

European Journal of Health Sciences (EJHS)



T1a/T1b transitional zone prostate cancer detection rates in patients who had TURP for clinically diagnosed benign prostatic enlargement in Southern Nigeria

John E. Raphael and Onyeahunam N. Ekeke



T1a/T1b transitional zone prostate cancer detection rates in patients who had TURP for clinically diagnosed benign prostatic enlargement in Southern Nigeria

¹*John E. Raphael and ¹Onyeannunam N. Ekeke

¹Urology Department, University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria

*Corresponding Author's Email: drraphaeljohn@gmail.com

ABSTRACT

Background: Transurethral resection of the prostate (TURP) removes the obstructing adenoma that grows from the transitional zone of the prostate. Resected chips are routinely sent for histologic examination. Incidental findings of prostate cancer in the TURP specimen for the clinically diagnosed benign disease may occur. The American Joint Committee on Cancer (AJCC) TNM staging of prostate cancer allocates T1a if <5% of the resected chips are malignant and T1b if >5% are malignant.

Aim: To determine the frequency of incidental prostate cancer rate in TURP specimens of patients who had the procedure for clinically diagnosed benign prostatic enlargement.

Methodology: This was a retrospective study carried out over a period of 8years from January 2013 to December 2020 on patients who had TURP for clinically diagnosed BPE or biopsy diagnosed BPH. All the patients had TURP for benign enlargements of the prostate. The resected prostate chips were sent for histopathological analysis. Patients with incomplete data and patients who had transrectal peripheral zone prostate biopsy confirmed cancers before TURP were excluded from this study. The data was collated using Microsoft Excel version 2020 and was analyzed using SPSS version 20.

Results: There were 220 male patients with a mean age was 65.89 ±9.95years, and median age was 65years. The 60-69years group had the highest incidence of PCa. The T1a/T1b adenocarcinoma detection rate was 13.6% (30). 54.6% (120) had BPH only, and 31.8% (70) had BPH with prostatitis. All incidentally diagnosed T1a/T1b cancers were adenocarcinomas. The majority of the T1a/T1b adenocarcinomas, 43.3% (13), were poorly differentiated, while 36.7% (11) and 20% (6) had well and moderate differentiation, respectively.

Conclusion: The Incidental T1a/T1b transitional zone adenocarcinoma detection rate in TURP specimens in the study was 13.6%. The high Gleason's grade adenocarcinoma was the most frequent. Even when perceived as clinically benign, communication of the risk of cancer detection to the patient is pertinent and should be a routine part of the informed consenting process before TURP.

Keywords: *Incidental cancer, prostate cancer, transitional zone, T1a, T1b, TURP*

INTRODUCTION

Prostate cancer is the second most common cancer and the fifth leading cause of cancer death among men worldwide, ^[1] Prostate cancer (PCa) incidence is rising globally due to improved screening and diagnosis, ^[2] even though many in sub-Saharan Africa still present late due to ignorance. ^[2,3,4] The risk factors for Prostate cancer include increasing age, positive family history and black race. ^[5] Adenocarcinoma is the most common histologic type of prostate cancer in this environment. ^[6] The peripheral zone of the prostate is the area where most prostate cancer develops in 70-80% of cases; 20-25 % occur in the transitional one and 5% in the central zone. ^[7,8] Pathological evaluation of TRUSS-guided prostate needle biopsy specimen offers the definitive diagnosis of the histological type, volume and grade of prostate cancer.

Transurethral resection of the prostate (TURP) is the gold standard for surgical management of patients with benign prostatic hyperplasia (BPH).^[9] BPH commonly involves the transitional zone of the prostate. TURP involves endoscopic resection of the enlarged obstructing adenoma that grows from the transitional zone of the prostate. Resected chips are routinely sent for histologic examination. An incidental finding of prostate cancer in the TURP specimen for the benign disease may occur. The American Joint Committee on Cancers (AJCC) TNM staging of prostate cancer allocates T1a if <5% of the resected chips are malignant and T1b if >5% are malignant. ^[10] Detection of carcinoma will require additional investigations and treatment depending on the stage. We aim to determine the frequency of incidental prostate cancer detection in TURP specimens of patients who had the procedure for clinically diagnosed benign prostatic enlargement.

METHODOLOGY

This was a retrospective study carried out over a period of 8years, from January 2013 to December 2020, on 220 patients who had TURP for clinically diagnosed BPE or biopsy diagnosed BPH. All the patients had TURP for benign enlargements of the prostate. The resected prostate chips were sent for histopathological analysis. Three different pathologists analyzed the prostate specimen. The pathology reports were retrieved, and their age, histologic diagnosis, and Gleason's grade detected in the TURP specimen were obtained. Patients with incomplete data and patients who had transrectal peripheral zone prostate biopsy confirmed cancers before TURP were excluded from this study. The data was collated using Microsoft Excel version 2020 and was analyzed using SPSS version 20.

