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Original Research Article

TO STUDY THE STROMAL EXPRESSION OF CD10 IN BREAST CARCINOMA

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Abstract

Breast carcinoma is the commonest cancer in women. It is the leading cause of death in women, with more than one million cases occurring worldwide annually

Materials and methods: It was carried in patients with confirmed diagnosis of carcinoma breast. The study was Dept-Pathology, VTSM Peripheral Cancer Centre (Branch Of Kidwai Cancer Institute ,Bangalore

Results: Out of 6 patients among those aged less than 40 years, 4 were CD10 positive and 2 were CD10 negative. In the age group between 40-60 years, out of 53 patients

Conclusion: The stromal expression of CD10 has significant correlation with higher histological grade (Grade 3), ER negativity, PR negativity and HER2neu positivity and triple negativity

Keywords: Breast, Carcinoma, CD 10

Introduction

Seldom has a disease evoked more interest and dreadful fear in the common man like it has for cancer. Breast cancer amongst all cancers, continue to evoke such responses and even more research, especially since the treatment involves surgery which leaves physical and emotional scars in its victims.Breast carcinoma is the commonest cancer in women. It is the leading cause of death in women, with more than one million cases occuring worldwide annually(1).

Breast cancer represents an important public health issue, having a high occurence worldwide, with an obvious increasing tendency (2).The Edwin Smith Surgical Papyrus is having the first reference to breast cancer. This surgical text, described in hieratic script, is the

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incomplete copy of an original record that dates back to the pyramid age of Egypt (3000-2500BC) (3).The incidence of cancer has been on rise worldwide. Breast cancer incidence accounts for 16% of all breast cancers, as per the WHO cancer control and prevention program. It is calculated that 519 women died owing to breast malignancy in 2004 (4). Inspite of the fact, breast cancer is thought to be a disease of the developed world, majority of breast cancer mortality (69%), is in developing countries (4). Hence breast cancer has emerged to be one of the leading cancer killers amongst women worldwide.

Over the last few decades there have been better advances in breast cancer. Early detection and skillfull treatment has lead to a significant decline in breast cancer deaths. It has also made improved outcome for women living with the disease. Breast cancer is no longer seen as single disease but rather a multifaceted disease consisting of diverse biological subtypes with distinct natural history.

Breast cancer presents as a varied spectrum of clinical, pathological and molecular features with diverse prognostic and therapeutic implications.Estrogen is the steroid hormone, responsible for development and maturation of primary and secondary sexual characteristics in females (5).

Estrogen has an important role in pathogenesis and development of breast cancer (6).Estrogen receptor is an intracellular protein molecule. They are targets for estrogen action. Estrogen receptor normally resides in cell nucleus, along with DNA molecules. Estrogen receptor alpha gene polymorphism leads to alteration in estrogen receptor function in breast cancer (7).

MATERIALS AND METHODS

It was carried in patients with confirmed diagnosis of carcinoma breast. The study was Dept-Pathology, VTSM Peripheral Cancer Centre (Branch Of Kidwai Cancer Institute ,Bangalore. The study sample comprised of 75 breast cancer patients. Cases were chosen from Department of General surgery.

Age of the patient and histological grading was obtained for all cases. 75 patients were screened for receptor status of estrogen and progesterone as well as HER2neu and CD10 through immunohistochemical assay.

INCLUSION CRITERIA:

Patients with Infiltrating ductal carcinoma, NOS and its variants

EXCLUSION CRITERIA:

Patients with fibroadenoma, phyllodes tumor and other benign neoplasms.

OBSERVATION AND RESULTS

In this study, we included 75 patients diagnosed with infiltrating ductal carcinoma fulfilling the inclusion and exclusion criteria.

