

Incidence of epidermoid cyst of the breast: An analysis on clinico-pathological and radiological correlation

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Abstract

Introduction: Breast diseases are the major pathological lesion occurring among Tropical females with high co-morbidities. Cystic disease of breast is a broad entity often having many differentials clinically reaching out to the Pathologists. Epidermoid cysts of breast are condition occurring in cutaneous adnexae of extremities and its occurrence in breast is a rare entity. While trauma/therapeutic surgery including trucut biopsy is the major underlying cause, it is characterized by cystic lesion in dermis especially in peri-areolar region. Though radio-imaging serves to pick up cystic lesions, it downplays in categorizing the nature of the cyst. Cytology plays a major role in diagnosing the disease, appropriate clinico-pathological correlation with radio-imaging may improvise early pick up of this condition, thereby aiding in prompt treatment.

Materials and Methods: The present study was conducted for a period of 4 years with specific inclusion and exclusion criteria. All the clinical details including history of surgery, trauma, site, socio-demography, size, radio diagnosis etc, were documented in a proforma. Patients are subjected to routine cytology procedure at clinician's request. Biopsy was done in specific indicated cases as therapeutic procedure and also for histological correlation the data are entered in tables and analysis was done aiming to frame clinico-pathological correlation with radio-imaging interpretation.

Results and Observations: A total number of 10 cases were analysed in the study period. Left breast was predominantly affected and age incidence ranged between 3rd to 5th decade. While retro-areolar region was commonly involved, clinical diagnosis had many differentials. Cytology aspirates showed pultaceous to blood mixed material and corresponding Cytology showed keratinous cells with inflammation which were confirmed on histology on 7 available cases.

Conclusion: Epidermoid cyst of breast is a rare condition and should be kept as one of the differential diagnosis by clinician and Pathologist while dealing with cystic breast diseases. Cytology procedure holds good in effective diagnosis of the condition and Clinico-Pathological correlation aids in improvising early diagnosis thereby alleviating patient's stress.

Keywords: Epidermoid cyst of Breast, FNAC, Histopathology, Radio-imaging.

Introduction

Breast being mammary organ in humans located in retrosternal region, it is well developed in females compared to males which stays as a rudimentary organ.¹ Breasts being subjected to hormonal influences, it serves as a platform of various pathological conditions especially among reproductive females. Breast diseases are broadly categorized into non-neoplastic and neoplastic lesions, the incidence of the former entity holds an upper compared to cancerous lesions.² It had been postulated that breast lesions ranks the top rendering morbidities and associated mortalities among females in the Tropical countries. Non-neoplastic lesions are sub-categorized into many conditions namely inflammatory breast diseases, fat necrosis, pregnancy induced changes and cystic lesions of the breast.³

Cystic disease of the breast carries around 15-30% of overall breast lesions, it mostly presents with benign and malignant tumour with varied proportions.⁴ Many a times cystic lesions becomes an incidental findings and it usually presents in the 4th and 5th decade of life.^{4,5} Keratinous cyst usually termed as 'Epidermal cyst' is a common cystic lesion of skin adnexa manifesting all over the body in various age groups irrespective of the gender.⁶ It is unusual condition due to blockage in the

sebaceous ducts, excessive production of keratin flakes with accumulation of sebum as pultaceous material.⁷ Researchers identified prick injury, chronic irritation, high pressure dependent parts serve the major reasons for etiopathogenesis of keratinous cyst.^{7,8}

While keratinous cyst is very commoner in extremities and cutaneous structures, epidermal cyst of the breast is a rare and very unusual condition. Literature study on epidermal cystic disease of breast are available proposing various analysis on causes and manifestations.⁹ The clinical presentation of this condition is vague often carrying away the clinician towards epithelial cystic lesions subjecting to various diagnostic procedures. Radiological procedures has high significant diagnostic role in picking up cystic lesions of epithelial origin, but its efficacy in keratinous cyst of breast is debatable. Thus diagnosis epidermal breast cyst on clinical and radiological presentation is challenging as many differentials are encountered.^{9,10}

Fine needle aspiration cytology (FNAC) is a simple, minimally invasive day care diagnostic procedure which is proved to have high sensitivity and specificity on cystic lesions of breast.¹¹ However research analysis on the diagnostic utility of FNAC on epidermal cyst of breast especially in correlation with clinic-radiological profile is very sparse and seldom

available among Tropical studies.^{11,12} The present research study is intended to carry out an analysis on diagnostic role of FNAC in epidermal cystic lesion of breast with attempt to correlate with its subsequent clinical diagnosis and radiological findings thereby emphasizing the efficacy of cytological interpretations

Materials and Methods

The present cross-sectional study was performed at Diagnostic Pathology Laboratory, Puduchery for a period of 4 years after ethical clearance. Patients presented with cystic lesions of breast and referred to the cytology laboratory by the surgeons for FNAC procedure are included. Patients with known history of fibro epithelial and fibrocystic lesions of breast, history of surgery (excision/lumpectomy), proved case of malignancy, etc. are excluded from the study. All the relevant clinical data including age, occupation, history of trauma, socio-demographic profile, lactating history were documented in proforma format including provisional clinical diagnosis by the referring surgeon for analysis.