RESULTS

220 male patients had TURP for BPE/BPH over the study period. The modal age group was the 60-69years. The mean age was 65.89 ±9.95years; the median age was 65years. The T1a/T1b adenocarcinoma detection rate was 13.6% (30). The remaining patients had BPH only (54.6%, (120)) and BPH with prostatitis in 31.8% (70). All transitional zone prostate cancers were adenocarcinomas. The majority, 43.3% (13), of the adenocarcinoma was poorly differentiated while 36.7% (11) and 20% (6) had well and moderate differentiation, respectively.

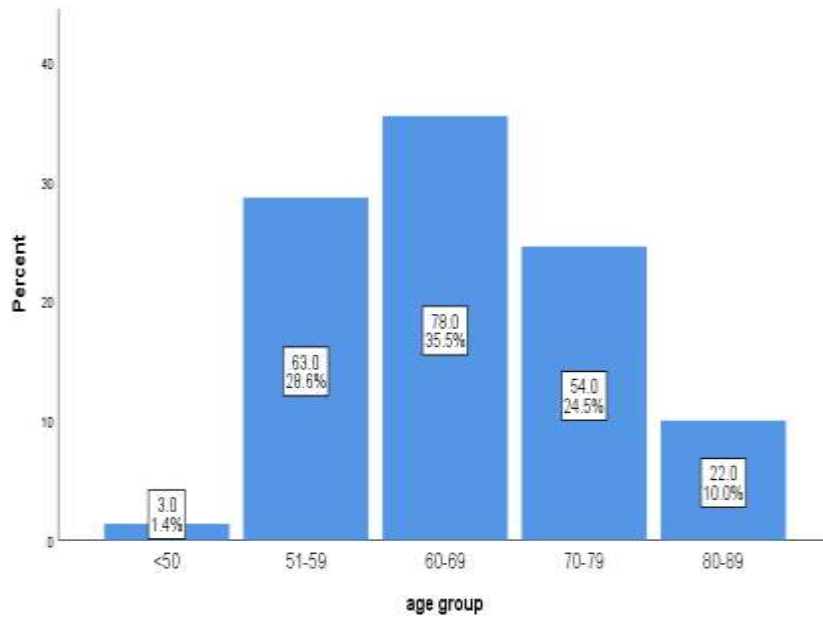


Figure 1. Age group distribution of patients that had transurethral resection of the prostate.

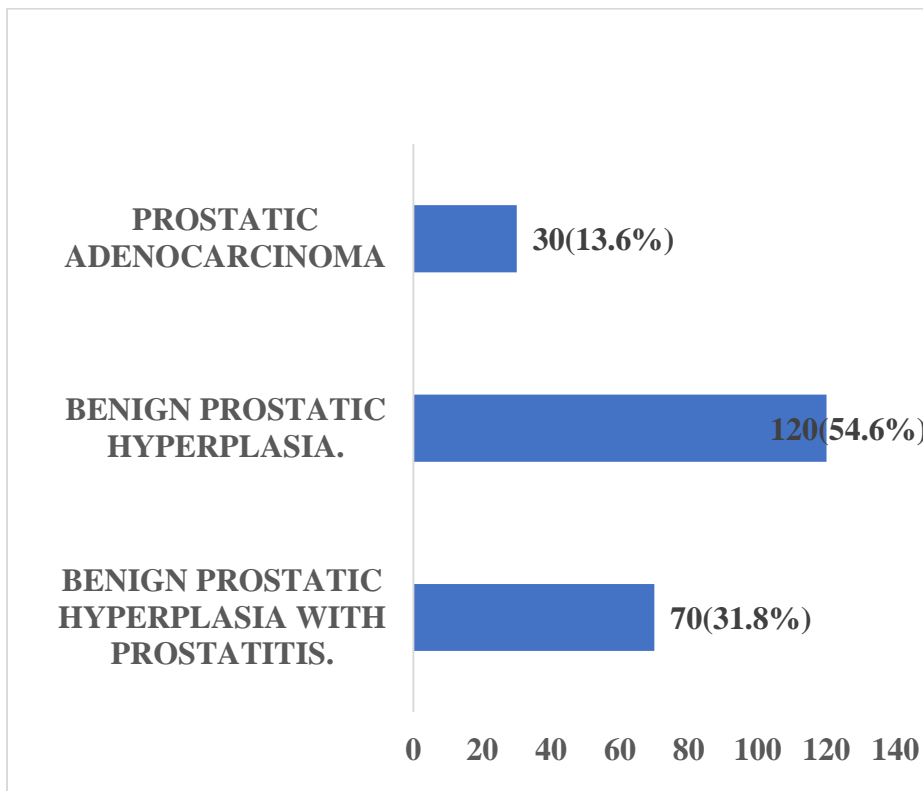


Figure 2. Histopathological distribution in patients that had transitional zone resection during transurethral resection of the prostate