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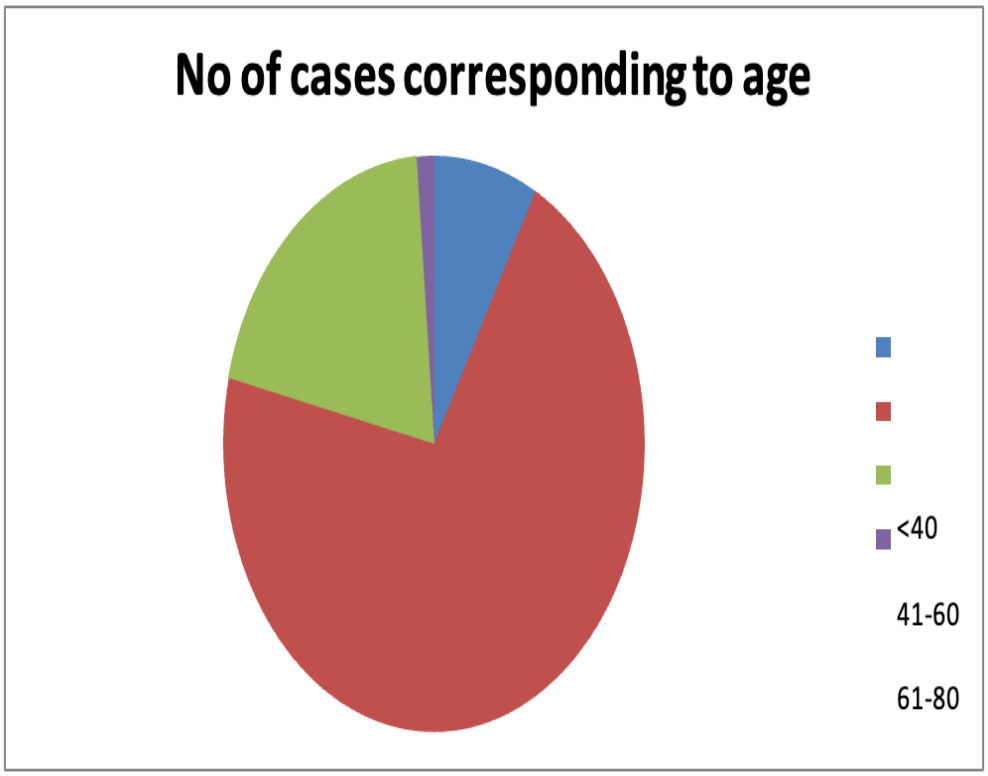
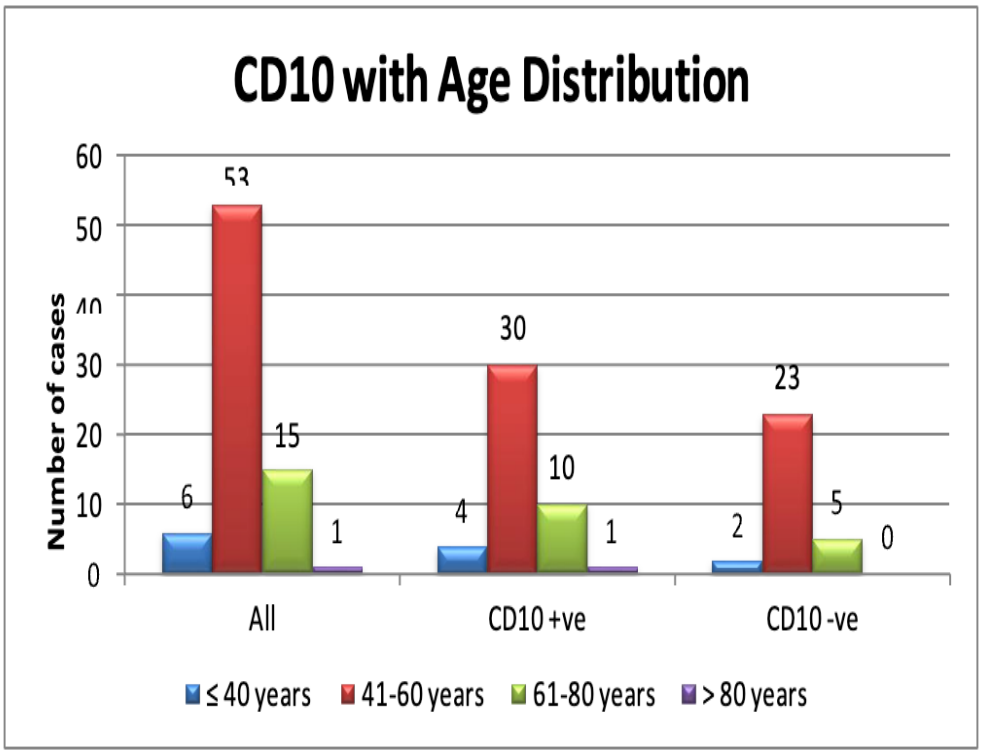
1. Age



