

Spectrum of Unusual Cytomorphology of Axillary Swellings: A Series of Four Cases

PARIDHI¹, BHUVAN ADHLAKHA², SHIVANI KALHAN³, SHALINI SHUKLA⁴, VIVEK GUPTA⁵



ABSTRACT

The axilla is a triangular area situated anatomically beneath the shoulder joint, between the upper arm and thorax. It contains lymph nodes and numerous non lymphatic tissues such as neurovascular structures, muscle, and fat. Axillary swellings can arise from any of these mesenchymal soft tissues. Fine Needle Aspiration Cytology (FNAC) is the first-line investigative technique widely used in evaluating axillary swellings, as it is a simple outpatient procedure that causes minimal complications, unlike core biopsy, which is invasive and carries a high-risk of bleeding. Hereby, the authors present a case series of four unusual cases: bilateral accessory breast tissue (32-year-old female), bilateral galactocele (28-year-old female), unilateral galactocele (24-year-old female), and fibroadenoma (35-year-old female) in the axilla, all of which were cytomorphologically diagnosed with the aid of FNAC. Axillary lumps can present with a variety of unusual lesions and can pose a significant diagnostic challenge to a clinicians. Although histopathology of the biopsy of the lesion remains the gold standard, clinical features along with imaging can aid in the diagnosis with better patient compliance.

Keywords: Accessory breast, Axilla, Fibroadenoma, Fine needle aspiration cytology, Galactocele

INTRODUCTION

The axilla is a triangular area situated anatomically beneath the shoulder joint, between the upper arm and thorax. It contains lymph nodes and numerous non lymphatic tissues such as neurovascular structures (axillary artery, axillary vein, and brachial plexus), muscle, and fat. Axillary swellings can arise from any of these mesenchymal soft tissues; however, they commonly occur due to enlarged lymph nodes [1]. Enlargement of lymph nodes may be caused by conditions ranging from developmental anomalies, reactive, infective, to neoplastic causes. Benign aetiologies include reactive, infective, or granulomatous causes, while malignant causes include lymphoma, leukaemia, and metastasis from the breast, thyroid, lung, gastrointestinal tract, pancreas, or ovaries [2].

Fine Needle Aspiration Cytology (FNAC) is the first-line investigative technique widely used in evaluating axillary swellings, as it is a simple outpatient procedure. This technique causes minimal complications, unlike core biopsy, which is invasive and carries a high-risk of bleeding. No anaesthesia or hospitalisation is required for this cost-effective technique [1,3]. Hereby, the authors present a case series of four unusual cases of bilateral accessory breast, bilateral galactoceles, unilateral galactocele, and fibroadenoma in the axilla that were cytomorphologically diagnosed with the aid of FNAC.

CASE SERIES

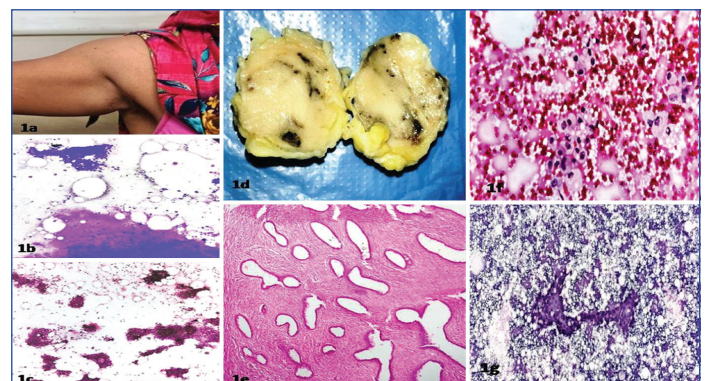
Case 1

A 35-year-old female presented to the surgery Outpatient Department with a complaint of a painful lump in the right axilla for two years. On examination, the swelling was 3x3 cm in size, firm, mobile, non tender, with normal overlying skin [Table/Fig-1a]. There was no other lump in the breast or contralateral axilla or breast. On aspiration, blood-mixed material was yielded. Microscopy revealed fairly cellular smears displaying a bimodal population of cells. Cohesive clusters of ductal epithelial cells admixed with myoepithelial cells were seen in a fibromyxoid background. Numerous bare bipolar nuclei were also seen [Table/Fig-1b,c]. A diagnosis of fibroadenoma in the right accessory breast was made on cytology, and excision was advised for confirmation. The excised mass was sent for histopathology. On

