

Unveiling the rarity: A case of crystallizing galactocele in a young female

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Dear editor,

Galactocele or lactocele, a benign breast lesion commonly found in pregnant individuals during the third trimester, can also occur in infants and premenopausal women. This may result from transplacental passage of prolactin or hormonal stimulation/oral contraceptive use, and is associated with conditions such as breast surgery and pituitary adenomas. The fundamental pathogenesis involves lactiferous duct blockage, leading to the encapsulation of milk products. While galactocele is a routine encounter for obstetricians, this particular variation poses a diagnostic challenge for radiologists and cytologists due to its rarity. The present report also gives a brief review of literature, making it the 9th case ever reported in literature (**Table 1**).

Here, we present an unusual case of a 22-year-old female who presented with a non-tender lump in her right breast for last 5 months. She delivered a baby around one and half years back and wasn't feeding the baby presently. On physical examination, a discrete, mobile, firm to hard lump, measuring 2x2 cm was palpable in the upper inner quadrant of right breast. Ultrasonography revealed an iso to hyperechoic lesion at the 11'o clock position, 1.2 cm away from the nipple areola complex with peripheral calcification. A radiological impression of BIRADS 3 (probably benign) was proffered along with a cytological conformation by fine needle aspiration (FNA). FNA yielded scant, thick, chalky white material. Cytological smears were paucicellular and showed predominantly a proteinaceous, amorphous, granular background (**Fig 1a,b**). Numerous crystals of varying shapes and sizes were observed along with occasional interspersed clusters of benign ductal epithelial cells, myoepithelial cells, stromal

fragments and foamy macrophages (**Fig 1c-d**). These crystals exhibited positive birefringence under polarizing microscope (**Fig 1e,f**). Based on the clinical history and cytological findings, a diagnosis of Crystallizing galactocele was established.

While the majority of palpable breast lesions in pregnant or lactating individuals are benign, approximately 3% exhibit malignancy, necessitating prompt attention.⁹ Fine-needle aspiration cytology (FNAC) emerges as a straightforward, cost-effective, and minimally invasive method for the initial evaluation of clinically suspicious breast masses during pregnancy and lactation.¹⁰ This procedure offers the advantage of avoiding surgical trauma and anesthesia, with the additional benefit of being therapeutic in cases of galactocele. Milk comprises a diverse array of proteins and minerals. Long standing milky fluid acts as a nidus for crystal formation. The formation of crystals in galactoceles is primarily influenced by the supersaturation of substances

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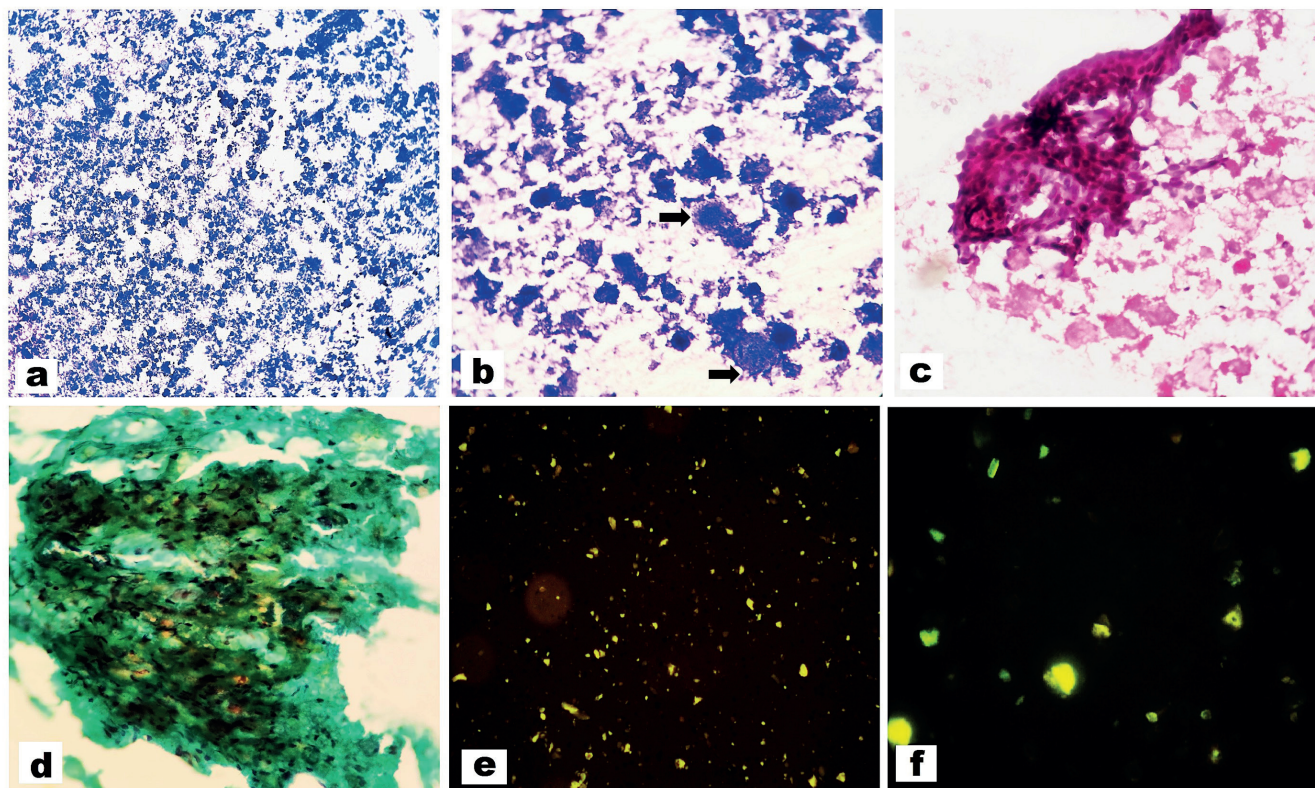


