

Incidence of Carcinoma Prostate in Cases of Benign Prostatic Hyperplasia in Rims Ranchi Jharkhand

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Abstract: Benign prostatic hyperplasia (BPH) is characterised by the non-malignant overgrowth of prostatic tissue surrounding the urethra, ultimately constricting the urethral opening, and giving rise to associate lower urinary tract symptoms. This was a prospective observational study of the histopathological findings of biopsy of patients undergoing TURP or open prostatectomy for obstructive urinary symptoms due to BPH admitted to Rajendra Institute of Medical Sciences, from January 2017 to October 2018. Those cases, with elevated age adjusted PSA values, abnormal DRE, documented UTI and proved adenocarcinoma prostate (CaP) were excluded from the study. 100 patients included in the study. Out of 100 BPH cases 8 cases were found to have occult carcinoma prostate on histopathological examination with overall incidence of 8%. Highest incidence was observed in the age group >80 years, which was 33.3%. Lowest incidence was seen in the age group 51-60 years, which was 2.2%, whereas it was nil in age groups below 50 years. The average age of incidence of occult carcinoma prostate was 60 years. A definite increase in the incidence of occult carcinoma prostate in BPH cases was observed with advancing age. Out of 8 cases of occult carcinoma detected, 7 cases were non-vegetarian and one was vegetarian, reflecting a higher incidence among the former. A positive family history was found in 3 out of 8 cases. Incidence of occult prostate cancer was only observed in open prostatectomy specimen.

Keywords: Benign prostatic hyperplasia (BPH), Occult carcinoma prostate, open prostatectomy, TURP.

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I. Introduction

Benign prostatic hyperplasia (BPH) is the non-malignant overgrowth of prostatic tissue surrounding the urethra, ultimately constricting the urethral opening, and giving rise to associate lower urinary tract symptoms (N Dhingra, D Bhagwat, 2011)¹. Anatomically, BPH arises from the transition zone of the prostate gland. Prostate cancer (PCa) is an adenocarcinoma, which classically arises from the peripheral zone of the prostate gland and a small percentage arising from the transition zone. In only 20% of cases do BPH and PCa co-exist in the same prostatic zone (S Miah, J Catto, 2014)².

The term “incidental prostatic carcinoma” was first proposed by the World Health Organization (WHO) in 1974 to denote carcinoma detected by chance during microscopic examination of a tissue sample removed by transurethral resection (TUR) or open adenectomy. A carcinoma is referred to as occult when it produces clinical evidence such as metastases or tumor markers, without the existence of the primary tumor being known. The clinically manifest prostatic carcinoma is a tumor that has clinical signs and that is histologically or cytologically confirmed (Jens E, 2012)³.

The incidence of and mortality from prostate cancer are increasing yearly. Prostate cancer now exceeds lung cancer as the most commonly diagnosed cancer in males and is the second leading cause of male cancer deaths. Of all tumours, the prevalence of prostate cancer increases the most rapidly with age. Although the factors responsible for the development and progression of prostate cancer to a clinically manifest form are not known, there is evidence that environmental factors may play a role. There are a number of similarities between benign prostatic hyperplasia (BPH) and cancer. Both diseases have striking similarities with regards to androgen-dependence driving their pathophysiology, inflammatory components which contribute to the development of the diseases, and shared genetic and epigenetic alterations. Both display a parallel increase in prevalence with patient age according to autopsy studies, although cancer lags by 15–20 years. Both require androgens for growth and development, and both respond to antiandrogen treatment regimens. It is important to exclude cancer in patients presenting with symptoms of bladder outlet obstruction presumably due to BPH. For

such patients, digital rectal examination (DRE) and at least in high-risk patients, serum prostate specific antigen (PSA) determination must be done. Transrectal ultrasound (TRUS) should be employed in patients with elevated PSA levels to determine the volume of the prostate, the relative contribution of BPH to volume, and the PSA density (ratio of PSA level to volume). Biopsy should be obtained from any area suspicious for cancer. Early detection and treatment of cancer when it is localized offers the greatest chance for cure, Bostwick DG (1992)⁴. However, a causal relationship between these diseases has not been established.

Aims and Objectives

- To identify prostate cancer incidence in patients of benign prostatic hyperplasia.
- To characterise the variation in the incidence of the prostatic cancer in case of BPH with age.
- To determine the probability of the prostatic cancer in case of prostatectomy by doing HPE of excised prostatic specimen.

II. Materials And Methods

This was a prospective observational study of the histopathological findings of biopsy of patients undergoing TURP or open prostatectomy for obstructive urinary symptoms due to BPH admitted to Rajendra Institute of Medical Sciences, from January 2017 to October 2018 through emergency or surgical outdoor. Those cases, with elevated age adjusted PSA values, abnormal DRE, those with documented UTI and proved adenocarcinoma prostate (CaP) were excluded from the study. After approval from Institutional Ethics Committee of Rajendra institute of Medical Sciences, Ranchi, Jharkhand, India, 100 patients were included in the study. Informed written consent was obtained from the patients.

