

Expression of CD-10 in Phylloides Tumor and Its Correlation with Histological GradeAbinasha Mohapatra¹, Amulya Kumar Panda², Girija Sankar Naik³, Himansu Shekhar Mishra⁴¹Associate Professor, Department of General Surgery, Fakir Mohan Medical College and Hospital, Balasore, Odisha, India, 756019²Associate Professor, Department of Radiodiagnosis, VIMSAR, Burla, Sambalpur, Odisha, India, 768017³Associate Professor, Department of General Surgery, DRIEMS Institute of Health Science and Hospital, Tangi, Cuttack, Odisha, India, 754025⁴Assistant Professor, Department of General Surgery, S.C.B. Medical College and Hospital, Cuttack, Odisha, India, 753001

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Corresponding Author: Dr. Himansu Shekhar Mishra

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Abstract:

Phylloides tumor can be classified into benign, borderline and malignant on the basis of gross and microscopic appearance. However, situations arise wherein it is difficult to make distinction between the benign, borderline and malignant phylloides tumor on the basis of histology alone, hence, in these challenging scenarios immunohistochemistry (IHC) can be helpful in distinguishing the phylloides tumor and can be helpful in predicting the clinical behavior. Present study was done on 30 cases diagnosed as phylloides tumors in a tertiary care hospital and Immunohistochemistry for CD-10 was performed for further evaluation. We found significant association of CD-10 expression and histological grade of tumor. CD-10 can be used as immunohistochemical marker for diagnosis and prognosis of phylloides tumor.

Keywords: Phylloides tumor, Histological grade, Immunohistochemistry, CD-10.

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Introduction

Phylloides tumors of breast are rare fibroepithelial neoplasm of breast. Histologic criteria for diagnosing phylloides tumors as benign or malignant were first clearly defined by Norris and Taylor in 1967. [1] Currently, the WHO classifies phylloides tumor in to three categories: benign, borderline and malignant based up on the following criteria 1. Stromal overgrowth 2. Stromal cellularity 3. Nuclear pleomorphism 4. Mitotic activity 5. Microscopic tumor border (circumscribed or infiltrating). [2]

Immunohistochemistry can be helpful in differentiating the phylloides tumor and in predicting the clinical behaviour. Various immunohistochemical markers have been studied in phylloides tumor such as CD34, c-Kit, p53, Actin, Vimentin, p16, p21. [3, 4] The present study involves the expression of CD10 in benign, borderline and malignant phylloides tumor. CD10, or common acute lymphoblastic leukemia antigen (CALLA), is a cell surface zinc dependent neutral endopeptidase and is expressed by lymphoid precursor cells and some B cells. It has long been used as a marker for leukaemia, Burkitt lymphoma

and follicular lymphoma. [5] CD10 has recently been reported to be expressed in spindle cell neoplasia, and has been used to differentiate endometrial sarcoma from leiomyoma and leiomyosarcoma. In the breast, myoepithelial cells express CD10, but there are few studies of the expression of CD10 in mammary fibroepithelial lesions. Although exact role of CD10 in the tumorigenesis and malignant transformation of phylloides tumor remains unknown, it is possible that because CD10 belong to the metalloprotease family, its increased expression may facilitate the metastatic potential of higher grade lesion by providing the tumor with the capacity to invade the blood vessels.

The higher expression of CD10 in the stromal cells in the categories with an ability to metastasize (borderline and malignant phylloides tumor) could be an important observation that may have diagnostic and prognostic implications.

Material and Methods

All the patients diagnosed as phylloides tumor on histopathology were chosen for present study. The

study was done at S.C.B. Medical College & Hospital, Cuttack, Odisha from August 2023 to August 2024. History and examination findings along with radiological findings were also considered. Finally IHC for CD-10 was performed. Hematoxylin & Eosin staining procedure: Done as per Standard protocols Immunohistochemistry: Done as per Standard protocols Primary Antibody (Dako, Monoclonal Mouse Antibody, Anti-Human CD10, Product code: IS648; Ready-to-use). All the immunostained slides were assessed semi quantitatively using visual examination for both the intensity and percentage of stromal cells stained. The staining intensity was graded as negative (no staining); mild, moderate and strong, if the staining was much weaker, slightly weaker and same

intensity as that of the myoepithelium, respectively. The percentage of the stromal cells stained regardless of the intensity was graded in to less than 20%, 20-50%. And more than 50%. The tumor was considered positive for CD10, if the stromal cells had moderate to strong staining intensity in 20% or more of the stromal cells.

Results

Total 30 cases were included in the study, out of which 14 were benign, 9 were borderline and 7 were malignant on histopathological examination. (Table 1) The percentage of positivity of CD10 was significantly ($p=0.003$) higher among Malignant phylloides tumor (85.7%) than Borderline (66.7%) and Benign phylloides tumor (14.3%). (Table 2)

Table 1: Grading according to final diagnosis

Final diagnosis	No. of Cases (n=30)	Percentage (%)
Benign Phylloides Tumor	14	47
Boderline Phylloides Tumor	9	30
Malignant Phylloides Tumor	7	23

Table 2: Comparison of CD10 among the final diagnosis

CD 10	Benign PT (n=14)	Boderline PT (n=9)	Malignant PT (n=7)	p-valve #
	No. of Cases (%)	No. of Cases (%)	No. of Cases (%)	
Negative	12 (85.7%)	3 (33.3%)	1 (14.3%)	0.003*
Positive	2 (14.3%)	6 (66.7%)	6 (85.7%)	

#Chi-square test, *Significant

Discussion

There are fewer studies done evaluating CD10 expression in phylloides tumor, but all had findings similar to our study. One of the latest studies was conducted by Huzlinda Hussin et al [6] in year 2013.

They studied 61 cases of mammary phylloides tumors and found 44.7% of benign phylloides tumour, 83.3% of borderline phylloides tumour and all 100% of malignant phylloides tumor showed positive expression for CD10 immunostains and the difference was statistically significant ($p=0.001$).

Another study by Ibrahim WS [7] in year 2011 also had similar findings. 16.7%, 60 and 80% of benign, borderline and malignant phylloides tumors showed positive CD10 staining. This difference was also statistically significant. One large study in year 2005 was done by Tse GM et al [8] they studied 181 mammary phylloides tumors (102 benign, 51 borderline malignant, and 28 frankly malignant) and 33 Fibroadenoma cases using immunohistochemistry.

Their result showed that Stromal CD10 expression was positive in one of 33 fibroadenoma, six of 102 benign phylloides tumors, 16 of 51 borderline malignant phylloides tumors, and 14 of 28 frankly

malignant phylloides tumors. The difference was again significant ($p < 0.001$) statistically.

Conclusion

CD10 expression increases as lesions progress from benign to borderline and frankly malignant phylloides tumor.

Thus, CD10 immunostains may be a useful adjunct in the diagnosis and grading the phylloides tumor in histologically difficult cases.

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