Radiological imaging with interpretations especially ultrasonographic scanning, mammography (in available cases) were noted. FNAC procedure and staining of slides was performed as per standard protocol in reference to standard operating procedure. The cystic lesion was described in terms of number, size, appearance, consistency, side and site of breast, associated, inflammatory signs, nature of aspirate, site of injury (if any) etc. Histopathological evaluation was done in cases where tissue biopsy was performed with indications. The findings were tabulated and analysis

was performed in terms of correlation between clinico-radiological features with laboratory interpretations.

Results and observations

The present study involved study population of 10 cases satisfying inclusion and exclusion criteria for a period of 4 years duration. Most of the patients presented were from the socio-demography of South east coastal regions in and around of Puducherry. Among the studied cases, most of the cases were diagnosed to be breast cystic abscess clinically in 4 cases followed by fibrocystic disease and malignancy each 3 cases as elaborated in Table 1. Predominant age group was between 3rd to 5th decade of life as shown in Table-2. Interestingly all the studied cases showed involvement of left breast especially retroareolar and outer quadrant.

Radiological imaging played a vital role in picking up cystic disease of breast. However sub-categorization of cystic disease of breast could not be done on radiology in any of the cases as shown in Table 3. Mammographic imaging was available in one of the case which appeared to be malignant clinically, rating it as BIRADS-IV, later turned be keratinous cyst on cytomorphology which was proved on histology as well. Subsequent excision biopsy specimen was available in 7 indicated cases where significant clinico-cytological variation encountered. All the cases showed Keratinous cyst microscopically on H & E stained slides few cases showing super-added infection and stromal inflammation correlating with cyto-morphology as described in Table 3.

Table 1: Clinico-Cytopathological profile of keratinous cyst of breast

Clinical Diagnosis	Cyto-morphological Interpretations
Breast Abscess	Infected keratinous cyst – (n=4)
Cystic disease of breast	Epidermal cystic lesion – (n=3)
Carcinoma Breast	Keratinous cyst with stromal inflammation (n=3)

Table 2: Incidence of Age & Site predilection of keratinous cyst of breast

Age(in years)	BreastSide involved	Quadrant	Nature of aspirate
20-30(n=3)	Left side	Retro-areolar	Greasy
31-40(n=5)	Left side	Upper &Outer	Pultaceous material
41-50(n=2)	Left side	Lateral and retroareolar	Bloody aspirate

Table 3: Comparison of Cytohistological morphology with radio-imaging

Radiological imaging	Cyto-morphology	Histopathology
Cyst with calcified lesion	Keratinous cyst with degenerative changes	Epidermal cyst (n=2)
Cystic lesion for evaluation	Epidermal cyst with inflammation	Epidermal cyst with suppuration (n=1)
Fibrocystic disease breast	Keratinous cyst	Epidermal cyst (n=1)
BIRADS-IV- Suspicious of malignancy	Epidermal cyst with secondary infection	Epidermal cyst with ulceration (n=3)

Discussion

Breast lesions being very common pathological condition, always panics the patients with anxiety due to its associated co-morbidities.^{1,2} Cystic lesions being common cutaneous conditions, often turns to be simple benign and some instances is associated with underlying malignant etiology.³ Epidermoid cyst refers to the cysts that result from proliferation and implantation of epidermal elements within a circumscribed space in the dermis mostly commonly encountered in extremities, head and neck, truncal region and back.^{4,5}

Epidermoid keratinous cyst of the breast is an extremely rare condition and it presents as a lump that is primarily localized in the periareolar region, thus having many clinical differentials.^{5,6} The underlying etiopathogenesis proposed includes trauma or surgery which stimulates epithelial proliferation with squamous metaplasia and inflammation of pilosebaceous structures together leading to cystic reaction in the dermis.⁷ In the present study, 5 cases had history of surgery (trucut biopsy, lumpectomy) for various breast lesion indications and keratinous cyst arising in areas adjacent to biopsy site especially retroareolar region as shown in (Fig. 1). Left side preponderance was noted in all the cases, the reason attributed being pin prick injury during customary traditional attires in this socio-demographic region especially among 4th and 5th decade of life, thus correlating with previous Research works.^{8,9} The reason attributes includes blockage of pilosebaceous units and adnexal structures leading to cystic reaction in the dermis.⁹