Graph 1: Age wise distribution of number of cases



Graph 2: Comparison of CD10 with age (All- No of cases)

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Table 1: Age wise distribution of cases compared with CD10

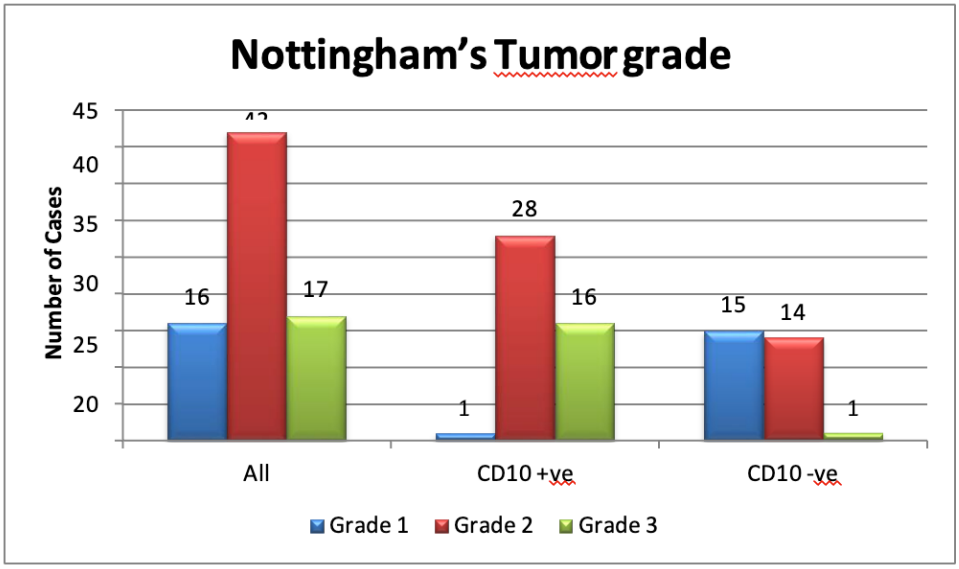
Age Distribution	No. of cases	%	CD10 +ve	%	CD10 - ve	%
≤ 40 years	6	8.00	4	8.89	2	6.67
41-60 years	53	70.67	30	66.67	23	76.67
61-80 years	15	20.00	10	22.22	5	16.67
> 80 years	1	1.33	1	2.22	0	0.00
Total	75	100	45	100	30	100

Table 2: P value for CD10 comparison with age

Age Distribution	Number of cases	CD10 +ve	CD10 –ve
N	75	45	30
Mean	53.79	55.22	51.63
SD	10.64	11.47	9.00
P value Unpaired t Test			0.134671

Out of 6 patients among those aged less than 40 years, 4 were CD10 positive and 2 were CD10 negative. In the age group between 40-60 years, out of 53 patients, 30 were CD10 positive and 23 were CD10 negative. In the age group of 61-80 years, out of 15 patients, 10 were CD10 positive and 5 were CD10 negative. In the age group of more than 80 years, 1 patient was included in the study and was CD10 positive.

