



## Original Research Article

# INCIDENTAL PROSTATE CARCINOMA IN TRANSURETHRAL RESECTION OF PROSTATE SPECIMENS AND ASSOCIATED HISTOPATHOLOGICAL PARAMETERS: A RETROSPECTIVE ANALYSIS IN A TERTIARY CARE HOSPITAL IN NORTH INDIA

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Received : 19/01/2025  
Received in revised form : 03/03/2025  
Accepted : 18/03/2025

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DOI: 10.70034/ijmedph.2025.1.354

Source of Support: Nil.  
Conflict of Interest: None declared

Int J Med Pub Health  
2025; 15 (1); 1897-1901

### ABSTRACT

**Background:** The incidence of Prostate cancer is higher in Western countries in comparison to Asian Counterparts. Some studies have shown incidental Carcinoma prostate in transurethral resection of Prostate (TURP) specimens but data on Indian literature is limited. Our 5-year retrospective analysis aims to identify incidental prostate cancer in TURP specimens and its relation with histopathologic parameters.

**Materials and Methods:** A retrospective 5-year analysis of 500 TURP specimens were collected between December 2019 and January 2025 and the histopathology report was finalized by two pathologists. Patients with known prostate cancers or any other carcinomas were excluded. Groups were divided into BPH and Carcinoma prostate and Carcinoma prostate cases were further divided into less than equal to 65 years and more than 65 years.

**Results:** Out of a total of 500 TURP specimens on histopathological examination incidental Carcinoma Prostate was identified in (79/500)15.8% of cases with incidence more common in men more than 65 years. All of them were Adenocarcinoma. A higher percentage of high Gleason grade was seen in 79 cases overall and also in men greater than 65 years. Lymphovascular invasion and Perineural invasion were more common in higher-grade prostate cancer.

**Conclusion:** Our findings support and conclude that a large proportion of incidental prostate cancer is being detected in the Indian population and many of them present at higher age, with higher Gleason score, and grade, and with more chances of Lymphovascular invasion and Perineural invasion. However, since our study was limited to a particular geographical location, ethnicity, and socio-economic background could have also influenced the study outcome.

**Keywords:** Incidental prostate cancer, TURP specimens, India, Gleason grade.

## INTRODUCTION

Among all cancer-related deaths Prostatic carcinoma is the fifth most common cause,<sup>[1]</sup> of mortality in men. It is more common in Western countries with the highest incidence in America (154.8 cases per

1,00,000 men) as a higher detection rate is facilitated by the availability of screening modalities. As of 2022 Asia has the lowest incidence and mortality rates for prostate cancer with an age-adjusted incidence rate of 12.6 and a mortality rate of 3.8 per 100,000 persons.<sup>[2]</sup> With the

migration of rural population to urban areas, lifestyle changes, as well as the accessibility of medical facilities an increasing number of cases are being diagnosed yearly in India where incidence was lower earlier. The average annual incidence in India ranges from 5.0-9.1/ 1,00,000 men per year.<sup>[1,3]</sup> In most Asian countries, screening which is a combination of PSA, DRE, and TRUS is seldom used to identify Carcinoma prostate, resulting in diagnoses at more advanced stages.

The risk factors for the development of Carcinoma prostate include increasing age, positive family history, ethnicity, geographical location, obesity, history of vasectomy, exposure to carcinogens, estrogens, oxidants, and inherited genetic mutations. These agents damage the prostatic epithelium and set the stage for acquiring genetic and epigenetic changes, that lead to cancer development.<sup>[4,5]</sup> Carcinoma Prostate is a disease of the elderly and is rarely seen in patients younger than 40 years. The age at presentation ranges from 60 to 74 years, with a mean of 67 years. More than 85% of cases are men over 60 years of age. Only 10% of cases are seen in patients less than 54 years of age.<sup>[3,4,6]</sup>

## MATERIALS AND METHODS

A retrospective 5-year analysis of TURP specimens was done between December 2019 and January 2025 at the Histopathology Department of a Tertiary care Hospital. TURP specimens were obtained by urologists at the hospital. Patients with known prostate carcinoma or other primary and secondary carcinomas were excluded.

TURP chips were sent to the Pathology Department with a requisition form for histopathological examination. All specimens were weighed and standard handling was performed. For specimens weighing  $\leq 10$  g, the entire specimen was processed and was subjected to histopathological examination. For specimens weighing  $> 10$  g, the first 10 g were processed with an additional 2 g for every 10 g of resected tissue. Histopathology reports were interpreted by two pathologists.<sup>[7,8]</sup> On the basis of 2005 International Society of Urological Pathology (ISUP) consensus guidelines Gleason scoring was done.<sup>[9]</sup>

Limited data related to age and demographics was collected from medical records. Data were collected on Excel and statistical analysis was completed on SPSS 26 software. Chi-square was used where possible to assess and analyze the data and  $P < 0.05$  was considered statistically significant. Data of 500 cases was divided into BPH and Prostate Carcinoma

and Carcinoma Prostate was further divided based on age less than and equal to 65 years and more than 65 years. Histopathological parameters like Gleason score, Gleason grade, Lymphovascular invasion, and Perineural invasion were identified and correlated.

