Original Research Article **Pathology**

International Journal of Pharma and Bio Sciences

ISSN
0975-6299

ROLE OF PROSTATIC BASAL CELL MARKER IN DIAGNOSIS OF PROSTATIC LESIONS

SUBATHRA K*

Department of pathology, Government Theni Medical College, Theni, Tamilnadu, India.

ABSTRACT

Prostatic biopsy interpretation and differentiating between premalignant and malignant lesions is a problem for practicing pathologist in many cases especially in TURP cases. An important diagnostic criterion in the differentiation is the loss of basal cell layer in adenocarcinoma and its presence in the benign lesions. This study aims at the evaluation of role of basal cell immunohisto chemical markers in different benign, premalignant and malignant lesions of prostate. From one hundred and eight transurethral resection of prostate specimens ten cases selected and immunohistochemical study with p63 was done. Continuous staining of basal cells was observed in benign glands, foci of low grade PIN and atypical adenoamatous hyperplasia. Focal discontinuity in basal cell staining was observed in high grade PIN areas. Complete absence of basal cell staining was seen in adenocarcinoma. Discontinuous basal cell staining was seen in disrupted glands of Granulomatous prostatitis. In this study malignant glands consistently failed to express immunoreactivity to antibody against p63, whereas normal prostatic acini invariably were stained for basal cells. Increasing grades of PIN were associated with progressive disruption of basal cell layer. In our study suspected areas of atypical adenomatous hyperplasia in benign prostatic hyperplasia showed continuous staining with p63 which proved that the lesion was benign. With Immunohistochemical staining invasiveness increased from benign (continuous staining) to malignant (absence of staining) end in the spectrum of prostatic lesions.Basal cell markers play significant role in the diagnosis of prostatic lesions especially which fall in the premalignant category and which create difficulty in the diagnosis by routine histopathological study.

KEYWORDS: ***Benign prostatic hyperplasia, prostatic adenocarcinoma, p63, granulomatous prostatitis, High grade PIN***

SUBATHRA K*

**Department of pathology, Government Theni Medical College,
Theni, Tamilnadu, India.**

Received on: 23-08-2017
Revised and Accepted on: 05-10-2017
DOI: http://dx.doi.org/10.22376/ijpbs.2017.8.4.b427-431

INTRODUCTION

Prostatic lesions on routine haematoxylin & eosin staining sometimes cause diagnostic difficulties between premalignant and malignant lesions[1] like atypical adenomatous hyperplasia (AAH) and prostatic intraepithelial neoplasia (PIN). An important diagnostic criterion in the differentiation is the loss of basal cell layer in adenocarcinoma and its presence in the benign lesions. Several immunohistochemical markers have been used to stain the basal cells of prostate like High molecular weight cytokeratin (HMWCK), p63 etc. In 1953, Totten et al[2] observed that basal cells were invariably lacking in prostatic adenocarcinoma. In 1985, Brawer et al[3] clearly outlined the manner in which staining for high molecular weight cytokeratin could be used to distinguish a variety of benign and potentially preneoplastic processes from invasive carcinoma. The recently cloned gene, p63, is a homologue of the tumor suppressor gene, p53. 68, 82, 86, 93.P63 is marker for basal epithelial cells and it is required for normal development of several epithelial tissues, including the bladder and prostate glands[4]. P63 inhibits cell migration and its expression is lost in human prostate cancer metastasis.[5] The advantages of p63 over High molecular weight cytokeratin in prostate immunohistochemistry are[6] 1) Stains a subset of 34βE12 negative basal cells. 2) Less susceptible to the staining variability than 34βE12 (particularly in TURP specimens with cautery artifact). 3) Easier to interpret because of its strong nuclear staining intensity and low background. In a study by Weinstein MH false-negative staining for p63 was less compared with the case of high molecular weight cytokeratin. This current study aims at the evaluation of role of basal cell markers in different benign, premalignant and malignant lesions of prostate.

METHODS

Immunohistochemical study with prostatic basal cell marker p63 was done for various types of prostatic lesions. Ten such selected cases include Granulomatous prostatitis, Benign Prostatic Hyperplasia, atypical adenomatous hyperplasia, low grade PIN, high grade PIN, and adenocarcinoma. Expression of p63 was considered as nuclear positivity of the basal cells of prostatic epithelium.

