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STUDY OF P63, A MYOEPITHELIAL MARKER OF BREAST, IN DIFFERENTIATING BENIGN AND MALIGNANT LESIONS.

Pathology

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ABSTRACT

Introduction : p63, an homologue of p53 gene is a nuclear marker of myoepithelial cells. It is a nuclear protein is involved in cellular differentiation and development. Immunohistochemical staining of p63 is of great diagnostic value in differentiating benign and malignant lesions of breast. **Aim And Objectives:** To study the staining pattern of p63 and its usefulness, sensitivity and specificity in differentiating benign and malignant lesions of breast. **Materials And Methods:** This study was conducted in department of Pathology, tertiary health care hospital, in Kancheepuram district, Tamilnadu. Institutional ethical committee clearance was obtained . 22 benign and 8 malignant lumps were studied. Immunohisto chemical staining for p63 was done in all the biopsies along with hematoxylin and eosin staining. **Results And Observation:** We observed that p63 Staining of myoepithelial cells as a continuous layer in all the benign cases. Discontinuous layer of staining in Ductal carcinoma in situ and proliferative breast lesions. Malignant lumps are devoid of any staining. **Conclusion:** p63 is a very useful marker identifying myoepithelial cells and in differentiating benign, in situ and malignant lesions of breast and helps in solving diagnostic difficulties. P63 should be included in the immunohistochemical panel in such challenging cases.

KEYWORDS

p63 Myoepithelial Marker, Breast Lesions, Immunohistochemistry, Malignant Lesions.

INTRODUCTION :

Breast lumps are common disease of females. Benign lumps are common in younger age whereas malignant lumps are commonly seen in elderly age group. p63, an homologue of p53 gene is a nuclear marker of myoepithelial cells[1]. It is a nuclear protein is involved in cellular differentiation and development. It is of great diagnostic value in differentiating benign and malignant lesions of breast of similar morphology[2]. It is helpful in giving accurate diagnosis in small core biopsies and in cytology.

AIM AND OBJECTIVES:

To study the staining pattern of p63 and its usefulness, sensitivity and specificity in differentiating benign and malignant lesions of breast.

MATERIALS AND METHODS:

This study was conducted in Department of Pathology, tertiary health care hospital, in Kancheepuram district, Tamilnadu. Institutional ethical committee clearance was obtained. 22 benign and 8 malignant lumps were studied. Formalin fixed and paraffin embedded breast tissues were sampled. Slides were stained with Hematoxyllin and eosin staining. Immunohisto chemical staining for p63 was done in all the cases. Myoepithelial cells can be seen with H &E stain also. Tissue processing was done in pathology department. Tissue bits were fixed in 10% formalin. Dehydrated in ascending grades of alcohol, cleared in xylene and embedded in paraffin wax. Immune histochemical staining method for p63:

2-5 micrometer thin sections were cut and was placed on poly L lysine coated slides. Sections were incubated, de paraffinised and rehydrated through graded alcohols followed by distilled water. Section were placed in citrate buffer for antigen retrieval in pressure cooker for 20 minutes. Endogenous peroxide activity was blocked with 3% hydrogen peroxide and treated with protein blocking antibody. After washing with TBS buffer, p63 immuno staining was performed with monoclonal mouse anti human p63 antibody for 1 hour.(Dako Denmark A/S, Glostrup, Denmark). The secondary antibody was applied for 30 minutes. Followed by diamino benzidene solution for 45 minutes. Finally sections were counter stained with hematoxylin stain. Positive and negative controls were also stained and compared with our tissue slides.

RESULTS AND OBSERVATION:

We observed that p63 Staining of myoepithelial cells as a continuous layer in all the benign cases [figure 1] . Discontinuous layer of staining in proliferative breast lesions and DCIS areas [figure 2]. Malignant cell groups are devoid of any staining [figure 3].

Sensitivity and specificity of the p63 marker is found to be above 90% . Identification of myoepithelial cells also helped in differentiating benign papilloma and papillary carcinoma. It is very valuable in repoting small core biopsies and also in cytology. P63 marker stains the nuclei of the myoepithelial cells. Slides were studied thoroughly under microscope. Our findings were recorded (Table 1).