gross examination, the lump was well-circumscribed, fibrofatty from the outside, firm, measuring 3.5x3 cm in size [Table/Fig-1d]. The cut surface was grey-white. Microscopy showed a well-circumscribed mass displaying proliferation of glands and stroma. Glands were lined by inner ductal and outer myoepithelial cells in a pericanalicular growth pattern in a fibrocollagenous stroma [Table/Fig-1e]. There was no evidence of atypia or atypical mitotic activity. The diagnosis of fibroadenoma was confirmed on histopathology.

Case 2

A 24-year-old female presented to the surgical Outpatient Department with a complaint of a right axillary swelling for one year, associated with pain. The swelling was solitary, firm, mobile, and non tender, measuring 2.5x2 cm. There was no history of discharge from the nipple. The ultrasound showed a well-defined hypoechoic lesion in the right axilla, measuring 2.5x2.5 cm with internal echoes and distal enhancement, suggestive of a cystic lesion. On aspiration, thick white

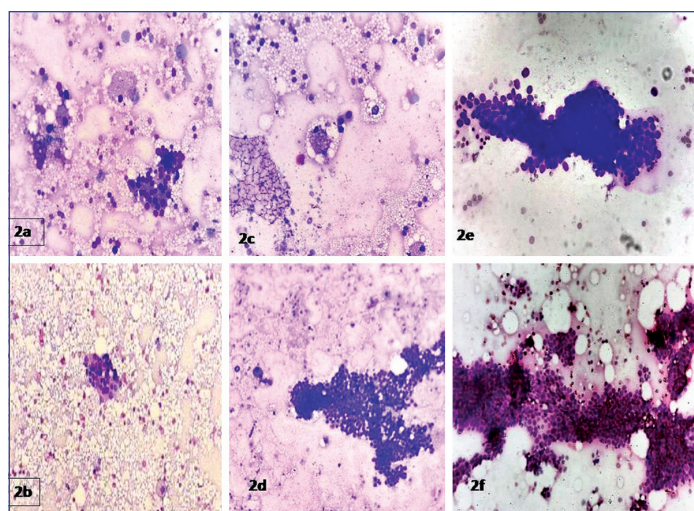


[Table/Fig-1]: a) Clinical picture of right axillary swelling that turned out to be fibroadenoma; b) FNAC smear of right axillary fibroadenoma displaying cohesive clusters of bimodal population of cells in a fibromyxoid background (MGG 200X); c) Numerous bare bipolar nuclei were also seen along with bimodal population of cells of case of right axillary fibroadenoma (PAP 100X); d) Gross picture of right axillary lump which is well circumscribed, fibrofatty from outside, firm, measuring approx 3.5 x 3 cm in size; e) Section showing proliferation of gland and stroma in a pericanalicular growth pattern suggestive of fibroadenoma (H&E 200X); f) FNAC smears showing numerous cystic macrophages admixed with ductal epithelial cells suggestive of right-sided galactocele (MGG 200X); g) FNAC smears showing ductal epithelial cells in a background of granular, amorphous material with lipid droplets suggestive of galactocele (PAP 200X). MGG: May grunwald giemsa stain; PAP: Papanicolaou stain

fluid was yielded. The prepared smears were cellular and showed numerous cystic macrophages admixed with ductal epithelial cells noted in a background of granular, amorphous material with lipid droplets [Table/Fig-1f,g]. A diagnosis of a right-sided galactocele was made on FNAC. On follow-up, there was no recurrence or presence of a similar swelling anywhere else in the body.

Case 3

A 28-year-old female presented to the surgical Outpatient Department with a complaint of bilateral axillary swelling for two years. She had a history of breastfeeding for the last 11 months. There was no other significant positive history, and no history of nipple discharge was present. Both swellings measured 3×3 cm in size and were firm, mobile, non tender with normal overlying skin. On aspiration, thick white milk-like fluid was yielded, and the right-sided aspirate was admixed with blood. No radiological investigations were done. On microscopy, both swellings displayed similar morphology and were cellular. Numerous cystic macrophages admixed with ductal epithelial cells were noted in a background of granular, amorphous material with lipid droplets [Table/Fig-2a-d]. A diagnosis of bilateral galactocele was made on FNAC. On follow-up, there was no recurrence or presence of similar swelling anywhere else in the body.