Tumor grade



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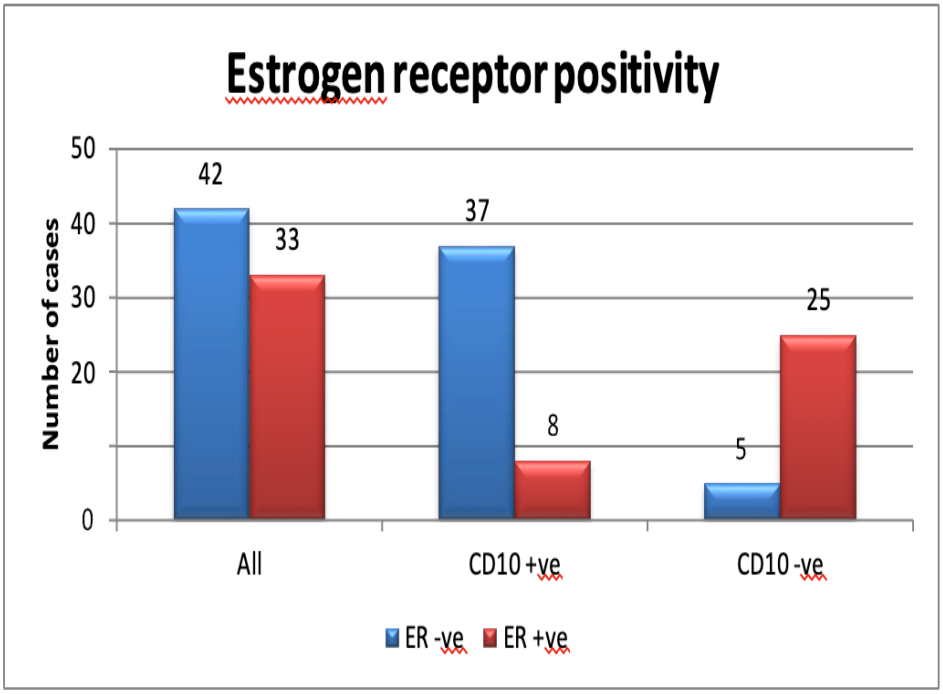
Graph 3: Comparison of CD10 with histological grading (All- No of cases)

Table 3: P value for CD10 comparison with tumor grading

Nottingham's Tumor Grade	Number of cases	%	CD10 +ve	%	CD10 - ve	%
Grade 1	16	21.33	1	2.22	15	50.00
Grade 2	42	56.00	28	62.22	14	46.67
Grade 3	17	22.67	16	35.56	1	3.33
Total	75	100	45	100	30	100
P value Fishers Exact Test					< 0.0001	

Out of 16 patients with histological grade, 1 was CD10 positive, 15 were CD10 negative. Out of 42 patients with histological grade 2, 28 were CD10 positive and 14 were CD10 negative. Out of 17 patients with grade 3, 16 were CD10 positive and 1 was CD negative. The correlation was statistically significant (p value <0.0001)

Estrogen receptor positivity



Graph 4: Comparison of CD10 with ER status

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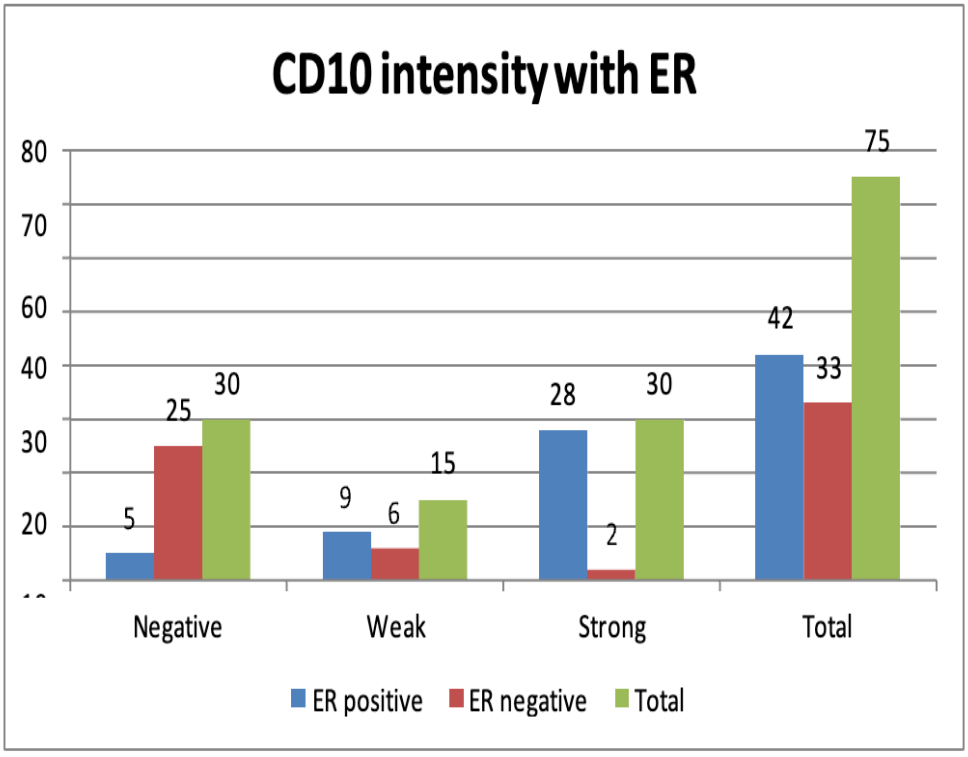
Table 4: P value for CD10 comparison with ER status

