

A Rare Case of Fibroadenoma Presenting in the Accessory Breast as Axillary Lymph Node: A Clinical Dilemma

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Abstract

Patients with axillary lumps undergo thorough examinations and investigations to rule out malignancy, particularly in women, where many are associated with breast cancer metastasizing to lymph nodes. Supernumerary breast tissue harbouring a lump poses a rare but heightened risk of cancer, while in regions like India, tuberculosis should also be considered. Benign conditions like fibroadenomas in ectopic breast tissue are even rarer. Hence, any axillary lump case warrants consideration of these possibilities. We present a rare case of a young female with a solitary lump in ectopic breast tissue, initially resembling an axillary lymph node on imaging but later diagnosed via fine needle aspiration cytology (FNAC) as a fibroadenoma.

1. Introduction

A well-documented anomaly of the breast is Ectopic breast tissue (EBT), also known as supernumerary breast, polymastia or accessory breast, which develops along the milk line that extends from the axilla to the groin [1]. These lines delineate the location of embryonic mammary ridges. In typical development, most embryologic mammary ridges along the milk line undergo involution, except for two segments in the pectoral region, eventually forming the breasts [2]. Failure of involution in any of these ridges leads to the development of accessory breasts. The prevalence of accessory breast tissue varies based on factors such as gender, geographical area, race, and inheritance, with estimates ranging from 0.22% to 6% in the general population [3].

While fibroadenomas are benign lesions commonly found in normal breast tissue, their occurrence in accessory breast tissue is exceedingly rare, with only a few documented cases in the literature. Notably, these cases carry clinical significance due to their association with congenital anomalies in the urinary and cardiovascular systems [4]. Additionally, when these swellings

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manifest in the axilla or groin, they may present a diagnostic challenge, resembling other tumorous lesions like lymphoma or causes of lymphadenopathy. Therefore, depending on their anatomical location, fibroadenomas in accessory breast tissue can pose a diagnostic dilemma for clinicians [5].

This rare case of a young female with a fibroadenoma of the axillary accessory breast tissue mimicking an axillary lymph node is reported to underscore the crucial importance of including accessory breast tissue, along with its associated pathology, in the differential diagnosis when evaluating an axillary mass.

2. Case Report

A 23-year-old unmarried female presented in surgical OPD with a complaint of a right axillary swelling persisting for the past 6 months (FIG. 1 & 2). The swelling started as a small lump and gradually increased in size 3 cm × 3 cm over time. Besides experiencing mild local pain and discomfort, the patient reported no additional symptoms such as cough, fever, weight loss, night sweats, or other constitutional issues. No history of bone pain, cough or hemoptysis, headache or seizures was present. The patient had no relevant past or family history. The lymphoglandular system (LGS) examination identified a solitary mass measuring approximately 3 cm × 3 cm in the left axilla. The mass was firm, non-tender, well-defined, mobile, and distinctly separate from the left breast. The overlying skin was normal, without a nipple, areola, or ulceration. No clinically significant findings were observed upon examination of the left axilla or other accessible lymph node regions. Breast examination revealed the presence of accessory breast tissue in the bilateral axilla without any accessory nipple or areola. The nipple-areola complex was normal.



FIG. 1, 2. Swellings in axilla.

Laboratory investigations done simultaneously with imaging of choice- ultrasound, including complete blood count (CBC), erythrocyte sedimentation rate (ESR), and chest X-ray, were noncontributory. These laboratory test results were within our laboratory's normal reference range.

The Ultrasound reported that "an oval lymph node of size measuring 33 mm × 29 mm is seen in the right axillary region (FIG. 3). Normal glandular and fatty tissue are seen in both breasts. There is no evidence of any focal mass lesion or microcalcification. Bilateral nipple normal."

