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# A study of incidence of columnar cell lesions in neoplastic and non –neoplastic lesions of breast

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## ABSTRACT

**Background:** Columnar cell lesions of breast are increasingly being encountered in breast biopsies because of their associated micro calcifications which are detected on mammographic screening.Observational studies suggest the co-existence of Columnar cell lesions with more advanced lesions of breast like Ductal carcinoma in situ,Atypical ductal hyperplasia and Invasive carcinoma. The presence of Columnar cell lesionneeds careful search for other atypical breast lesionsin proximity. **Aim**: To study the occurrence of Columnar cell lesions in Neoplastic and Non-Neoplastic breast lesions and evaluate the type of lesion with respect to category of breast lesion.**Materials and methods**: This is an observational study conducted in the Department of Pathology,Gandhi hospitalfrom January 2016 to December 2017.H&E stained sections of Neoplastic and Non-Neoplastic breast lesions were reviewed and associated Columnar cell changes were evaluated.**Results**:Total200 breast lesions were studiedout of which 134 showed Columnar cell lesions. 90% cases of fibrocystic disease and 60% of fibroadenoma cases were associated with CCL and the predominant type of lesionis Columnar cell change. 80% cases of Ductal carcinoma insituand 40% of Infiltrative duct cell carcinoma cases showed CCL and the common lesion is Columnar cell hyperplasia without atypia.**Conclusion:** Columnar cell lesions were observed in both Neoplastic and Non-Neoplastic breast lesions. Based on previous observational studies cancer risk associated with CCL is only mild on long term follow up. However detection of CCL in biopsy should prompt additional scrutiny for other pathological changes.

**Key Words:** Columnar cell lesion, Micro calcifications, Neoplastic and Non-Neoplastic breast lesions, Terminal duct lobular unit

## Introduction

Columnar cell lesions (CCL) are first described in 1945 by Foote and Stewart named as Blunt duct adenosis[1], later mentioned in 1979 by Azzopardi as Clinging carcinoma[2]. Also CCL has been included in the recent WHO classification of breast (2016) under the category of Intraductal proliferative lesions.CCL is characterized by enlarged TDLUs with dilated acini lined by epithelial cells showing columnar cell morphology (Fig 1&2).

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Luminal secretions and associated calcification are common [3]. In some cases there is accompanying atypia.Columnar cells are epithelial cells which have an elongated shape with a height about 4 times the width. The cells contain uniform ovoid to elongated nuclei with inconspicuous or absent nucleoli. Apical snouts, intraluminal secretions and microcalcifications are seen.

The scheme described by Schnitt and Vincent-Salomon was used for classifying CCLs into four categories [4].They are named according to the number of layers of columnar cells present, and whether or not these cells have any atypical features. Columnar cell change (CCC) is Dilated TDLU, lined by one or two layers of columnar type epithelium. In Columnar cell hyperplasia (CCH)TDLUs are lined by more than two

stratified cell layers. In Columnar cell change with atypia and columnar cell hyperplasia with atypia, cytonuclear atypia is superimposed showing relatively round or ovoid nuclei that are not regularly oriented along the basement membrane. The nuclei are irregular, often with prominent nucleoli and show an increase in the nuclear/cytoplasmic ratio. Mitotic figures may bepresent. According to the 2003 WHO classification, CCL with atypia were mentioned as flat epithelial atypia (FEA) [5].Complex architectural patterns as seen in ADH and low grade DCIS are lacking.Intraluminal secretions and associated calcifications are responsible for their mammographic detection[3]. Breast columnar cell lesions will show microcalcifications, and they usually have a round or **pleomorphic** appearance, and a small number show branching microcalcifications.

Due to presence of CCL in proximity to invasive and non- invasive breast carcinoma observational studies suggest the co-existence of CCLwith more advanced lesions of breast like DCIS and invasive carcinoma [6, 7]. This is supported largely by the immunological and molecular evidence linking CCL to atypical hyperplasia, DCIS and IDCC[8].The presence of Columnar cell lesion needs careful search for other atypical breast lesions in proximity to gain more insight into its clinical significance.

**Materials and methods**

Present study is an observational study conducted in the Department of Pathology, Gandhi hospital for a period of 2 years from January 2016 to December 2017. Haematoxylin &Eosin stained sections of Neoplastic and Non-Neoplastic breast lesions were reviewed for the presence or absence of Columnar cell lesion .When CCL is present, the type of CCL with corresponding percentage was tabulated. The scheme described bySchnitt and Vincent-Salomon was used for classifying CCLs into following four categories. Columnar Cell Change with atypia,columnar cell change without atypia, Columnar cell hyperplasia with atypia and Columnar cell hyperplasia without atypia.