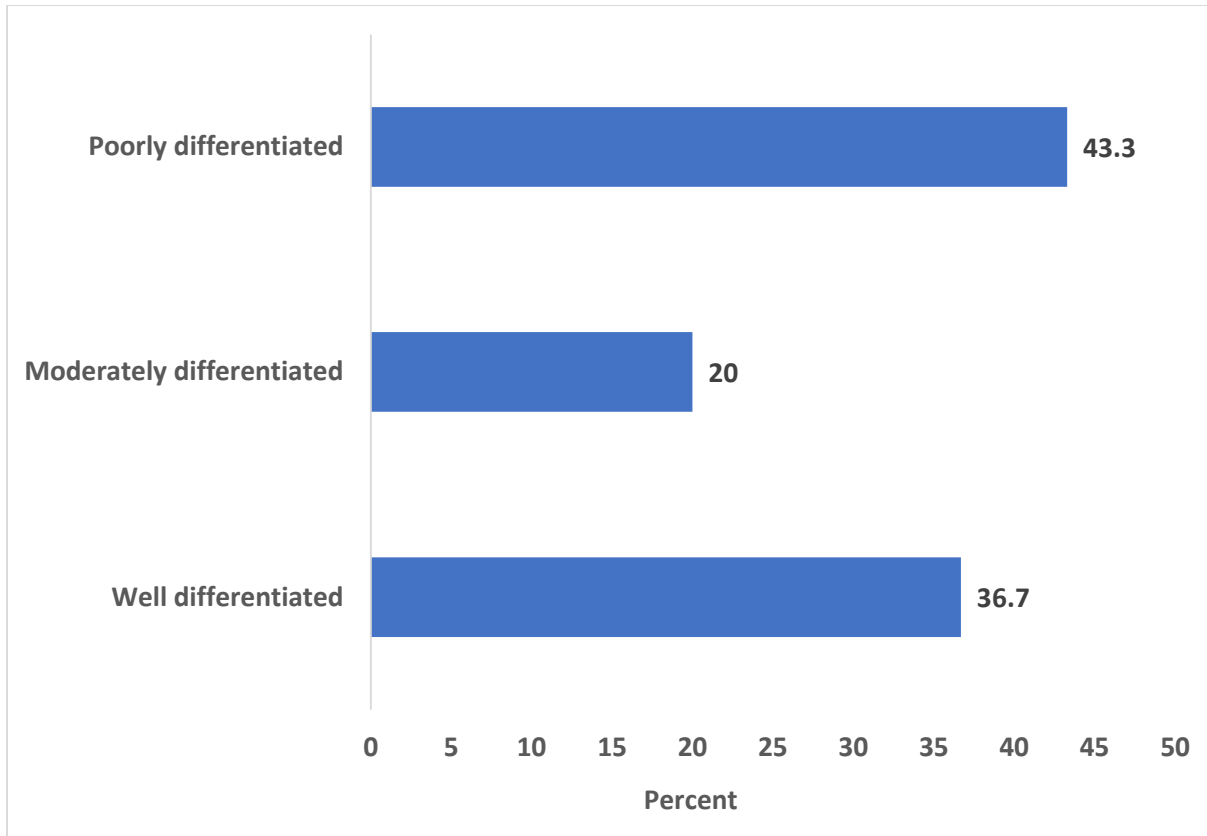


Figure 3. Histological types of incidental prostate cancer in patients with transurethral resection of the prostate.