[Table/Fig-2]: a) FNAC smears from left axillary swelling showing few cystic macrophages along with two small cluster of benign looking ductal and myoepithelial cells suggestive of galactocele (MGG 200X); b) FNAC smears from left axillary swelling showing numerous cystic macrophages along with a cluster of benign looking ductal and myoepithelial cells suggestive of galactocele (PAP 200X); c) FNAC smears from right axillary swelling showing numerous cystic macrophages with amorphous, proteinaceous material in background suggestive of galactocele (MGG 200X); d) FNAC smears from right axillary swelling cystic macrophages with a fragment of ductal and myoepithelial cells suggestive of galactocele (PAP 200X); e) FNAC smears from left axillary swelling showing benign looking ductal and myoepithelial cell cluster suggestive of accessory breast (MGG 200X); f) FNAC smears from right axillary swelling showing benign looking ductal and myoepithelial cell clusters in adipocytic background suggestive of accessory breast (PAP 200X).

Case 4

A 32-year-old female presented to the Surgical Outpatient Department with a complaint of bilateral axillary swelling for three years. The swelling was associated with pain during the menstrual cycle. There was no history of trauma, and no other significant personal or family history was reported. An ultrasound showed heterogeneous hyperechoic lesions measuring 3.5×3.8 cm on the left-side and 3.8×3.7 cm on the right-side, displaying the same appearance as normal glandular breast tissue. The lesions were not connected to the pectoral breast tissue and showed no cystic or solid mass, suggestive of ectopic breast tissue. The axillary artery was patent, and no axillary lymphadenopathy was noted. Both swellings measured 3.5×3.5 cm in size, were ill-defined, non progressive, deep-seated, soft to firm, and non tender. The overlying skin was normal. Upon aspiration, greasy material was yielded. Smears from both swellings showed similar morphology and were

moderately cellular. Benign-looking ductal and myoepithelial cell clusters were noted in an adipocytic background [Table/Fig-2e,f]. A diagnosis of bilateral accessory breast tissue was rendered. On follow-up, there was no recurrence or presence of similar swelling anywhere else in the body.

DISCUSSION

Martin and Ellis first described FNAC for cervical lymph node sampling in 1930 [3]. For the diagnosis of an axillary lump, FNAC is the most suitable modality as it is a cheap, reliable, rapid, and easy technique. The various components comprising mesenchymal tissue, skin, and adnexa in the axilla can result in clinically significant swelling. These lesions range from developmental and reactive to neoplastic conditions. The common presenting symptoms include swelling, tenderness, and restricted movement of the arm. Axillary masses cause a clinical dilemma and have a varied differential diagnosis [4].

An axillary lump can occur due to a variety of benign and malignant lesions and metastasis. The benign spectrum commonly includes infectious granulomatous lymphadenitis, whether suppurative or non suppurative. Other suppurative lesions of the axilla include infections like tularemia, cat scratch disease, Yersinia infection, and lymphogranuloma venereum. Other than infectious causes, benign reactive nodes, connective tissue disease, and neoplastic lesions may present, ranging from indolent neoplasms like lipoma to malignant tumours such as lymphomas and rhabdomyosarcoma [5].

Patients may present with unilateral or bilateral axillary lumps. Causes of bilateral axillary swelling include both benign and malignant entities. Benign causes of bilateral axillary lymphadenopathies are autoimmune diseases like rheumatoid arthritis, Systemic Lupus Erythematosus (SLE), Tuberculosis, sarcoidosis, infectious mononucleosis, and Human Immunodeficiency Virus (HIV). Malignant causes include lymphoma, leukaemia, and metastasis from the thyroid, lung, breast, ovary, pancreas, and Gastrointestinal (GI) tract. The most common malignant cause is metastatic breast carcinoma. However, any of the listed conditions can involve lymph nodes unilaterally as well [2,3].