A careful and detailed history was taken in every case. A thorough clinical examination including those of cardiovascular, respiratory, nervous and musculoskeletal systems was conducted in all cases. Digital Rectal Examination (DRE) was done in the left lateral position. When the rectum was loaded with faeces, an enema was given before rectal examination. When patient presented with acute retention of urine rectal examination was done after catheterization of the patient. Cases with a hard nodule, fixity of the gland on DRE or any other doubtful feature suggesting malignancy of prostate were discarded. The study consisted strictly of, only those cases in which, the diagnosis of benign hypertrophy was undisputed by the clinical findings comprising of firm enlargement of the prostate with no nodularity felt, median sulcus prominent, rectal mucosa free and non restricted mobility of the gland.

Routinely in every case, blood was examined for total and differential white cell count, haemoglobin percentage, bleeding time, clotting time and Blood sugar (both fasting and post prandial). Kidney function was assessed by examination of serum creatinine and blood urea. Routine examination of urine was also done. Status of prostate was assessed by examination of Serum Prostate Specific Antigen. Those cases with PSA more than 10 ng/ml were excluded from the present study group. Abdominal and transrectal ultrasonographic examination of the prostate was done for evidence of any nodularity or signs of malignancy and those cases were discarded.

The patient was subjected to surgery after thorough investigations when patient's condition stabilized and after pre- anaesthetic check up. The tissues removed at operation were processed and subjected to histopathological examination.

III. Results

In the present study 100 cases of Benign Prostatic Hyperplasia (BPH) was observed for the incidence of occult malignancy in the postoperative histopathological examination. The results of this study are summarized as follows.

Number of occult carcinoma detected = 8

Incidence of occult carcinoma in cases of BPH = 8% Histological Type = All adenocarcinomas

Table 1: Age incidence of benign hypertrophy of prostate

Age group (in years)	No. of cases of BPH	Percentage
31 – 40	1	1
41 – 50	17	17
51 – 60	45	45
61 – 70	21	21
71 – 80	13	13
> 81	3	3

Highest incidence of BPH cases (45%) belonged to age group 51-60.

Youngest patient = 39 years

Oldest patient = 86 years

Table 2: Age incidence of occult carcinoma of prostate in relation to BPH

Age group (in years)	No. of BPH cases studied	No. with occult carcinoma	Percentage
31 – 40	1	Nil	--
41 – 50	17	Nil	--
51 – 60	45	1	2.22
61 – 70	21	3	14.28
71 – 80	13	3	23.07
> 81	3	1	33.33

The highest incidence of occult carcinoma prostate cases belonged to the age group > 80 (33.3%). Youngest patient = 55 years; Oldest patient = 84 years

Table 3: Incidence of occult carcinoma of prostate in relation to the diet status

Diet status	Number	Percentage
Vegetarian	1	12.5
Non-vegetarian	7	87.5

Majority of the patients were non-vegetarian (87.5%).

Table 4: Incidence of occult carcinoma of prostate in relation to family history

Family history	Number	Percentage
Positive (with prostate cancer)	3	37.5
Negative	5	62.5

Family history does not appear to have any bearing on the incidence of occult carcinoma prostate.

Table 5: Relationship of occult carcinoma of prostate with weight of prostate

Weight of prostate (gms)	Number	Percentage
21-30	1	12.5
31-40	Nil	-
41-50	2	25
51-60	3	37.5
61-70	Nil	-
71-80	Nil	-
81-90	Nil	-
91-100	Nil	-
101-110	1	12.5
111-120	1	12.5

Weight of the enucleated prostate in which occult carcinoma was found varied from 29 gms to 113 gms. Average weight of the tissue 56.93 gms. Weight does not seem to have any relation with the occurrence of occult carcinoma prostate.

Table 6: Degree of differentiation

Differentiation	Number
Well Differentiated	8
Moderately Differentiated	Nil
Poorly Differentiated	Nil

All the cases were Well Differentiated.

Table 7: Types of operation for prostatectomy

Type of operation	Number of cases	Cases with occult carcinoma
Transvesical prostatectomy (Freyer's)	62	8
Transurethral prostatectomy (TURP)	38	Nil

IV. Discussion

The main preoperative diagnostic tools to confirm prostate cancer include serum PSA, DRE and imaging modalities. PSA is considered a better predictor of cancer than DRE or TRUS. However, serum PSA levels may be elevated in the presence of BPH, prostatitis, and other non-malignant condition.⁵

Since the discovery of latent carcinoma in surgically enucleated benign prostates by Albarran and Hulle, in the year 1900, several workers have conducted studies in this field to substantiate his findings.⁶ The most striking feature in them is the wide range of variation. Primarily this may be attributed to the difference in techniques used. In enucleation prostatectomy, only part of the gland that has undergone hyperplasia is removed and rest of the gland is left behind. As carcinomas most commonly arise in the peripheral zone, therefore the

occurrence of malignant foci in enucleated specimens has to be infrequent. On the contrary in autopsy specimens, the whole of the prostate is made available for microscopic scrutiny and so the incidence has to be high. This probable disparity in the incidence, though appears logical, does not seem to hold good, as both low and high incidences has been reported.