Estrogen Receptor Positivity	Number of cases	%	CD10 +ve	%	CD10 - ve	%
ER -ve	42	56.00	37	82.22	5	16.67
ER +ve	33	44.00	8	17.78	25	83.33
Total	75	100	45	100	30	100
P value Fishers Exact Test					< 0.0001	
Sensitivity					24.2	
Specificity					11.9	
PPV					17.8	
NPV					16.7	



Graph 5: Comparison of CD10 intensity with ER

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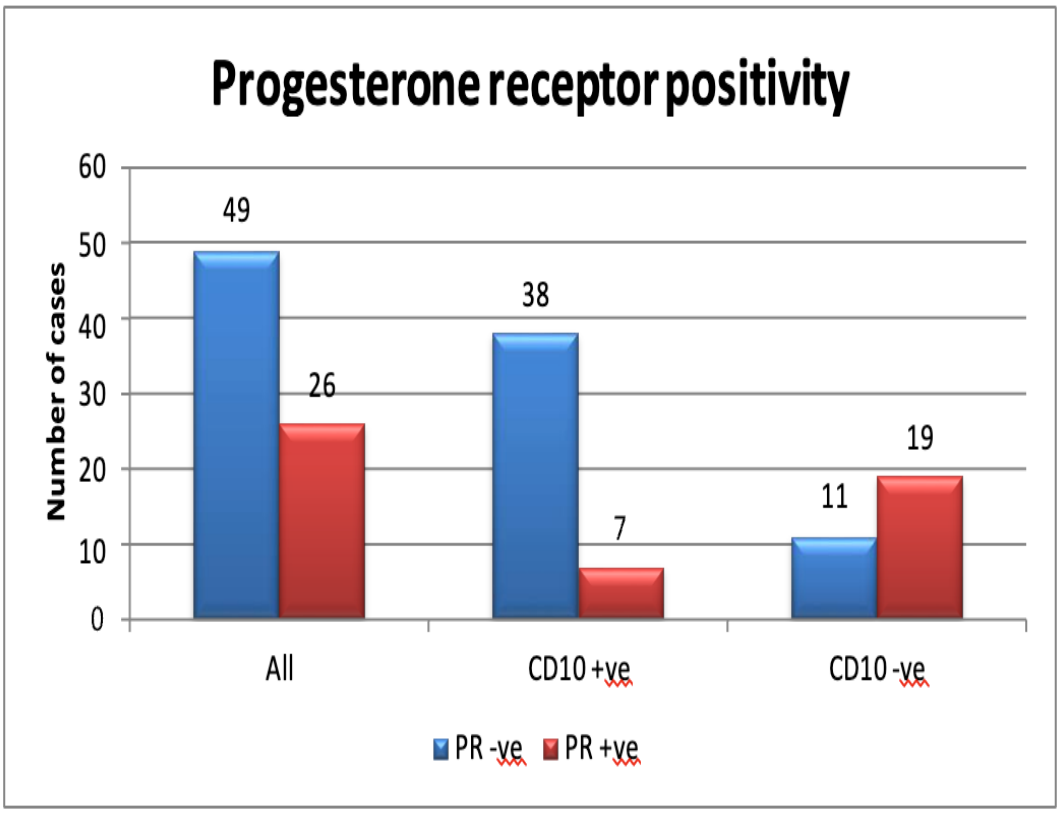
Table 5: Comparison of CD10 intensity with ER

CD10	ER negative	ER positive	Total
Negative	5	25	30
Weak	9	6	15
Strong	28	2	30
Total	42	33	75