DISCUSSION

While established as the gold standard modality for treating BPE in developed countries, TURP is a relatively an emerging procedure in the West African Sub-region. Most government hospitals do not perform the procedure routinely due to a lack of equipment and human resources capacity. This may account for the relatively small number of cases over the study period. BPH is a disease of ageing, and the mean age of our study population of 65.89 ± 9.95 years is similar to the global observations in the age range from other studies.^[11,12]

Digital rectal examination, PSA testing, and advancement in imaging have reduced the detection of T1a/T1b incidental prostate cancer after TURP. One cohort study evaluated the prevalence of T1a/T1b PCa in post TURP specimens in the pre- PSA era and PSA era. They found that T1a/T1b PCa was more prevalent in the Pre- PSA compared to the PSA era.^[13] The incidence in the pre- PSA era reported traditionally, for patient counselling purposes, preoperatively was 10-31%.^[14,15] The cancer detection rate in the PSA era was observed to have reduced globally to about 5-14%.^[13]

In the study, a T1a/T1b detection rate of 13.6% was found. An earlier study by Obiorah CC and Nwosu SO in Port Harcourt on biopsy specimens of the patient that had simple open prostatectomy between 1997 to 2006 found an incidental cancer rate of 17.2%.^[6] However, lower PCa detection

rates in TURP chips were also observed in studies from Northern Nigeria that showed rates of 5.6%^[8] and 10%.^[13]

Adenocarcinomas are the most frequent histologic type of prostate cancer globally.^[14] All our cases of incidental T1a/T1b prostate cancers were adenocarcinomas. The transitional zone is the part of the prostate where BPH develops, and TURP is a form of transitional zone biopsy. In an adult with normal size prostate gland, the peripheral zone accounts for only about 5% of the total prostate volume, but the proportion increases significantly when enlarged.^[8,13] The peripheral zone is not usually involved in BPH but is the commonest site of prostate cancer in 70-80% of cases; 20-25% occur in the transitional zone, and 5% of PCa arise in the central zone.^[7] Peripheral zone PCa is associated with poorer pathological features and clinical outcomes than T1a/T1b transitional zone PCa.^[7,13]

One of the reasons for the observed trend toward a lower prevalence of incidental prostate cancer is the increasing use of medical treatment for BPH. This has resulted in a decrease in the number of TURP procedures performed. Additionally, many minimally invasive therapies such as urethral stenting, thermotherapy, cryotherapy, and microwave vaporization provide alternatives to patients mainly in developed countries.^[13] These options are at present rarely performed in Nigeria.

Some other studies have not found any variation in detecting T1a/T1b tumours with increased PSA screening. A Japanese study showed that improved screening did not change the frequency of T1a lesions but reduced the incidence of T1b lesions.^[16] Two studies in the United States in the early PSA era did not find any significant difference.^[17,18] This trend, however, may not be observed in our environment because TURP is still an emerging technology, and other alternatives minimally invasive procedures are barely available. More extensive regional cohort studies are required to evaluate these observations.

Lasers are increasingly used in developed countries and may soon overtake TURP in BPH treatment. Holmium laser vaporization has the drawback of not producing tissue for histologic evaluation, and many incidental prostate cancers may be missed. This may also contribute to the reduction in the rate of incidentally diagnosed T1a/T1b PCa. Adequate screening and clinical evaluation must be done before the vaporization procedures to diagnose occult cancers since this could indicate additional treatment.

Most incidental prostate cancers are occult, and some studies have suggested that active surveillance should be offered to these patients.^[19] However, any treatment should be based on the possibility of residual cancers and risk stratification for clinical progression.^[17] Predictors of clinical progression include elevated PSA after TURP and the Gleason score. It has also been noted that TURP for T1a or T1b is not a predictor of cancer progression or outcome.^[20]

An additional consideration is the heterogeneity of prostate cancer presentation. Prostate cancer in black Africans is more aggressive than in other races.^[21] Our study indicates that many of these incidental prostate cancers are high-risk cancers, as shown in Figure 3, and carry a tendency for aggressive clinical progression, requiring radical treatment. Hence, all cases must be individualized and stratified according to their risks to provide the most effective treatment.

A large number of the TURP specimens in our research were confirmed to harbour benign diseases in up to 86.4%; BPH (54.6%) and BPH with prostatitis (31.8%), as shown in figure 2. The use of digital rectal examination, PSA screening and transrectal ultrasound scan of the prostate have

contributed to improved diagnosis of benign diseases. However, the risk of transitional zone cancers, which cannot be palpated during DRE, and are often not routinely biopsied during the standard transrectal prostate biopsy should always be entertained.

CONCLUSIONS

The Incidental T1a/T1b transitional zone adenocarcinoma detection rate in TURP specimens in our study was 13.6%. Medical therapy for BPH widely used by medical practitioners could be responsible. The high Gleason's grade adenocarcinoma is the most frequent. Communication of the risk of cancer detection to the patient, even when perceived as clinically benign, is pertinent and should be a standard component of the informed consenting process before TURP.

RECOMMENDATIONS

Patients undergoing TURP for BPE/BPH need to be communicated the risk of cancer detection in the transitional zone following TURP for perceived benign enlargement of the prostate. It should be a routine part of the informed consenting process before TURP since additional treatment following a diagnosis of cancer may be required.