Observations

The following cases were selected for immunohistochemical staining with prostatic basal cell marker p63. Continuous staining of basal cells was observed in benign glands, foci of low grade PIN and atypical adenoamatous hyperplasia. (Figure 1,2) Focal discontinuity in basal cell staining was observed in high grade PIN areas. (Figure 3) Complete absence of basal cell staining was seen in adenocarcinoma. (Figure 4,5) Interestingly discontinuous basal cell staining was seen in disrupted glands of Granulomatous prostatitis. (Figure 6)

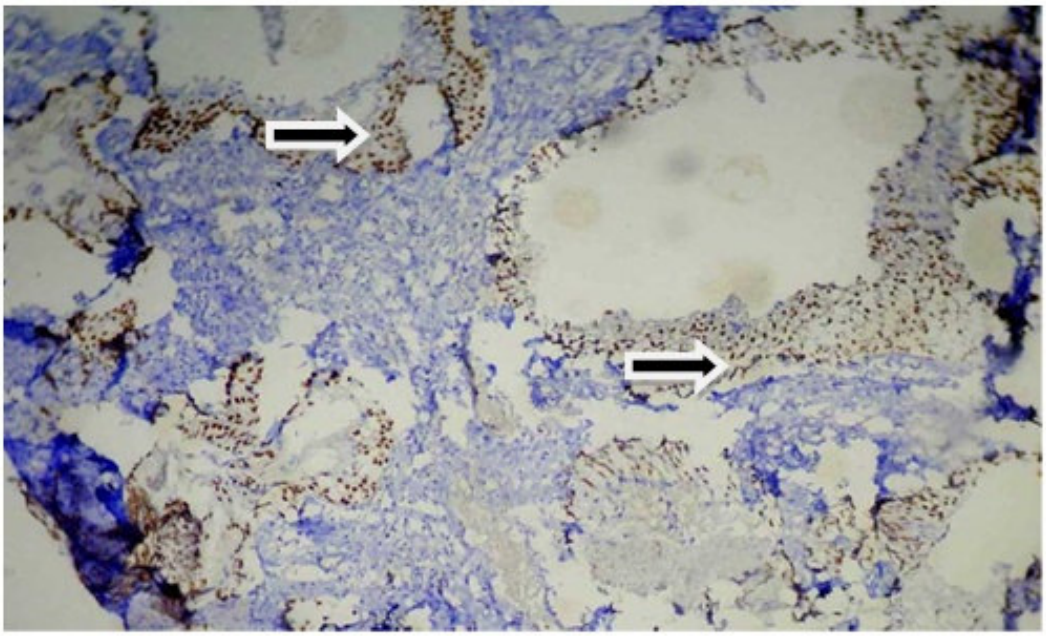


Figure 1
Foci of low grade PIN showing continuous basal cell immunostaining with p63.

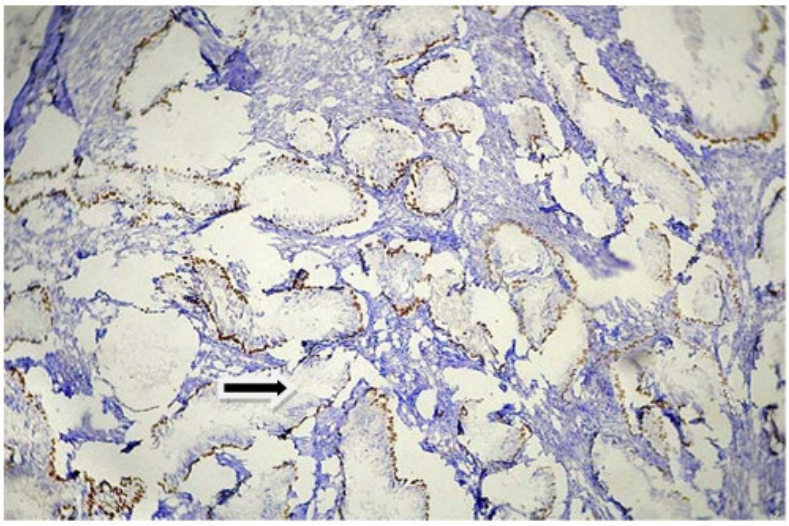


Figure 2
Foci of Atypical Adenomatous Hyperplasia showing continuous basal cell immunostaining with p63. (100X)