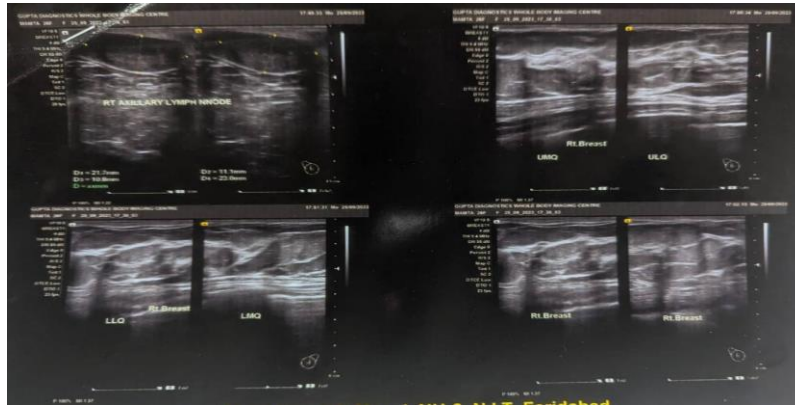


FIG. 3. Ultrasound of axilla.

FNAC revealed "Fibroadenoma IAC Yokohama category-II; benign 2016". Therefore, to confirm the diagnosis, the patient was planned to undergo bilateral accessory breast excision with excision of the right axillary breast lump for biopsy.

Intraoperatively, a firm, mobile, well-capsulated solitary grey-white 4 cm × 3 cm mass in the right axillary fossa was delivered (FIG. 4).

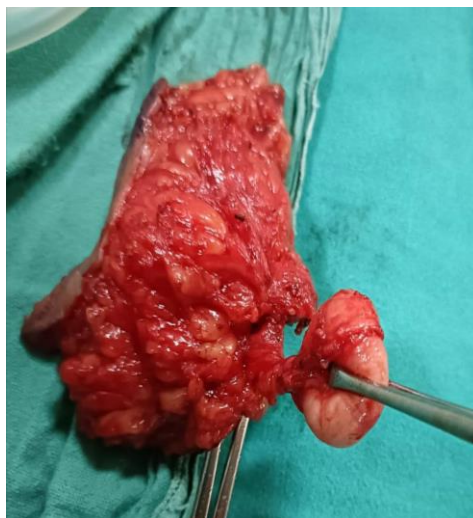


FIG. 4. Operative photo.

The postoperative period was uneventful, with a smooth recovery. The patient followed up in the surgery OPD after one week with the report of histopathology of the excised sample, which confirmed the diagnosis of fibroadenoma.

3. Discussion and Review

This report details the case of a 23-year-old female with a chief complaint of right axillary swelling persisting for 6 months. Initially, the clinical impression leaned towards axillary lymphadenopathy, with concerns about an occult neoplasm developing in the breast prompting an investigation to rule out malignancy and tuberculosis. Ultrasound suggestive of axillary lymphadenopathy strengthened the suspicion. However, further examination, specifically fine-needle aspiration cytology (FNAC), suggested the presence of a fibroadenoma in the axillary accessory breast tissue. This diagnosis was subsequently confirmed through histopathological examination following an excisional biopsy. The case highlights the importance of a thorough diagnostic approach and consideration of accessory breast-related conditions when evaluating axillary masses.

Accessory breast tissue, or ectopic or supernumerary breast tissue, may develop due to one of two main theories [6,7]. The more acknowledged theory suggests that accessory breasts result from incomplete regression of the mammary milk lines during embryonic development. Typically, these milk lines form as twin ectodermal ridges along the sides of an embryo between the armpit and the groin around the sixth week of gestation. As embryogenesis proceeds, all but the pectoral portions of these ridges ordinarily dissipate, leaving behind the precursors to the normal breast. In cases where these extra ridges do not regress as they should, accessory breast tissue might manifest anywhere along this primitive tract.

Corroborating this concept is that accessory breasts are predominantly found along the traditional path of the milk line. However, there have been instances of them appearing in unconventional areas, such as the face, neck, thighs, and even the limbs^{8,9}. These uncommon occurrences lend some credence to the alternative hypothesis, which links the formation of accessory breasts to changes in the apocrine glands associated with sweating.

Regardless of whether the additional breast tissue comes with a nipple and areola, it can vary in size from evident and tangible to diminutive and impalpable. In the case being discussed, detecting a fibroadenoma in the axillary area suggests the presence of accessory breast tissue, aligning with the first hypothesis since the axilla is a common site along the milk line for this phenomenon to occur.

The accessory breast classification system introduced by Kajava in 1915 remains in use today. Considering that the presented case involves glandular tissue (identified as fibroadenoma) without a nipple-areola complex, it falls within class IV according to Kajava's classification system [10,11].