Out of 75 cases of breast carcinoma, 42 were ER negative and 33 were CD10 positive. Out of 42 ER negative cases, 37 were CD10 positive (9 were weakly stained and 33 had strong staining) and 5 were CD10 negative. Out of 33 ER positive cases, 8 were CD10 positive (6 were weakly stained and 2 had strong staining) and 25 were CD10 negative. The correlation was statistically significant (p value<0.0001)

Progesterone receptor positivity



Graph 6: Comparison of CD10 with PR status

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Table : P value for Comparison of CD10 with PR status

Progesterone Receptor Positivity	Number of cases	%	CD10 +ve	%	CD10 - ve	%
PR -ve	49	65.33	38	84.44	11	36.67
PR +ve	26	34.67	7	15.56	19	63.33
Total	75	100	45	100	30	100
P value Fishers Exact Test					< 0.0001	
Sensitivity					26.9	
Specificity					22.4	
PPV					15.6	
NPV					36.7	

DISCUSSION

The age group of patients included in our study varied from less than 40 to more than 80 years with most of the patients belonging to 41-60 years. Mean age was 54 years . Sayantan et al in the year 2014 conducted a study which included patients with age less than 40 to more than 60 years (8).A study conducted by Vandana puri et al in the year 2011 included patients from 30 to 80 years with a mean age of 48.5 years (9).In the year 2013, a study conducted Thomas S Babu RJ et al included patients from 34 to 55 years with a mean age of 45 years (10)**.**In this present study, 53 out of 75 patients (70.67%) belonged to age group 41-60 years . Out of 53 patients, 30 were CD10 positive and 23 were CD10 negative. Number of positive cases increased as the age advances but as overall when comparing patients of all age groups, comparison with CD10 positivity was not statistically significant (P value – 0.134671). Sayantan H Jana et al in the year 2014 observed in his study that comparison of age with CD10 positivity was not statistically significant (P value- 0.3572) (8).In the year 2014, a study done by Ali Taghizadeh-Kermani et al,67 out of 100 cases of invasive carcinoma belonged to age group 41-60 years and comparison of age with CD10 positivity was not statistically significant (P value-0.21) (11)

Name of study	Age group	CD10 Positivity	P value
Present study	41-60 years	30 out of 53	0.134671
Sayantan H Jana et al	40-60 years	19 out of 45	0.3572
Ali Taghizadeh- kermani et al	41-60 years	44 out of 67	0.21

In the present study, out of 75 cases, 16 (21.33%) cases belonged to grade 1, 42 (56%) cases belonged to grade 2 and 17 (22.67%) cases belonged to grade 3. Out of 17 grade 3 cases, 16 (35.56%)wereCD10 positive. The comparison between grade and CD10 was statistically significant (<0.0001) .In the year 2014, a study was conducted by Sayantan et al. It was observed that CD10 comparison was statistically significant (P value- 0.0413). Out of 22 cases which belonged to grade 3, 13 were CD10 positive (8).Ali Teghizadeh Kermani et al in the year 2014 observed in his study that comparison

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of CD10 positivity with higher histological grade (Grade 3) was statistically significant (P value<0.001). Out of 28 cases belonging to grade 3, 26 were CD10 positive out of which 15 were strongly stained (11).A study conducted by Vandana Puri et al in the year 2011 in which most of the patients (26/49- 53.06%) belonged to grade 3 (9).In the year 2007, a study was done by Nikita A Makretsov et al in which 68 patients belonged to grade 3 (26.4%) out of which 62 were CD10 positive and comparison with CD10 was statistically significant (P value- 0.02) (12).In the year 2015 in a study conducted by Maha E. Salama et al,7 cases were CD10 positive out of which 5 (45.5%) were strongly positive and 2 (18.2%) were weakly positive (13) Keiichi Iwaya et al did a study in the year 2002 in which 22 patients belonged to grade 3 out of which only 3 cases were CD10 positive. Comparison with CD10 was not statistically significant (P value- 0.488) (14)

CONCLUSION

The stromal expression of CD10 has significant correlation with higher histological grade (Grade 3), ER negativity, PR negativity and HER2neu positivity and triple negativity.There is no correlation between CD10 expression.

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