location.^[6] European society of breast imaging recommends follow-up at least 12 weeks after second vaccine dose.^[7] A recent study

has shown that reactive lymphadenopathy persisted as long as 43 weeks.^[2]

Breast cancer is the most common type of malignancy in women, and one of the three most common cancers worldwide, along with lung and colon cancer.^[8,9] Breast cancer is second most leading cause of mortality after cardiovascular diseases.^[10] Hence, it becomes imperative for clinicians for the early diagnosis and further management. Mammography is the most widely used screening technique for the early detection of breast cancer, and it plays a significant role in the early detection of breast cancer. The BI-RADS lexicon is currently the most commonly used standardized reporting tool for the radiologists world over.^[11] Invasive ductal carcinoma is the most common type of breast cancer as was our case.^[12] On mammogram, it appears as an irregular mass with or without calcification. Margins can be spiculated or indistinct. Microcalcifications if present can either be pleomorphic, fine linear branching type.^[12] On ultrasound, these lesions appear as an ill-defined, hypoechoic lesion. Margins may be angular or can show branching or speculated pattern. These are few important imaging features that have to be kept in mind while reporting, so as to correctly diagnose the breast malignancy.

CONCLUSION

Our case report emphasizes the fact that there should be no delay in screening mammograms due to recent vaccinations as we have seen from various studies that there is variable delay in resolution of reactive lymphadenopathy in different individuals. Unilateral lymphadenopathy in COVID-19-vaccinated individuals should be interpreted in the context of patient risk factors. There should be proper imaging and histopathological evaluation in patients with concurrent suspicious imaging findings in ipsilateral breast on screening mammogram or ultrasound. Do not let the guard down!

Teaching points

1. Vaccination-induced unilateral reactive lymphadenopathy is one of the most common adverse effect of COVID-19 vaccination.
2. Unilateral lymphadenopathy in COVID-19-vaccinated individuals should be interpreted in the context of patient risk factors.
3. Unilateral axillary lymphadenopathy can have wide range of etiologies comprising of both benign and malignant etiologies. The most common cause is inflammation, infection or trauma; however, a significant proportion of cases are due to occult malignancy, particularly in women where breast cancer needs to be excluded with screening modalities such as mammogram and ultrasound.

MCQs

1. In a case of COVID-induced unilateral axillary lymphadenopathy in women, European society of breast imaging recommends follow-up at
 - a. Between 4 and 6 weeks after second dose.
 - b. Breast imaging is not required.
 - c. At least 12 weeks after second vaccine dose.
 - d. 8–12 weeks after second dose.

Answer Key: c

2. A recent study has shown that reactive lymphadenopathy following COVID-19 can persist as long as
 - a. 8 weeks.
 - b. 12 weeks.
 - c. 30 weeks.
 - d. 43 weeks.

Answer Key: d

3. Which of the following are suspicious findings for breast malignancy on mammogram?
 - a. Well-circumscribed margins.
 - b. Macrocalcifications.
 - c. Ill-defined margins with spiculated margins.
 - d. Pleomorphic microcalcifications.

Answers Key: c, d

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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