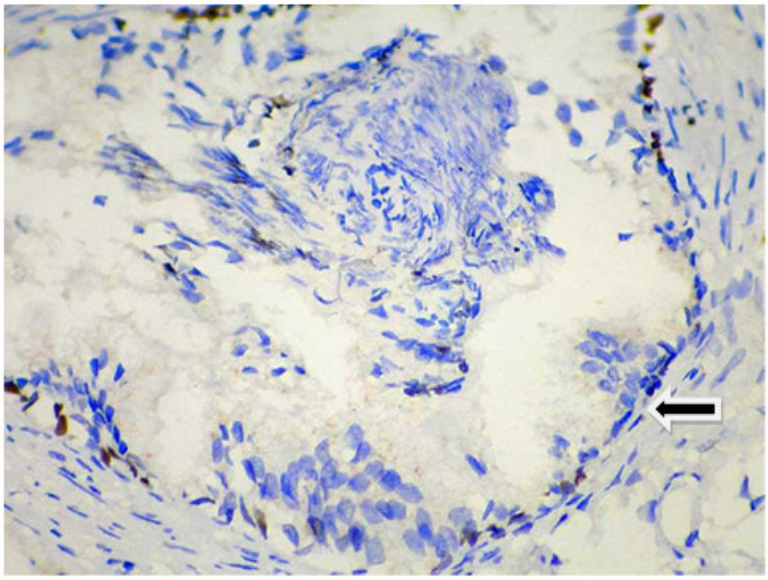


Figure 3
Foci of high grade PIN showing discontinuous basal cell immunostaining with p63. (400X)

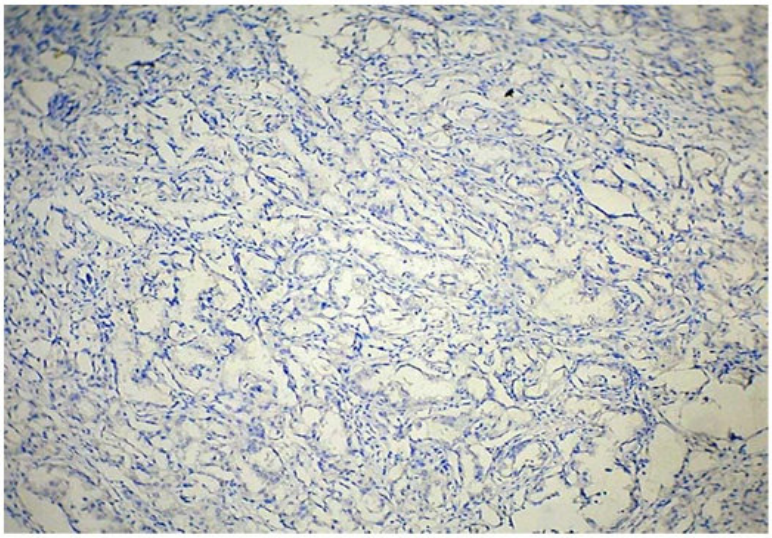


Figure 4
Prostatic adenocarcinoma showing absent basal cell immunostaining with p63. (100X)

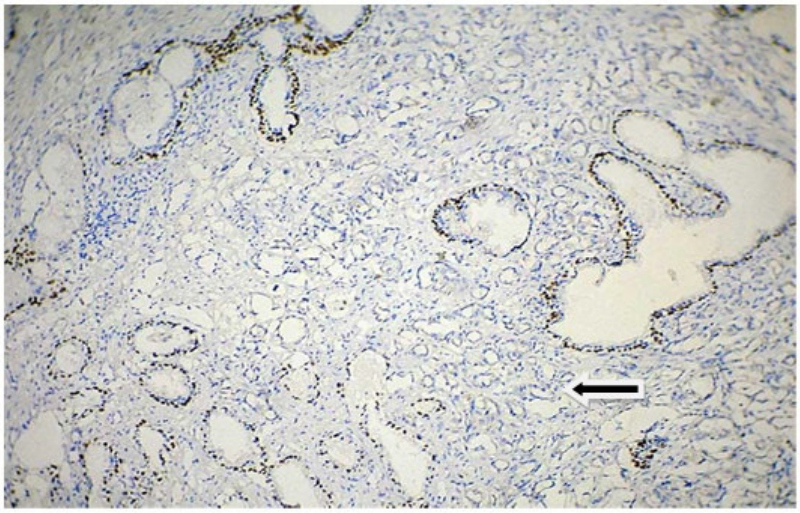


Figure 5
Grade 3 prostatic adenocarcinoma showing infiltrating malignant glands between benign glands with p63 immunostaining. (100X)

