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Review Article

Galactocele of the breast recent updates: Review

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Abstract

Galactoceles are benign, milk filled cysts related to lactation cause by a persistent obstruction of the lactiferous duct. On clinico histopathology it is characterised by triad of secretory breast epithelium, prolactin stimulus and ductal obstruction results in cyst formation. A 25 years old female was referred to our hospital with the chief complaint of a non-tender, oval, left breast lump since one year duration with now as sudden increase in size. History of child breast feeding of two years. On local examination, well-circumscribed, round, fluctuating, lump measuring 4 x 2.5 cm in 5-7 o'clock position was noted. Sonomammographic differentials diagnosis of? fibroadenoma with cystic changes, galactocele versus cyst? lactational adenoma (BIRADS-IVa) were suggested. The color Doppler evaluation demonstrated no vascularity within the mass or surrounding breast tissue. FNAC Left breast lump reported as suggestive of fibroadenoma with lactational changes. Patient underwent left breast lump excision. On microscopy showed breast tissue with dilated anastomosing channels lined by cuboidal epithelium. Multiple variable sized cysts lined by cuboidal or flat epithelial cells were noted. The cyst are linned by epithelium having regular nuclei with cytoplasmic vacuolations, reported as Galactocele left breast. Galactocele shows the triad of secretory breast epithelium, prolactin stimulation, and ductal blockage. The galactocele is benign and treatable lesions. The complicated case poses a diagnostic dilemma and a therapeutic challenge.

Keywords: Galactocele breast, Retention cyst, Lacteal cyst, Milk cyst.

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1. Introduction

The term galactocele is derived from the Greek words *galatea*, meaning milky white, and *cele*, meaning pouch. Galactoceles, occasionally termed lactocele or a lacteal cyst, are benign milk retention cysts that primarily arise in lactating or recently lactating patients due to a persistent obstruction of the lactiferous duct. Galactocele of the breast is most commonly seen in young women in association with lactation or some period after lactation. There are several factors described by Winkler J, stated that galactocele is initiated by activation of secretory breast epithelium, prolactin stimulation, and ductal obstruction.[1]

Previous hormonal contraceptive use, pregnancy, after breast augmentation and recent breastfeeding may also be contributing factors.[2] A prolactin trigger is another condition important to form a galactocele. In recent studies literature shows periareolar incisions, subglandular implants, breast augmentation are associated with to form a galactocele. It may rarely be complicated by a secondary infection, acute mastitis, abscess formation, Breast milk fistula, Inspissated galactocele.[3,4]

1.1. Instance

A 25 years old female was referred to our hospital with the chief complaint of a non-tender, oval, left breast lump since 1 year duration with now as sudden increase in size. History of child breast feeding of two years. On local examination,

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well-circumscribed, round, fluctuating, lump measuring 4 x 2.5 cm in 5-7 o'clock position was noted. Lump was firm, not fixed to breast tissue and mobile. No reagional or any other lymph node were palpable. The right breast was normal. Sonomammography left Breast showed a well-circumscribed, oval, wider than taller heteroechoic predominantly isoechoic lesion with few ill-defined anechoic cystic areas

Her obstetric history was, 2 year back, she had full term, spontaneous, vaginal delivery of a male child.She had breast fed her child for two year and thereafter, intermittently to the day of presentation. History of repeated bites from baby at feeding was given. Her routine blood, biochemical and endocrinal parameters were within normal limits. The clinical impression was of a fibroadenoma left breast. The Sonomammography left Breast showed a well-circumscribed, oval, wider than taller heteroechoic predominantly isoechoic lesion with few ill-defined anechoic cystic areas within and showed significant posterior acoustic enhancement, measuring (~ 4.6 x 2.0 x 2.4 cm in dimensions) in lower quadrants of left breast at 5-7 'o clock position at a distance of (~ 0.5 mm) from skin surface and (~ 2.0 cm) from nipple areolar complex (**Figure 1**). Few subcentimetric lymph nodes with maintained fatty hilum noted in the axilla were noted. Based on the sonomammographic findings, .differentials diagnosis included were? fibroadenoma with cystic changes, galactocele versus cyst? lactational adenoma (BIRADS-IVa) were suggested. The Color Doppler evaluation demonstrated no vascularity within the mass or surrounding breast tissue. The FNAC Left breast lump was performed, reported as features suggestive of fibroadenoma with lactational changes. Patient underwent left breast lump excision.

On gross single, well-circumscribed, soft to firm, mass measuring 4.2 x 2.5 x 2.0 cm. on cut section it was gery white, firm, solid and multicystic. The cysts were filled with thick, chalky white milky fluid. The lesion was well circumscribed borders (**Figure 1**, **Figure 2**).