Ectopic breast is the term used for supernumerary and aberrant breast tissue, which are two distinct entities and occur due to the failed regression of embryonic mammary tissue that may be found anywhere along the milk line, with the most common location being the axilla. Other sites include infraclavicular, subscapular, epigastric, and vulva along the embryonic mammary ridges [6,7]. Accessory breast tissue forms have no connection with the ipsilateral breast. In contrast to supernumerary breasts, they do not communicate with the overlying skin and do not have any organised secretory system [7]. Supernumerary nipples can be identified at birth, whereas ectopic breast tissue becomes noticeable only after hormonal stimulation, usually during puberty, pregnancy, or lactation [8].

In 1915, a classification of supernumerary breast tissue was given as follows: Class I-complete breast with nipple, areola, and glandular tissue; Class II-consists of nipple and glandular tissue but lacks areola; Class III-consists of areola and glandular tissue and lacks nipple; Class IV-consists of glandular tissue only; Class V-consists of nipple and areola but no glandular tissue; Class VI-consists of a nipple only (polythelia); Class VII-consists of an areola only (polythelia areolaris); and Class VIII-consists of a patch of hair only (polythelia pilosa) [9].

Accessory breast is an uncommon finding, occurring in only 0.4-6% of women. It usually presents with a bilateral axillary mass and is a congenital condition that often goes unnoticed for a long time. Sometimes, it may be detected incidentally by mammography or when a patient presents with clinical symptoms such as discomfort, pain, or a palpable lump during menarche, pregnancy, or lactation due to fluctuating hormonal levels [6,7].

Radiologically, fibroglandular elements are noted among adipose tissue, resembling normal breast parenchyma but separate from the main breast tissue [10].

Our first case belongs to class IV bilaterally. As various benign and malignant lesions are present in the axilla, ectopic breast tissue can pose a great diagnostic dilemma even for an expert clinician and can mimic lymphoma or other forms of lymphadenopathy. It is crucial to evaluate such patients as they are associated with other congenital anomalies of the urinary and cardiovascular systems [8,11]. However, no other congenital anomaly or malformation was found in the index case. The accessory breast is prone to similar benign and malignant pathologies as the main breast tissue [7]. Galactocele is one of the benign lesions found in lactating young females [12]. Galactoceles are simple cysts containing milk instead of clear fluid. They may mimic an abscess, fibroadenoma, carcinoma, and other benign and malignant breast masses. They can be diagnosed radiographically with the aid of assessing the amount of fat and viscosity of the fluid. Aspiration of milk generally confirms the diagnosis [13]. Bilateral galactocele in ectopic axillary breast is very rare, and present case appears to be the third case to the best of authors knowledge [12].

Mammary duct obstruction in the lactating breast caused due to trauma, inflammation, or nipple abnormality, and rarely tumour, is the main aetiology for galactocele. This results in the obstruction of the distal terminal duct and, in turn, the dilatation of the proximal unit [14]. Galactocele has a good prognosis as it is a benign condition that resolves on its own without any intervention, mostly after the cessation of lactation [14].

The FNAC aspirate is thick, chalky white granular material that imparts a gritty sensation during aspiration. Smears reveal discrete and polymorphic refractile crystals of various sizes and shapes along with ductal and myoepithelial cells in the surrounding proteinaceous, granular background. For palpable lumps suspicious for malignancy during pregnancy and the postpartum period, FNAC is a good, easy, cheap, and well-adapted technique for the preliminary evaluation [14,15].

CONCLUSION(S)

An axillary lump can present with a variety of unusual lesions and can pose a great diagnostic challenge for a clinician. Although histopathology of the biopsy of the lesion remains the gold

standard, clinical features along with imaging can aid the diagnosis with better patient compliance. FNAC is a rapid, less invasive, less traumatic, easily accessible, and cost-effective diagnostic tool to differentiate between the benign and malignant nature of the swelling.