## RESULTS

A total of 500 TURP specimens were subjected to histopathological examination. Incidental Prostatic carcinoma was detected in 79/500 of them with an incidence of 15.8%. All of them were Adenocarcinoma. The rest 421 cases were diagnosed as Benign Prostatic hyperplasia (BPH). Incidence of incidental Carcinoma Prostate was 8.02 % (17/212) in men  $\leq 65$  years and 21.5% (62/288) in men more than 65 years (Figure 1). The youngest patient with Carcinoma Prostate was 52 years old and the oldest patient with Carcinoma Prostate was 90 years old. Among prostate carcinoma cases, Carcinoma Prostate was more common (78.4%) in men greater than 65 years (62/79 cases) in comparison to BPH which was also found in the younger age group with an incidence of 53.7% in men greater than 65 years and 46.3% in men  $\leq 65$  years.

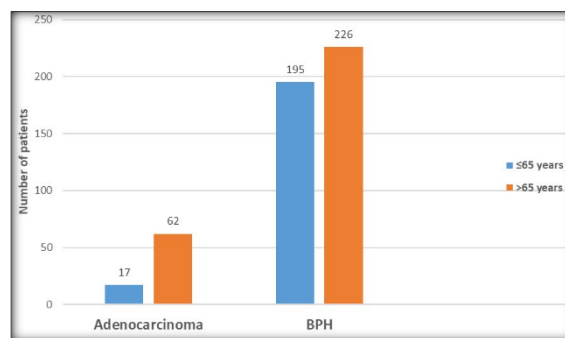


Figure 1:

Out of 79 cases of incidentally detected Carcinoma Prostate 6 cases of GG1 (GS 3+3), 15 cases of GG2(GS3+4), 16 cases of GG3(GS 4+3),15 cases of GG4 (12 of GS 4+4, 2 of GS 5+3 and 1of GS 3+5) and 27 cases of GG5 (19 cases of GS 4+5, 6 cases of GS 5+4 and 2 cases of GS 5+5) were detected (Table 1). The distribution of cases showed that higher Gleason grades (GG4 and GG5) are more prevalent, with GG5 accounting for the highest percentage (34.17%). This suggests that more aggressive tumor grades are relatively common in incidentally detected cases which was statistically significant association ( $P = 0.029$ ).

Table 1:

Gleason grade	Number of Cases	P value
GG1(GS 3+3)	6	P= 0.029
GG2 (GS 3+4)	15	
GG3 (GS 4+3)	16	
GG4	12	
GS 4+4		

GS 5+3	2	
GS 3+5	1	
GG5		
GS 4+5	19	
GS 5+4	6	
GS 5+5	2	
<b>Total</b>	<b>79</b>	

Men greater than 65 years had a higher Gleason score (GS score 8 to 10) in comparison with younger men. (Table 2). In men greater than 65 years GG4 was found in 38/62 cases, and GG5 was found in

10/62 cases in comparison to men less than equal to 65 years which had 9/17 cases of GG4 and 0/17 cases of GG5.

**Table 2:**

Age	Gleason grade									Total
	GG1 (GS 3+3)	GG2 (GS 3+4)	GG3 (GS 4+3)	GG4			GG5			
				GS 4+4	GS 5+3	GS 3+5	GS 4+5	GS 5+4	GS 5+5	
≤65 years	4	4	0	2	4	3	0	0	0	17
greater than 65 years	2	11	1	14	8	16	2	6	2	62
<b>Total</b>	<b>6</b>	<b>15</b>	<b>1</b>	<b>16</b>	<b>12</b>	<b>19</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>79</b>

Overall Perineural invasion (48/79) was more common than Lymphovascular invasion (32/79). Higher Gleason grade was associated with a higher incidence of Lymphovascular invasion (LVI) and Perineural invasion (PNI) with Grade 4 and Grade 5

showing LVI 40 % and 88.88% of cases and PNI in 60% and 100 % of cases respectively in comparison to grade 1 and grade 2 that showed LVI 0,0, 12.5% and PNI 0, 33.3 %,43.75% of cases respectively. [Table 3]