A negative biopsy following standard transrectal biopsy may not exclude transitional zone cancers. This should also be discussed when performing transrectal biopsies with patients.

REFERENCES

1. Hyuna Sung, Jacques Ferlay, Rebecca Siegel, et al.; Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 cancers in 185 countries. 2021
2. Ekeke O, Amusan O, Eke N. Management of prostate cancer in port Harcourt, Nigeria: changing patterns. *J West Afr Coll Surg.* 2012;2(3):58-77.
3. Ajape AA, Babata A, Abiola OO. Knowledge of prostate cancer screening among native African urban population in Nigeria. *Nigerian Quarterly Journal of Hospital Medicine.* 2009 Jul-Sep;19(3):145-147.
4. Enemugwem, Rogers A. et al. "Prostate cancer screening: assessment of knowledge and willingness to screen among men in Obio Akpor LGA, Rivers State, Nigeria." *African Journal of Urology.*2019; 25: 1-4.
5. Key T. Risk factors for prostate cancer. *Cancer Surv.* 1995; 23:63-77.
6. Obiorah CC, Nwosu SO; A Histopathological study of carcinoma of the prostate in Port Harcourt, Nigeria. *Nigerian Journal of clinical practice.*2011;14: 363-367
7. MR Cooperberg, SL Washington III, PR Carroll; *Cancer of the Prostate Gland: Smith and Tanagho's General Urology* 19th Edition, pg353, 2020
8. Ali, A., Du Feu, A., Oliveira, P. *et al.* Prostate zones and cancer: lost in transition?. *Nat Rev Urol* **19**, 101–115 (2022).
9. Alhasan SU, Aji SA, Mohammed AZ, Malami S. Transurethral resection of the prostate in Northern Nigeria, problems and prospects. *BMC Urology.* 2008;18.
10. Amin MB, Greene FL, Edge SB, et al. The Eighth Edition AJCC Cancer Staging Manual: Continuing to build a bridge from a population-based to a more "personalized" approach to cancer staging. *CA Cancer J Clin.* 2017;67(2):93-99.

11. Brandon Otto, Christopher Barbieri, et al.; Incidental Prostate Cancer in Transurethral Resection of the Prostate specimen in modern era. *Advances in Urology*, vol. 2014. Article ID 627290, 4 pages, 2014.
12. Janjua TK et al. Incidental finding of prostate cancer in Transurethral Resection of Prostate (TURP) specimens: a retrospective analysis from a Tertiary Care Hospital in Pakistan. *Pan African Medical Journal*. 2021;39(20). 10.11604/pamj.2021.39.20.26931.
13. Jones, J., Follis, H. & Johnson, J. Probability of finding T1a and T1b (Incidental) prostate cancer during TURP has decreased in the PSA era. *Prostate Cancer Prostatic Dis*. 2009; 12:57–60.
14. Ornstein DK, Rao GS, Smith DS, Andriole GL. The impact of systematic prostate biopsy on prostate cancer incidence in men with symptomatic benign prostatic hyperplasia undergoing transurethral resection of the prostate. *J Urol* 1997; 157: 880–883.
15. Argyropoulos A, Doumas K, Farmakis A, Aristas O, Kontogeorgos G, Lykourinas M. Characteristics of patients with stage T1b incidental prostate cancer. *Scand J Urol Nephrol* 2005; 39: 289–293.
16. Meguro N, Maeda O, Saiki S, et al. *Hinyokika Kyo*. 1998;44(9):639-643.
17. Monda JM, Barry MJ, Oesterling JE. Prostate specific antigen cannot distinguish stage T1a (A1) prostate cancer from benign prostatic hyperplasia. *J Urol* 1994; 151: 1291–1295.
18. Ornstein DK, Rao GS, Smith DS, Andriole GL. The impact of systematic prostate biopsy on prostate cancer incidence in men with symptomatic benign prostatic hyperplasia undergoing transurethral resection of the prostate. *J Urol* 1997; 157: 880–883.
19. Robinson D, Aus G, Bak J, et al. Long-term follow-up of conservatively managed incidental carcinoma of the prostate: a multivariate analysis of prognostic factors. *Scand J Urol Nephrol*. 2007;41(2):103-109.
20. Abedi AR, Ghiasy S, Fallah-Karkan M, Rahavian A, Allameh F. The Management of Patients Diagnosed with Incidental Prostate Cancer: Narrative Review. *Res Rep Urol*. 2020;12:105-109.
21. Smith ZL, Eggener SE, Murphy AB. African-American Prostate Cancer Disparities. *Curr Urol Rep*. 2017;18(10):81.