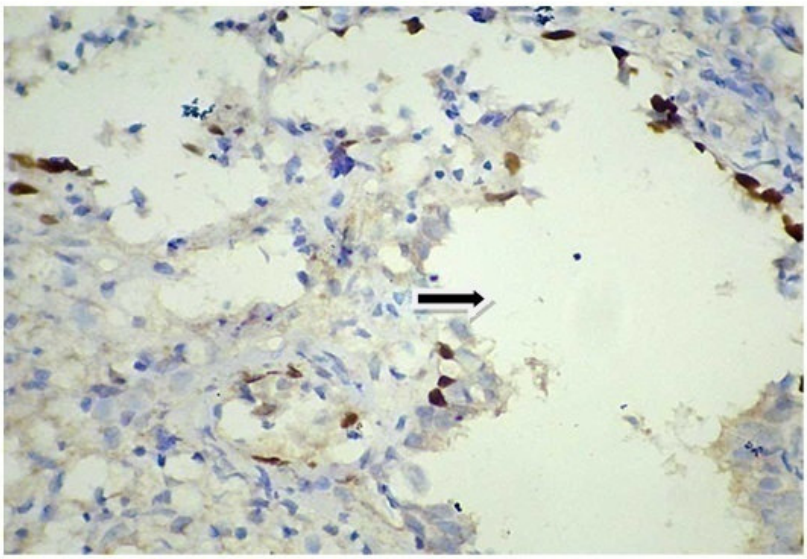


Figure 6
Granulomatous prostatitis showing discontinuous basal cell immunostaining with p63 in centre of granuloma. (100X) (21/10)

DISCUSSION

P63 is most abundantly represented in normal prostate basal cells and it is a reliable prostate basal cell marker. Because basal cells with p63 protein are consistently undetectable in prostate cancers, p63 expression may be used in the differential diagnosis between benign and malignant lesions of the prostate. This marker has the disadvantage that a diagnosis of cancer is based on negative staining. Benign conditions like atrophic glands (25%), basal cell hyperplasia (12%) and atypical adenomatous hyperplasia (10-90%) may show negative staining with basal cell markers. So it is critical to study the immunostained sections with a positive internal control. Benign glands with a strong positive signal were taken as controls. A combination of basal cell markers and α-methylacyl-CoA racemase (AMACR), has increased the sensitivity for the diagnosis of prostate cancer rather than basal cell markers.[7] A rare group of prostatic adenocarcinomas that aberrantly express p63 and have demonstrated that they likely represent a molecularly distinct subclass of prostatic adenocarcinoma.[8] AMACR positivity will be helpful in diagnosing this rare entity of tumors.[9] Granulomatous prostatits is a distinctive form of prostatits that can be misdiagnosed as carcinoma clinically,[10-12] radiologically,[13-14] and histopathologically.[15] Interestingly in our study the glands in the centre of the granuloma showed absence of basal cells. This shows that while interpreting basal cell marker immunostaining, attention should be given to surrounding inflammation also. This is the disadvantage of using basal cell marker alone as a diagnostic tool. Increasing grades of PIN were associated with progressive disruption of basal cell layer.[16] In this study basal cell layer disruption was seen in foci of high grade PIN areas. In our study suspected areas of atypical adenomatous hyperplasia in benign prostatic hyperplasia showed continuous staining with p63 which proved that the lesion was benign. As definite diagnosis was arrived with p63 in this case AMACR was not done. So p63 staining is useful in diagnosing gray zone cases. In this study malignant glands consistently

failed to express immunoreactivity to antibody against p63, whereas normal prostatic acini invariably were stained for basal cells.