Table 1: Staining pattern of p63 in breast lumps

S.no	Breast lumps	P63 staining pattern
1.	Benign breast lumps	Continuous positivity
2.	Proliferative breast disease and DCIS	Discontinuous positivity
3.	Malignant breast lumps	No positivity /negative

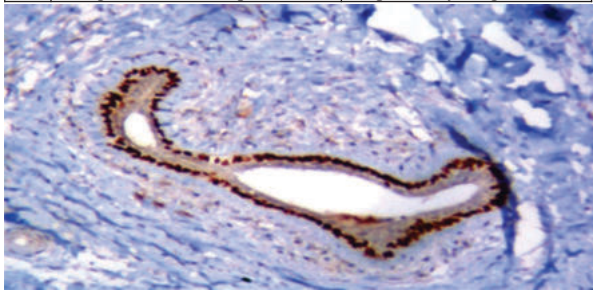

Figure 1: p63 Staining of myoepithelial cells as a continuous layer around the ducts.(40x)

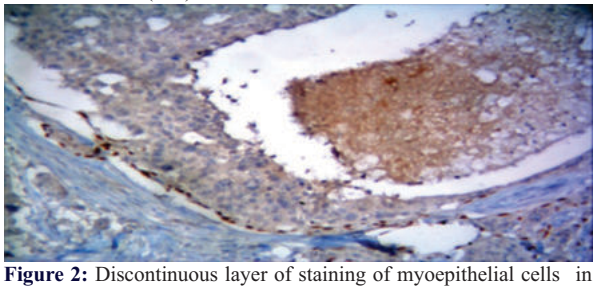

Figure 2: Discontinuous layer of staining of myoepithelial cells in DCIS areas (40x)

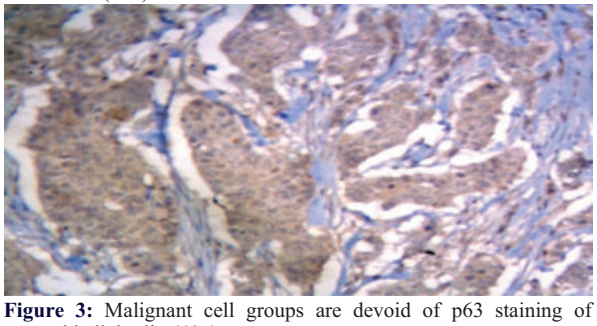

Figure 3: Malignant cell groups are devoid of p63 staining of myoepithelial cells (40x)

DISCUSSION:

Myoepithelial Cells form the basal layer of mammary epithelium[1]. Many immuno histochemical markers are available namely, smooth muscle actin, smooth muscle myosin heavy chain, calponin , cytokeratin 14, cytokeratin 5/6, CD10, h - caldesmon and p63[3]. Smooth muscle actin is used widely and it is a sensitive and specific marker too. p63, a nuclear protein is a member of p53 gene family[1]. p63 is involved in cellular differentiation and development. Many studies reports that most of the myoepithelial markers show cross reaction with stromal fibroblasts and vascular smooth muscle. P63 stains only the myoepithelial cells and very rarely epithelial cells and does not react with stromal cells[4]. It is highly specific[4]. We also observed the similar findings in our study.

Human breast contains a branching ductal network terminating in lobular units commonly referred to as terminal duct lobular unit(TDLU). The ducts are lined by inner layer of polarized luminal epithelial cells and an outer layer of myoepithelial cells which in turn surrounded by a basement membrane. myoepithelial cells serves to maintain tissue integrity by maintaining tissue polarity. They are spindle shaped and parallel to long axis of the ducts. In TDLU, myoepithelial cells are stellate shaped forming a basket like covering around epithelial cells allowing them to contact basement membrane at some places.

p63 is consistently expressed by basal/somatic stem cells stratified epithelia, myoepithelial cells of breast and salivary glands and basal cells of prostatic acini. p63 stains the naked nuclei in breast cytology[7],[8]. p63 helps in diagnosing some difficult challenging benign lesions of breast like sclerosing adenosis, radial scars and papillary lesions[3],[8]. Koker et al reports that p63 as a highly specific marker for metaplastic carcinoma and helps in differenting it from sarcoma[5].

Our study findings were similar to Verma N et al study of 2018 [10]. p 63 could serve as a specific marker for identification of myo epithelial cells and CK5/6 is of value in differentiating ductal proliferation of varying degrees and in differentiation between invasive and non invasive lumps[6]. Using a immuno histochemical (IHC) panel of p63, CK5/6, alpha –SMA helps in increasing diagnostic accuracy of breast diseases[9],[10]

CONCLUSION:

p63 is a reliable, sensitive, highly specific marker of myoepithelial cells. It can be included in the immunohistochemical panel used to differentiate benign and malignant lesions in both histopathology and cytology especially in assessing difficult cases.

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