Diagnostic modalities includes cytology, radiological methods and biopsy study. Research studies on correlation on clinico-radiological impression with pathological diagnosis are sparsely available especially among the Tropical countries.¹⁰ Radio-imaging usually describe epidermoid cysts as benign masses with well-circumscribed margins with secondary degenerative changes, often not sub-categorizing the cystic lesion as evident in the present and prior studies as well.¹¹ Excision biopsy being an invasive procedure, it plays a vital role in therapeutic rather than diagnostic part/FNAC being an highly sensitive tool for cystic disease of the breast often targets in differentiating between benign and malignant condition.¹¹ Cytomorphologically it shows keratinous cyst both nucleate and anucleate type with inflammatory cell infiltrate pointing towards secondary infection.¹² In the present study similar findings were observed in the cases analysed which were proved in subsequent available histopathological evaluation as shown in (Fig. 2 & 3). As cystic lesion harbours infection with risk for spontaneous rupture, simple excision biopsy serves as mainstay for treatment modality though malignant transformation is extremely rare as evident from the present study analysis.



Fig. 1: Clinical image of epidermoid cyst; arrow point- Trucut biopsy site

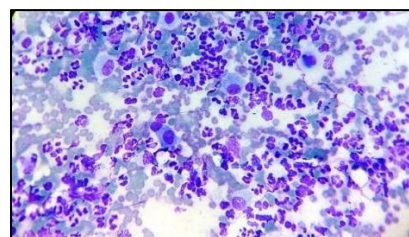


Fig. 2: Cytomorphology showing nucleate keratinous cells admixed with inflammatory cells and few ductal epithelial cells, MGG -40X

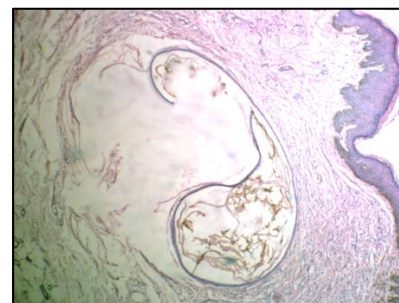


Fig. 3: Excision biopsy of keratinous cyst of breast squamous lining and sub-epithelium showing cyst filled with keratin flakes admixed with stromal inflammation. H&E,40X

Conclusion

Epidermoid breast cyst are common cystic lesion than assumed to be, usually occurring in left breast among reproductive age females. Keratinous cystic lesion should be kept as one of the differentials by the Pathologists while dealing with cystic lesion. FNAC being a simple day care procedure has good efficacy in picking up the condition thereby alleviating patient's anxiety. Excision biopsy stays standard treatment modality for epidermoid breast cyst and also confirming the cytomorphological diagnosis.

References

1. Taira N, Aogi K, Ohsumi S, Takashima S, Kawamura S and Nishimura R: Epidermal inclusion cyst of the breast. *Breast Cancer* 14; 2007:434-37.
2. Meeta S, Barkha M, Shyama J, Epidermal inclusion cyst in breast: is it sorare? *J. Cytol.* 29 (3);(2012):169-172.

3. Das DK, Junaid TA, Mathews SB, et al., Fine needle aspiration cytology diagnosis of male breast lesions. A study of 185 cases, *Acta Cytol.* 39 ;(1995:):870–876.
4. Solak O, Tunay K, Haktanir NT, Esme K., Giant epidermoid cyst in the sternum region, *Thorac. Cardiovasc. Surg.* 56 (4);(2008):243–245.
5. Suhani AL, Meena K, Ali S and Thomas S: Squamous cell carcinoma arising in epidermal inclusion cyst of breast: A diagnostic dilemma. *Breast Dis* 35;2005:25-7.
6. Iglesias A, Arias M, Santiago P, Rodríguez M, Mañas J and Saborido C: Benign breast lesions that simulate malignancy: Magnetic resonance imaging with radiologic-pathologic correlation. *Curr Probl Diagn Radiol* 36;2011:66-82.
7. Mote DG and Shukla AA: Epidermal inclusion cyst masquerading breast lump. *Indian J Surg* 73; 2014:458-59.
8. Phukan JP, Sinha A, Pal S and Sinha R: Cytological diagnosis of epidermal inclusion cyst of breast: A rare benign lesion. *J Nat Sci Biol Med* 5;2015:460-62.
9. Kapila K and Verma K: Fine needle aspiration cytology of epidermal inclusion cysts in the male breast. *Acta Cytol* 47;2008: 315-17.
10. Kwak JY, Park HL, Kim JY, Kim EK, Chung SY, Kwon TH, Hong HS and Oh KK: Imaging findings in a case of epidermal inclusion cyst arising within the breast parenchyma. *J Clin Ultrasound* 32;2007:141-43.
11. Celik V, Unal E, Aydogan F, Sunamak O, Kuşaslan R, Rasier R, Ilvan S, Yilmaz MH and Ferahman M: Epidermal inclusion cyst of the breast: Clinical, radiologic and pathologic correlation. *Breast J* 10;2005:57-9.
12. Crystal P and Shaco-Levy R: Concentric rings within a breast mass on sonography: Lamellated keratin in an epidermal inclusion cyst. *AJR Am J Roentg.* Vol9;2009:47-S48.