- **Class I:** This type comprises a fully developed additional breast that includes the presence of glandular tissue, a nipple, and an areola, which mirrors the anatomy of a complete breast.
- **Class II:** In this class, the accessory breast has glandular tissue and a nipple but lacks an areola.
- **Class III:** This type features glandular tissue and an areola but does not have a nipple.
- **Class IV:** Represents an accessory breast made solely of glandular tissue without a nipple or areola.
- **Class V:** This class encompasses instances where a nipple and areola are present without any glandular tissue. This form is also known as pseudomamma.

- **Class VI:** The accessory formation is only of a supernumerary nipple, a condition referred to as polythelia.
- **Class VII:** This class includes only an areola and polythelia areolaris.
- **Class VIII:** The presence of redundant nipple hair, without any other breast components, is classified as polythelia pilosa. These classifications help clinical assessment and management of accessory breast tissue by clearly identifying the specific tissue type or features present.

Accessory breast tissue, which has an incidence ranging from 0.4% to 0.6% in women and about half of the same in men, can manifest sporadically without a clear family history; however, there have been reports of it occurring within families and being linked with urogenital and congenital heart defects. Despite this, the association has been debated within the medical community [12-14]. It has been noted that people with extra nipples, a condition known as polythelia, may have a higher incidence of urinary tract differences. These can vary broadly, including abnormalities like the presence of additional kidneys, underdeveloped kidneys, kidney cancer, swelling caused by excess fluid in the kidneys (hydronephrosis), kidney disorders characterized by cysts (polycystic kidney disease), duplicated kidney arteries, and narrowed ureters [15].

This connection between supernumerary breast tissue and urogenital abnormalities may be because mammary glands and the genitourinary system develop nearby and at a similar time during embryogenesis. Moreover, accessory breast tissue has been linked with other congenital conditions like pyloric stenosis, a thickening of the stomach valve that can block food from entering the small intestine, epilepsy, and congenital heart disorders. Such associations may provide valuable insights for clinicians when assessing patients with polythelia or accessory breast tissue, prompting a more thorough investigation for associated abnormalities.

Accessory breast tissue is susceptible to hormonal responses and can undergo benign and malignant pathological processes, mirroring those observed in regularly situated breast tissues. This includes fibrocystic disease, intraductal papilloma, lactating adenoma, fibroadenoma, and carcinoma. Among these, carcinoma is reported as a common pathology [16]. The recognition of such potential pathologies emphasizes the need for thorough monitoring and evaluation of accessory breast tissue, particularly considering its capacity to manifest malignancies similar to those found in the primary breast location.

Fibroadenomas are benign breast tumours marked by the simultaneous proliferation of glandular (epithelial) and connective (stromal) tissue elements. Typically, nonpainful, these tumours are firm and can easily move under the skin when touched. They have a slow growth rate and distinct edges, often making them easier to identify during a clinical examination.

Fibroadenomas are particularly common among young women. Within the adolescent demographic, fibroadenomas occur with an incidence rate of about 2.2%. Among all breast masses identified in this age group, fibroadenomas represent approximately 68%. Additionally, when breast lesions in adolescents are biopsied, fibroadenomas make up a significant proportion, ranging from 44% to 94% [17,18]. These statistics highlight the prevalence of fibroadenomas in younger patients, and while they are benign, appropriate evaluation and management are important to distinguish them from other breast masses that may require different clinical approaches.

While fibroadenoma is a prevalent benign lesion in normal breast tissue, its occurrence in accessory breast tissue is exceptionally rare, and only a limited number of cases have been reported in the literature. Consistent with the presented case, the most common anatomic location for these occurrences is in the axilla, although fibroadenomas have been documented in various places along the milk line. Notably, reported cases include locations such as the perineum, face, and back [19]. These cases pose diagnostic and management challenges due to the condition's rarity and difficulties distinguishing fibroadenomas from other malignant tumours.

When it comes to tumours in accessory breast tissue, the protocols for diagnosis and treatment typically mirror those applied to masses in the normal breast. Due to the uncommon nature of accessory breast tissue and consequent low clinical suspicion, there can be a delay in the diagnosis, which might complicate or postpone the initiation of treatment. For masses found along the typical mammary line, it is crucial to consider the existence of breast tissue in the differential diagnosis.