CONCLUSION

With Immunohistochemical staining invasiveness increased from benign (continuous staining) to malignant (absence of staining) end in the spectrum of prostatic lesions.Because basal cells with p63 protein are consistently undetectable in prostate cancers, p63 expression may be used in the differential diagnosis between benign and malignant lesions of the prostate.

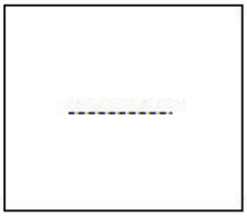
CONFLICT OF INTEREST

Conflict of interest declared none.

REFERENCES

1. K.Subathra,N.Sangeetha. Histopathological study of prostatic lesions and assessementwith agnor index. Int J Pharm Bio Sci 2014April ; 5(2):(B)253-60.
2. Totten RS, Heinemann NW, Hudson PB, Sproul EE, Stout AP. Microscopic differential diagnosis of latent carcinoma of the prostate. Arch Pathol Lab Med 1953; 55: 131–41.
3. Brawer KB, Peehl DM, Stamey TA, Bostwick DG. Keratin immunoreactivity in the benign and neoplastic human prostate. Cancer Res 1985; 45: 3663–667.
4. Pignon JC, Grisanzio C, Geng Y, Song J, Shivdasani RA, Signoretti S. p63-expressing cells are the stem cells of developing prostate, bladder, and colorectal epithelia. ProcNatlAcadSci U S A. 2013;110(20):8105–110.
5. Tucci P, M Agostini, F Grespi. Loss of p63 and its microRNA-205 target results in enhanced cell migration and metastasis in prostate cancer. Proc. Natl. Acad. Sci. USA. 2012;109:15312–15317.
6. World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of the Urinary System and Male Genital Organs: Edited by John N. Eble, Guido Sauter, Jonathan I. Epstein, Isabell A. Sesterhenn. IARCPress, Lyon.
7. Lars Egevad, William C. AllsbrookJr, Jonathan I. Epstein: current practise of diagnosis and reporting of prostate cancer on needle biopsy among genitourinary pathologists. Hum Pathol (2006) 37, 292-97.
8. Tan HL, Haffner MC, Esopi DM, et al. Prostate adenocarcinomas aberrantly expressing p63 are molecularly distinct from usual-type prostatic adenocarcinomas. Mod Pathol 2015;28:446-56.
9. The pathology of unusual subtypes of prostate cancer. Jing Li, ZheWang,Chin J Cancer Res. 2016 Feb; 28(1): 130–143.
10. Kelalis PP, Greene LF, Harrison EG Jr. Granulomatous prostatitis. A mimic of carcinoma of prostate. JAMA 1965; 191: 287-89.
11. Taylor EW, Whelis RF, Corea RJ Jr, et al. Granulomatous prostatitis: Confusion clinically with carcinoma of prostate. J Urol 1997; 117: 316-18.
12. Thompson GJ, Albers DO, Granulomatous prostatitis: condition which clinically may be confused with carcinoma of prostate. . J Urol 1953; 69: 530-38.
13. BudeR,Bree RL, Adler RS, et al. Transrectal ultrasound appearance of granulomatous prostatits. J Ultrasound Med 1990; 9:677-80.
14. Rubenstein JB, Swayne LC, Magidson JG, et al. Granulomatous prostatitis: A hypoechoic lesion of the prostate. UrolRadiol 1991; 13: 119-22.
15. Presti B, Weidner N, Granulomatous prostatitis and poorly differentiated prostatic carcinoma. Their distinction with the use of immunohistochemical methods. Am J ClinPathol 1991; 95: 330-334.
16. Bostwick DG, Brawer MK: Prostatic intraepithelial neoplasia and early invasion. Cancer 1987; 59:788-94.

Reviewers of this article



S. Malliga MBBS., MD

Professor,
Dept. of Pathology,
Govt. Sivagangai Medical College,
Sivaganagi, Tamilnadu, India.

Prof. Y. Prapurna Chandra Rao

Assistant Proffessor, KLE University,
Belgaum, Karnataka, India

Prof.Dr.K.Suriaprabha

Asst. Editor , International Journal of Pharma and Bio sciences.

Prof.P.Muthuprasanna

Managing Editor , International Journal of Pharma and Bio sciences.

We sincerely thank the above reviewers for peer reviewing the manuscript