The incidence of Occult carcinoma taking all age groups together, reported in surgical specimens varied widely from

0.02 to 36.4%. This may be either due to the difference in the method of examination or the criteria of malignancy fixed by these authors. The incidence noticed in this study was found to be 8%. The highest incidence of occult carcinoma of the prostate was found to be in the age group >80 years (33.3%), which is well comparable with the findings of (48.8%) Hirst and Bergman (1954)⁷. Several other workers such as Moore (1935)⁸, Gaynor (1938)⁹, Labess (1952)¹⁰ and Franks (1954)¹¹ have also recorded similarly highest incidence in this age group.

There is an obvious increase in the incidence of occult carcinoma with increasing age as seen in this present series. This is in accordance with the previous finding as reported by Gaynor (1938)⁹ and Franks (1954)¹¹. Their observations were in postmortem specimens. Gaynor (1938) in a study of 1045 BPH cases observed that the highest incidence of occult carcinoma prostate was in the age group 80-89 years (38.7%). The incidence was 28.3% in the age group 70-79 years, 17.8% in the age group 60-69 years, 10.4% in the age group 50-59 years, 4.9% in the age group 40-49 years and 4% in the age group 30-39 years.⁹ Franks (1954) in a study of 208 cases also observed the highest incidence of 66.7% in the age group > 80 years. The incidence of occult carcinoma prostate was 40% in the age group 70-79 years, 30.2% in the age group 60-69 years, 29% in the age group 50-59 years and no cases of occult carcinoma was found below the age of 50 years.¹¹

It is to be noted that in Labess study the highest incidence of benign hyperplasia is seen in the 7th decade whereas in this study it is seen to be in the 6th decade. There was no case of BPH above 90 years in this present study, which is in accordance with the low average life span of Indian population. On the other hand benign hyperplasia and occult carcinoma occur at a comparatively earlier age group in Indian males. It may possibly be related to sexual habits, food habits or racial factors as well.¹⁰

As observed by Koloneal (1983)¹², Giovannucci (1993)¹³, and Whittmore (1995)¹⁴, dietary fat, especially animal fat,

standout as an important risk factor. This may be the reason for higher incidence of occult carcinomas (87.5%) noted among the non-vegetarian patients in this present study.

Presence of prostate cancer in the male relatives is a definitive risk factor as has been suggested by Carter (1993).¹⁵

A positive family history noted in 3 patients of occult carcinoma out of 8 in the present study. Since most of the patients were of low socio-economic group and uneducated, a proper family history could not be elicited from them as they were unaware of the disease.

In the present series it is seen that the incidence of occult carcinoma of the prostate is only marginally more frequent in patients with serum PSA level more than 4ng/ml. Hence no definite conclusion could be drawn from this study that the occurrence of high levels of serum PSA has any bearing on the occurrence of occult carcinoma.

As for the histological variety of the occult carcinoma, the present study has resemblance to the various previous studies. Albarran and Hulle in their initial discovery in 1900 stated that all the occult carcinomas were adenocarcinomas.⁶ This was later substantiated by Riaboff (1954)¹⁶, Denton (1967)¹⁷ and by J. I. Epstein (2000)¹⁸. In this present study also all the 8 cases of occult carcinoma detected were found to be adenocarcinomas. Since Moore (1935)⁸ it has been an accepted fact that these occult carcinomas are well differentiated and of low grade variety. This was further proved by the work of Franks (1954)¹¹ and Greene & Simon (1955-56)¹⁹. The present study, too, revealed that all the 8 cases of occult carcinoma were well differentiated, i.e., low-grade.

There seems to be no particular pattern in the occurrence of occult carcinoma with weight of the prostate in the present study. In Jophy Varghese's (2016)²⁰ study the incidence of an occult CaP was inversely proportional to the weight of resected gland. No other literature regarding the relationship of occult carcinoma prostate with weight of the benign prostate was found; hence it could not be compared.

In Abedi (2018)²¹ study 84 patients (19.9%) had PCa (40 patients who underwent TURP [12.6%] and 44 patients who underwent OP [40.7%] groups). Zigeuner et al²² showed that in their study of detection of PCa

by TURP or open surgery in patients with previously negative TRUS-Bx, the overall probability of diagnosing PCa by TURP in patients with obstructive voiding symptoms and clinical suspicion for PCa, but negative prostate biopsy, was less than 8%, and so they did not recommend TURP for diagnostic purposes. In present study Pca detected in 8 patients who underwent open prostatectomy and by TURP no patient with Pca detected.

V. Conclusion

The rate of incidence of occult carcinoma of prostate (Pca) in benign hypertrophy cases undergoing TURP as well as open prostatectomy was found to be 8% in this study and was appears to be related with advancement of the age. The study showed that open prostatectomy had higher ability for detecting Pca than TURP.

The crippling complications of malignancy can be prevented by early detection, watchful surveillance and earliest treatment, if there is progression of disease. Hence all enucleated specimens of BPH cases should be subjected to a scrupulous histopathological examination.

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