To provide a preliminary assessment, Ultrasound is a valuable imaging modality commonly used to diagnose fibroadenomas in the breast [20]. It offers a non-invasive and detailed examination of breast tissue, providing information about the detected mass's size, shape, and characteristics. Here's how ultrasound aids in diagnosing fibroadenomas:

1. **Identification of Mass:** Ultrasound can effectively detect the presence of a mass or lump in the breast tissue. Fibroadenomas typically appear as well-defined, solid, and round or oval-shaped masses.
2. **Differentiation from Cysts:** Ultrasound helps differentiate between solid masses like fibroadenomas and fluid-filled cysts. Fibroadenomas present as solid masses, whereas cysts appear as fluid-filled structures.
3. **Characterization of Tissue:** Ultrasound helps characterize the internal structure of the mass. Fibroadenomas often exhibit a homogeneous echo pattern, although they may have some variations.
4. **Vascularity Assessment:** Doppler ultrasound can assess blood flow within the mass. Fibroadenomas typically have minimal vascularity, helping to distinguish them from more concerning lesions.
5. **Guidance for Biopsy:** If necessary, Ultrasound can help to locate mass precisely to take a biopsy.
6. Overall, Ultrasound is an effective and widely used imaging tool for the initial evaluation and diagnosis of fibroadenomas in breast tissue. It is particularly useful for young women and during pregnancy when the breast tissue may be denser, making mammography less sensitive. However, in some cases, additional imaging modalities or a biopsy may be recommended for a comprehensive assessment as even though Ultrasound is a valuable tool in diagnosing fibroadenomas, it does have some limitations and disadvantages:
 1. **Operator Dependency:** The quality and accuracy of ultrasound examinations can be operator-dependent. The skill and experience of the person performing the Ultrasound may impact the interpretation of the results.
 2. **Limited Sensitivity in Dense Breasts:** In women with dense breast tissue, Ultrasound may have reduced sensitivity. Fibroadenomas can be more challenging to distinguish from other tissues in denser breasts.
 3. **Inability to Provide Tissue Characterization:** Although Ultrasound can identify the presence of a mass and its general characteristics, it cannot definitively characterize the tissue type. For a conclusive diagnosis of fibroadenoma, a biopsy may be required.

4. **Difficulty Detecting Microcalcifications:** Ultrasound is less effective in detecting microcalcifications, which are small calcium deposits associated with benign and malignant breast conditions. Mammography is more adept at identifying microcalcifications.
5. **Limited for Screening in Older Women:** In older women, mammography is often preferred for breast cancer screening. While Ultrasound is useful for specific diagnostic purposes, it may not be the primary screening tool in certain age groups.
6. **Challenges in Identifying Small Lesions:** Very small or subtle fibroadenomas may be challenging to visualize on Ultrasound, particularly if they are located deeper within the breast tissue.

Fine-needle aspiration Cytology is often employed. FNAC is a relatively straightforward and cost-effective method that can exclude other potential diagnoses, suggest a definitive diagnosis, and inform the subsequent surgical approach if necessary. Previous studies have shown that technologies with high sensitivity and accuracy are essential for the detection of tumours, especially in the early stages of breast cancer. One potential technology that may aid in detecting fibroadenomas in accessory breast tissue is a low-profile, wide-band patch antenna [21]. This antenna has been designed to radiate into human breast tissue and has been shown to have a wide input bandwidth, excellent front-to-back ratio, and stable radiation patterns. Using this patch antenna model for breast tumour detection in accessory breast tissue may provide a non-invasive, efficient, and reliable method for early and accurate detection of fibroadenomas in accessory breast tissue. However, in a country like India, with most hospitals catering to low-income groups of patients in low-resource settings, sticking to the protocol as per triple assessment will be the best bet.

4. Conclusion

Indeed, the presence of accessory breast tissue, particularly in the axillary region, can present unique diagnostic challenges, as it may be the site of benign and malignant pathologies similar to those found in the normally located breast. Although fibroadenomas are common in the mammary gland, their occurrence in ectopic breast tissue is relatively rare. Nevertheless, they should be considered when evaluating an axillary mass. Thus, despite the rarity of EBT, it's important to approach axillary swellings with a comprehensive differential diagnosis that includes the possibility of accessory breast tissue and its associated conditions, ensuring appropriate management and intervention when necessary.

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