Figure 1: Sonomammography left Breast showed a well-circumscribed, oval heteroechoic predominantly isoechoic lesion.

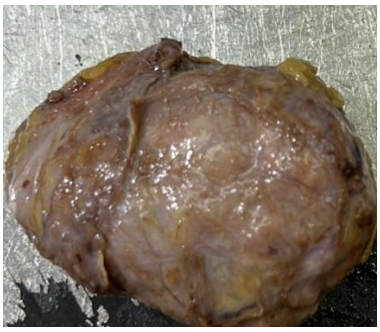

Figure 2: On gross single, well-circumscribed, soft to firm, breast mass.

Figure 3: Breast mass on cut section is gery white, firm, cystic. The cysts were filled with thick, chalky white milky fluid.

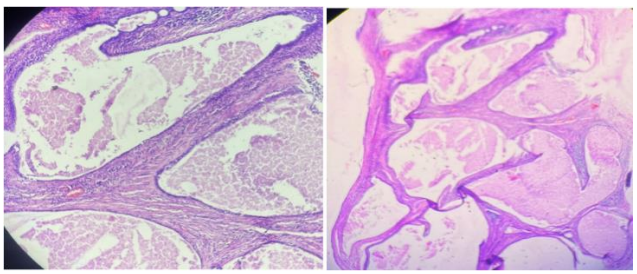

Figure 4: Microscopy showing breast tissue with dilated, multiple, variable sized cysts lined by cuboidal or flat epithelial cells.(H &E stain.100x)

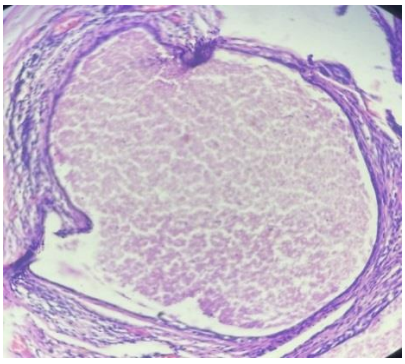

Figure 5: Cyst lined by cuboidal epithelium having regular nuclei with cytoplasmic vacuolation, Cyst filled with granular, amorphous, proteinaceous material admixed with frothy lipid micelles.(H &E stain.400x)

On microscopic examination showed breast tissue with dilated anastomosing channels lined by cuboidal epithelium. Multiple variable sized cysts lined by cuboidal or flat epithelial cells were noted. The cyst are linned by epithelium having regular nuclei with cytoplasmic vacuolations (**Figure 4**). Areas of granular, amorphous, proteinaceous material in the background admixed with frothy appearing lipid micelles were noted. The cysts are surrounded by fibrous wall of varying thickness and at places showing repture. Areas of focal dense chronic inflammatory cell infiltration with numerous macrophages were noted. In areas apocrine metaplasia was noted. On histopathological findings reported as Galactocele left breast.

2. Discussion

2.1. Epidemiology

Galactoceles are benign retention cyst of the breast known as a galactocele, lactocele, or lacteal cyst is characterized as a milk-filled cyst. It accounts for approximately 4 to 5% of all breast lumps. 5 These are seen to be primarily arising in lactating or recently lactating women due to a persistent obstruction of the lactiferous duct. There occurrence is seen mostly in third trimester of pregnancy. The age presentation noted mostly in second to fifth decade of life with a peak incidence in fourth to fifth decade. After lactation cessation galactoceles is most commonly noted in patients.The women are almost exclusively affected, but rarely few reported cases in men associated with small silent retention cysts in neonatal period were seen. The first case of galactocele in male infants was reported in 1880 by de Cattani.[6]

Rarely, galactocele can occur in adult men secondary to hyperprolactinemia.[7]

2.2. Pathogenesis

The development of a galactocele is related to obstruction of a lactiferous duct. The various pathogenesis related causes are due to inflammation, trauma, hormonal, an anatomical anomaly or postsurgical. The obstruction leads to milk accumulation, resulting in cyst formation. The proposed theory of postsurgical galactocele formation is surgical stimulation of the intercostal nerves leading to autonomic control over central neurogenic paths, diminishing dopamine output into the hypophyseal portal circulation, and increasing circulating prolactin levels and milk secretion.[8] The milk within the cyst may become inspissated over time, leading to the characteristic appearance on imaging studies. Crystallizing galactocele is a rare benign condition. The crystallizing galactocele should be considered whenever a milky, viscous fluid is aspirated from the breast mass. This crystallization can lead to a chalky, viscous substance and may mimic malignancy. Few cases of crystallizing galactocele have been reported reported in literature.[9]

2.3. Risk factors and associations

The various etiological factors for development of galactocele are related to hormones, oral contraceptive pills. The estrogen and progesterone contribute to mammogenesis to secretory breast epithelium. The prolactin stimulus contribute at transplacental passage of prolactin, pituitary adenoma, hyperprolactinemia due to prolactinomas progress toward pathogenesis. Other cause is related to ductal obstruction, postaugmentation following periareolar incisions etc. The curtain drugs such as metoclopramide / domperidone can increase the risk of galactocele formation.