REFERENCES

- [1] Gordon A, Alsayouri K. Anatomy, shoulder and upper limb, axilla. 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK547723/>.
- [2] Zhang M, Ahn RW, Hayes JC, Seiler SJ, Mootz AR, Porembka JH. Axillary lymphadenopathy in the COVID-19 era: What the radiologist needs to know. *Radiographics*. 2022;40(7):1897-911. <https://doi.org/10.1148/rg.220045>.
- [3] Ibrahim RSM, Talaath-Hamed S, Adel E. Value of FNAC in abnormal axillary lymph nodes with non-specific mammograms. *Egypt. J. Radiol. Nucl. Med.* 2018;49(2):385-93. <https://doi.org/https://doi.org/10.1016/j.ejrm.2017.12.012>.
- [4] Gopika A, Shilpa N, Kusumanjali B. An approach to axillary swellings cytomorphological (fine needle aspiration cytology) study. *Asian J. Med. Sci.* 2022;13(4):151-55. <https://doi.org/10.3126/ajms.v13i4.43087>.
- [5] Bello U, Omotara SM. Spectrum of diseases in the axilla: A histopathological analysis of axillary masses. *Niger J Basic Clin Sci.* 2017;14:96-100.
- [6] Daga S, Phatak S, Khan S, Rawekar S. Axillary galactocele of ectopic breast: Ultrasound and mammography correlation. *Med J DY Patil Vidyapeeth [serial online]* 2018;11:242-44. Available from: <https://www.mjdrpv.org/text.asp?2018/11/3/242/235554>.
- [7] Husain M, Khan S, Bhat A, Hajini F. Accessory breast tissue mimicking pedunculated lipoma. *BMJ Case Rep.* 2014;2014:bcr2014204990. Doi: 10.1136/bcr-2014-204990. PMID: 25006058; PMCID: PMC4091128.
- [8] Velanovich V. Ectopic breast tissue, supernumerary breasts, and supernumerary nipples. *South Med J.* 1995;88(9):903-06. Doi: 10.1097/00007611-199509000-00002. PMID: 7660204.
- [9] Amaranathan A, Balaguruswamy K, Bhat RV, Bora MK. An ectopic breast tissue presenting with fibroadenoma in axilla. *Case Reports in Surgery.* 2013;2013:947295. <https://doi.org/10.1155/2013/947295>.
- [10] Lai TKB, Wong T, Chau CM, Fung WY, Chan RLS, Yung AWT, Ma JKF. Differential diagnoses of axillary lesions: A pictorial essay. *Hong Kong J. Radiol.* 2011;24(3):219-28. <https://doi.org/10.12809/HKJR2117394>.
- [11] Lee JY. Giant epidermal inclusion cyst of the axilla: A case report with diagnostic ultrasound imaging features. *Radiol Case Rep.* 2021;17(1):64-67. Doi: 10.1016/j.radcr.2021.10.007. PMID: 34765062; PMCID: PMC8571480.
- [12] Prasad KR, Chandra AS, Ramarao V. Bilateral axillary galactocele: A case report. *Emedinexus.us.com.* (n.d.). <https://www.emedinexus.com/post/30237/bilateral-axillary-galactocele-a-case-report>.
- [13] Farrokh D, Alamdaran A, Yousefi F, Abbasi B. Galactocele in the axillary accessory breast mimicking suspicious solid mass on ultrasound. *Case Reports in Obstetrics and Gynecology.* 2017;2017:4807013. <https://doi.org/10.1155/2017/4807013>.
- [14] Gada PB, Bakhshi G. Galactocele. 2023. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK578180/>.
- [15] Zaman, S, Gupta, R, Gupta, S. Crystallizing galactocele of the breast masquerading as a malignancy: Report of a rare case with cytological diagnosis. *Diagn. Cytopathol.* 2022;50(8):E236-39. Doi: 10.1002/dc.24974.

PARTICULARS OF CONTRIBUTORS:

1. Senior Resident, Department of Pathology, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India.
2. Assistant Professor, Department of Pathology, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India.
3. Professor and Head, Department of Pathology, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India.
4. Assistant Professor, Department of Pathology, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India.
5. Associate Professor, Department of Pathology, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Bhuvan Adhlakha,
Assistant Professor, Department of Pathology, Government Institute of Medical Sciences, Greater Noida-201310, Uttar Pradesh, India.
E-mail: bhuvanadhlakha@gmail.com

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Sep 20, 2023
- Manual Googling: Nov 20, 2023
- iThenticate Software: Nov 21, 2023 (9%)

ETYMOLOGY: Author Origin

EMENDATIONS: 4

Date of Submission: **Sep 19, 2023**

Date of Peer Review: **Nov 12, 2023**

Date of Acceptance: **Nov 23, 2023**

Date of Publishing: **Mar 01, 2024**