**Results**

Total 200 cases with breast lesions were studied out of which 134 cases showed Columnar cell lesions.CCC was noted in 82 cases and CCH without atypia in 52 cases. 60 cases were of Fibrocystic disease (Non-Neoplastic category) and80 were Fibroadenoma(benign category).20 cases of DCIS and 40 IDCC(malignant category) were evaluated for Columnar cell lesions. 90% cases of Fibrocystic disease, 60% of Fibro adenomas,80% cases of DCIS and 40% IDCC cases showed CCL. (**Table1**)

**Table 1: 20 cases of DCIS and 40 IDCC(malignant category) were evaluated for Columnar cell lesions. 90% cases of Fibrocystic disease, 60% of Fibro adenomas,80% cases of DCIS and 40% IDCC cases showed CCL**

| Type of breast lesion | Total no of cases | No of cases with CCL | Percentage |
|---|---|---|---|
| Fibrocystic disease | 60 | 54 | 90% |
| Fibroadenoma | 80 | 48 | 60% |
| DCIS | 20 | 16 | 80% |
| IDCC | 40 | 16 | 40% |

60 cases of Fibrocystic disease(FCD) were evaluated out of which 54 cases showed CCL. The predominant CCL is columnar cell changewhich is seen in 89% of cases.The remaining 11% of cases showed columnar cell hyperplasia without atypia.(**Table 2**)(Fig 3)

**Table 2 : Fibrocystic disease**

| Type of CCL | No of cases | Percentage |
|---|---|---|
| CCC | 48 | 89% |
| CCH without atypia | 06 | 11% |
| CCL-A | --- | --- |
| Total | 54 | 100% |

Out of 48 cases of Fibroadenoma with CCL 32 (66.7%) showed CCC whereas 16 (33.3%) cases showed CCH without atypia. (**Table 3)(Fig 4)**

**Table 3: Fibroadenoma**

| Type of CCL | No of cases | Percentage |
|---|---|---|
| CCC | 32 | 66.7% |
| CCH without atypia | 16 | 33.3% |
| CCL-A | --- | --- |
| Total | 48 | 100% |

In contrast to the type of Columnar cell lesions found in majority cases of Fibrocystic disease and Fibroadenoma the predominant CCL found in Ductal carcinoma insitu is Columnar cell hyperplasia(CCH) without atypia.87.5% cases of DCIS with CCL showed CCH without atypia. Only 12.5% cases showed Columnar cell change.(**Table 4**)(Fig 5)

**Table 4 : Ductal carcinoma in situ**

| Type of CCL | No of cases | Percentage |
|---|---|---|
| CCC | 02 | 12.5% |
| CCH without atypia | 14 | 87.5% |
| CCL-A | --- | --- |
| Total | 16 | 100% |

40% cases of Infiltrating duct cell carcinoma were associated with Columnar cell lesion. The type of CCL in all the cases is CCH without atypia.(**Table 5**)(Fig 6)

**Table 5: infiltrating duct cell carcinoma**

| **Type of CCL** | **No of cases** | **Percentage** |
|---|---|---|
| CCC | --- | --- |
| CCH without atypia | 16 | 100% |
| CCL-A | --- | --- |
| Total | 16 | 100% |

**Discussion**

Columnar cell lesions have recently become a highly controversial area in breast pathology.Over the past few years there has been an abundance of evidence linking them to atypical hyperplasia and invasive carcinomas.We conducted this observational study to gain more insight into the co-occurrence of CCL with other breast lesions. We found an incidence of CCL to be 67% in the current study, compared to study done by Seema etal[9] which showed an incidence of 37%. In a study of 100 breast biopsies performed for microcalcifications, Fraser et al[3] found CAPPS in42% cases. The term CAPPS was formerly used for lesions that are now classified as CCLs.

Our results in the study point to highest incidence (90%) of co-occurrence of CCL with FCD. The predominant CCL is Columnar cell change which is seen in 89% of cases. The remaining 11% of cases showed Columnar cell hyperplasia without atypia. Similar findings were seen in the study done by Seema et al [9]where the commonest associated lesion was Fibrocystic change which is seen in 54% of cases. In a study done byIm Choi Soo et al [10]among 1,038 FCD cases, CCLs were found in 18.9%, Columnar cell change (CCC) in 12.5%, Columnar cell hyperplasia (CCH) in 5.3% and Flat epithelial atypia (FEA) in 1.1%.In the present study also the commonest type of CCL is CCC which is in concordance with the study done by Im Choi Soo et al.