Fig 1: (a,b) Numerous dark blue to purple crystals of variable size and shape with angulated borders in an amorphous proteinaceous background along with occasional foamy macrophages (arrows) (May Grunwald-Giemsa 40x, 400x); (c,d) Occasional cluster of benign ductal epithelial cells and stromal fragments seen (400x); (e,f) Cytological smear showing numerous birefringent crystals of varying size and shape with angulated borders (40x,400x).

Table1: Brief review of literature showing cases of crystallizing galactocele

| Authors | Age | Location | History of lactation and last child birth | Clinical/radiological diagnosis | FNAC findings |
|-----------------------------------|----------|------------------------------------------|-------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Raso et al (1997) ¹ | 23 years | Upper middle area, left breast | Present, 2 months | Lactating adenoma or fibroadenoma | Numerous, distinct, compact, semitransparent to dark blue/ purple, refractile crystals along with loosely cohesive multivacuolated, foam cells. |
| Nikumbh et al (2013) ² | 27 years | Upper outer quadrant of right breast | Present, 1 year | Fibroadenoma | Numerous, compact, semitransparent to dark blue/ purple refractile crystals of variable shapes and sizes in a granular, amorphous and proteinaceous background |
| Nuzhat et al (2015) ³ | 35 years | Lower outer quadrant of left breast | Present, 3 years | Fibroadenoma | Birefringent angulated crystals of varying size and shape in an amorphous material |
| Shetty et al (2016) ⁴ | 25 years | Upper outer quadrant of the right breast | Present, 9 months | NA | Sheaves of birefringent needle like structures of varying sizes in an amorphous, eosinophilic background along with lipid micelles, foamy macrophages |
| Jaseem et al (2018) ⁵ | 26 years | Right breast | Present, 1 year | NA | Numerous semitransparent positive birefringent crystals in acellular, granular amorphous proteinaceous background along with frothy appearing micelles |

| Authors | Age | Location | History of lactation and last child birth | Clinical/radiological diagnosis | FNAC findings |
|------------------------------------|----------|--------------------------------------|-------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Singla et al (2020) ⁶ | 22 years | Upper inner quadrant of right breast | Present, 1 year 3 months | Fibroadenoma | Numerous, distinct, compact, and semitransparent to dark blue/purple refractile crystals in background of granular, amorphous, and proteinaceous material along with lipid micelles |
| Varshney et al (2021) ⁷ | 26 years | Lower inner quadrant of left breast | Present, 10 months | Malignant lesion (low risk) BIRADS 4a | Numerous angulated crystals of varying sizes in a background of amorphous, granular proteinaceous material |
| Raj et al (2021) ⁸ | 25 years | Left axilla | Present, 1 year 10 months | Malignant lesion | Abundant granular amorphous proteinaceous material with variety of colorless, eosinophilic, basophilic, yellow-brown granular crystals along with lipid micelles |
| Present case | 22 years | Upper inner quadrant of right breast | Present, 1 year 6 months | Benign lesion BIRADS 3 | Paucicellular smears with a predominant proteinaceous, amorphous, granular background and numerous concretions of varying shapes and sizes were observed and occasional clusters of benign ductal epithelial cells and myoepithelial cells |

surpassing their solubility in an acidic environment. This often results in the creation of calcium lactate crystals or, in rare instances, tyrosine crystals. While most galactoceles typically resolve autonomously as hormonal fluctuations associated with lactation diminish, those with crystallization or solid formation

necessitate timely intervention. This report serves as a comprehensive review of all documented cases of crystallizing galactoceles. Given its rarity, to the best of our knowledge, this represents the 9th case report of crystallizing galactoceles diagnosed through FNAC.

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