**Table 3:**

Gleason grade	LVI		Total	PNI		Total
	Absent	Present		Absent	Present	
GG1(GS 3+3)	6	0	6	6	0	6
GG2 (GS 3+4)	15	0	15	10	5	15
GG3 (GS 4+3)	14	2	16	9	7	16
<b>GG4</b>						
GS 4+4	7	5	12	4	8	12
GS 5+3	2	0	2	1	1	2
GS 3+5	0	1	1	1	0	1
<b>GG5</b>						
GS 4+5	3	16	19	0	19	19
GS 5+4	0	6	6	0	6	6
GS 5+5	0	2	2	0	2	2
<b>Total</b>	<b>47</b>	<b>32</b>	<b>79</b>	<b>31</b>	<b>48</b>	<b>79</b>

## DISCUSSION

It has been reported on autopsy that up to 60% of 70-year-olds and 80% of 80-year-olds have latent prostate cancer.<sup>[10]</sup> Data published in literature of Western nations like the study done by Dondu Nergiz et al,<sup>[11]</sup> in Turkey revealed a 13.3% incidence of incidental prostate cancer. In contrast, few Western studies in Dublin,<sup>[12]</sup> and New York,<sup>[13]</sup> had comparatively lower incidences of Carcinoma Prostate in TURP specimens (10.3% and 1.4% respectively). Our study showed that 15.8% of our patients in this zone of North India had incidental prostatic cancer in TURP specimens. This incidence is higher than a retrospective analysis from a Tertiary Care Hospital in Pakistan which found 10.7% of patients to have incidental prostate cancer,<sup>[14]</sup> while a study by Jophy Varghese et al in India found an incidence of occult Carcinoma Prostate in their study group to be 5.2 %, <sup>[15]</sup> (31/597).

The increasing life span of elderly males and improved availability of medication facilities can explain an increase in overall incidence in the Indian population. Lifestyle changes, Ethnicity and genetics could also account for these variations and suggest the need for additional investigations to further validate geographical differences. Our study to a certain extent has provided data on incidental Carcinoma Prostate in TURP specimens in a part of the densely populated state of Uttar Pradesh which to the best of our knowledge is lacking in Indian literature which has mentioned cumulative risk of getting prostate cancer in Delhi, Kamrup Urban, Bangalore, Kolkata, Arunachal Pradesh etc but lacks the data of Uttar Pradesh.<sup>[2]</sup>

Also, our study revealed that the incidence of incidental Carcinoma Prostate was 8.02 % (17/212) in men ≤65 years and 21.5% (62/288) in men more than 65 years. This is slightly lower than a study done by Marlon Perera et al in which incidental prostate cancer was 28.7% in men more than 65 years old and 13.4% in men aged ≤ 65 years.<sup>[16]</sup>

Our study had cases with higher Gleason score and grade (Gleason GG5 -34.17%) among incidentally detected Carcinoma Prostate. In contrast, studies done by D.M. Matanhelia et al,<sup>[12]</sup> and Brandon Otto et al,<sup>[13]</sup> revealed a maximum number of cases of incidentally detected Carcinoma Prostate were in grades 6 and Grade 7. Lack of awareness, geographical differences, ethnicity, and the aggressive nature of prostate cancer in the Indian population could contribute to delayed diagnosis. Also men greater than 65 years had higher Gleason scores (72.15% cases with GS scores 8 to 10) in comparison to younger men. This is comparable to a study done by Vinayak Muralidhar et al which also showed an association between older age and increasing Gleason Score.<sup>[17]</sup>

High-grade tumors have more aggressive features microscopically, increased cellular proliferation, invasive potential, and a higher risk of biochemical recurrence. Our study also revealed that a Higher Gleason grade was associated with a higher incidence of Lymphovascular invasion (LVI) and Perineural invasion (PNI). This is in concordance with many other studies that show similar results in which LVI and PNI were associated with higher pathological stages and higher Gleason scores.<sup>[18,19,20]</sup>

The limitation of our study was that it was done in a particular geographical location so there could be a lack of representation and geographical bias.

## CONCLUSION

Our study indicates a higher burden of incidental prostate cancer detected in TURP specimens in the Indian population in this geographical location. Many of them presented at higher age, with higher Gleason score, and grade, and with more chances of lymphovascular invasion and perineural invasion. To the best of our knowledge literature is limited in this part of Northern India regarding incidental Carcinoma prostate and related age and histopathological parameters. The increasing population and thus increasing aging males in the country, lack of awareness, limited screening, ethnicity, geographical differences, lifestyle changes, and socio-economic disparity may be attributed to a higher incidence of incidental Carcinoma Prostate in our study. Since our study was done in a limited population of a particular geographical location there could be a lack of representation and geographical bias so further investigations and studies are needed.

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