The risk factors for galactoceles includes primiparity, difficult breastfeeding,sustained breast trauma, bites from baby at feeding, mild trauma from aggressively squeezing the nipple to relieve a ductal obstruction or a "plugged duct," may precipitate an inflammatory reaction, which leads to galactocele formation.

Recently, galactocele after aesthetic breast augmentation with silicone implants have also been reported.[10]

2.4. Galactocele: Clinical features

This obstruction of the lactiferous duct causes milk to accumulate in a cystic structure, which can present clinically as a mass of varying size, from a barely palpable mass to a large mass measuring greater than 10 cm. Typically presenting as a moderately firm, painless unilateral or bilateral mass. The lesions are nontender, firm, discrete, movable, often associated with a milky discharge .History of gradually or rapidly increase in size, with fluctuations. The location are most commonly in breast, unilateral / bilateral but may occur anywhere along the milk line extending from the axilla to the groin. Galactocele has a propensity to form in the retroareolar region of the breasts.[11]

The diagnosis is done with triple assessment as clinical examination, radiological and histologic correlation.

2.5. Radio imaging characteristics of: Galactocele

On radio imaging appearance of galactocele depends on the amount of fat and proteinaceous material present in the cyst and also the viscosity of the fluid. On ultrasound shows solitary, well defined, anechoic lesion .Variable echogenicity, echotexture may be heterogeneous depending on fat and protein content. Fat-fluid level, with the hypo- or hyperechogenic fat layer occupying the nondependent or upper part of the cyst. Posterior acoustic shadowing mimics malignancy.[12] On Colour Doppler imaging there is lack of internal vascularity. The mammography of galactoceles varies depending on the fat and protein content and the consistency of the fluid.[13] On mediolateral mammographic view, fat-fluid levels are usually seen with the patient in upright position and a horizontal X-ray beam.[14] Salvador et al. reported a wavy line separating the mass into hyperechoic and hypoechoic portions or fat-fluid level.[15]

2.6. Histopathology of Galactocele

A fine-needle aspiration cytology (FNAC) may be performed for both diagnostic and therapeutic purposes.On FNAC shows thick, chalky white material with a gritty sensation during aspiration. Also noted are well defined purple crystals, which show positive birefringence on granular, amorphous, proteinaceous background.

On histomorphology, microscopic features shows multiple variable sized anastomosing cysts that are lined by cuboidal or flat epithelium with cytoplasmic vacuolations due to lipid accumulation. The inflammatory reaction depends on leakage of cyst contents. Fat necrosis can be present in few cases. The presence of milk is confirmed chemically by a positive mucic acid test.

2.7. Immunohistochemistry and differentials of Galactocele

Immunohistochemical techniques such as GATA-3, characteristic of the breast epithelium, can contribute to the diagnosis.

Differentiating galactoceles from other breast pathologies, such as lactating adenoma, cysts, hamartoma, fibroadenomas, fibrocystic changes, breast abscesses, or malignancies are important.[16,17] The complication associated with galactoceles is infection, abscess formations are reported.

2.8. Treatment and prognosis in galactocele

The treatment of a galactocele is depends on symptom severity, lesional size, and the presence of infection. In few cases the conservative line of management is observed as lesions may resolves spontaneously on cessation of lactation. While in other cases aspiration of cyst material including drainage can resolve the lesion.[18] In few cases may require repeated draining.

The symptomatic or infected patients often require medical intervention, and antibiotics. In large lumps, complicated cases surgical excision can be performed.[19] The overall prognosis of a galactocele is excellent.

3. Conclusion

Galactocele is a milk-filled cyst that can develop in the breast during pregnancy and lactation. Galactoceles may shows a wide range of sonographic appearances. Galactocele shows the triad of secretory breast epithelium, prolactin stimulation, and ductal blockage. These lesions can mimic other lesions of the breast both benign and malignant. The galactocele is benign and treatable lesions. The complicated case poses a diagnostic dilemma and a therapeutic challenges.

4. Source of Funding

None.

5. Conflict of Interest

None.

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