80% of DCIS cases showed CCL with majority of them showing CCH without atypia.Fraser et al [3] found that low-grade DCIS coexisted with CCLs in 56% of cases, whereas high-grade DCIS was associated with CCLs in only 19% of cases.The co-existence of CCL with invasive carcinoma was 40% with all cases showing CCH.A study done by Lakshmi Priya et al[11]Columnar cell lesions and other proliferative breast lesions were seen in 56.7% mastectomies. DCIS was the commonest lsion seen in 40% cases. FEA, CCC, CCH were seen in 26.7%, 20% and 5% of cases respectively. In a study done by Demiraley et al [12] 21 mastectomy specimens containing CCLs coexisting with IDCC were analyzed and found CCL with atypia in 33% and without atypia in 67% cases.In the present study all the cases of IDCC with CCL are associated

with CCH without atypia. Present study did indicate that risk may be increased for those having CCL with hyperplasia, although this could have been a chance finding due to the small number of cases studied.CCLs without atypia a wait and see approach are usually followed and these CCLs are therefore regarded as clinically insignificant. It has also been recommended that the identification of CCL with cytological atypia on core biopsies should lead to an open excision, because of increased risk of advanced lesions in proximity.

**Conclusion**

Based on previous studies the cancer risk associated with CCL is only mild on long term follow up.This assertion will still need substantiation by more studies with large numbers and long term follow up. It is of paramount importance that the spectrum of CCL should be recognised by practising surgical pathologists who interpret breast specimens, specifically in identifying CCL with cytological atypia, so that proper management can be instituted. Whenever CCL is diagnosed, careful search for other atypical breast lesions like DCIS,ADH and Invasive carcinoma should be made.

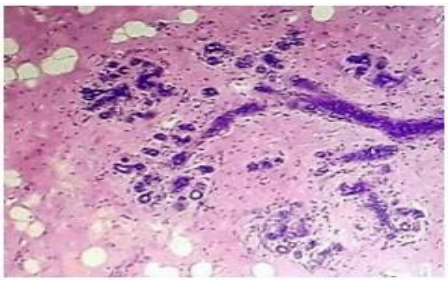

**Fig 1:TDLU**

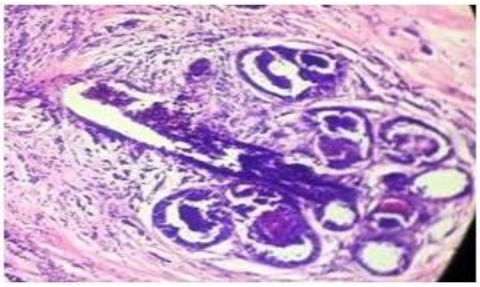

**Fig 2: CCL**

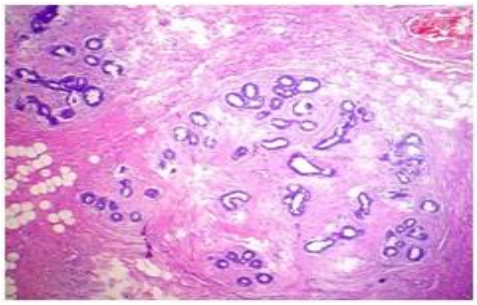

**Fig 3: FCD with CCL**

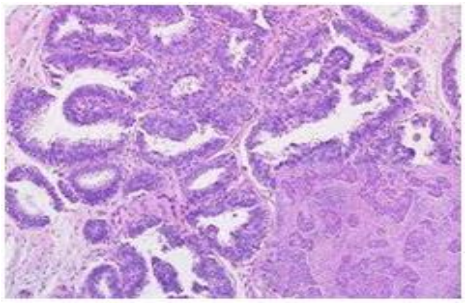

**Fig 4: Fibroadenoma with CCL**

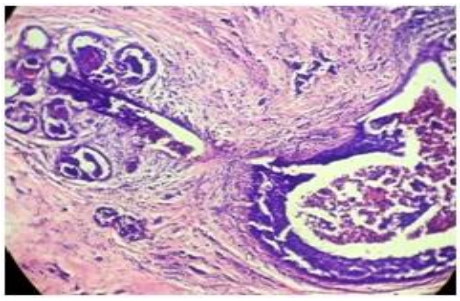

**Fig 5: DCIS with CCL**

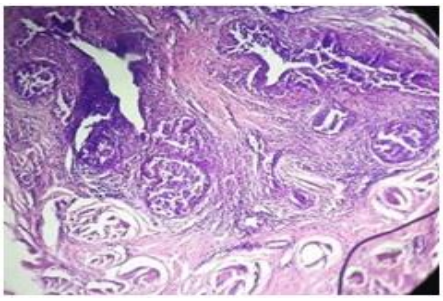

**Fig 6: IDCC with CCL**

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