

# Comparison of Transrectal Prostate Digital and Ultrasound-Guided Core Biopsies in 400 Men in a Low-and-Middle Income Country

Junior Barthelemy Mekeme Mekeme<sup>1,2\*</sup>, Oriol Landry Mbouche<sup>1</sup>, Figuim Bello<sup>1,2</sup>, Bright Che Awondo<sup>1</sup>, Aurele Achille Mbassi<sup>2</sup>, Cedrick Jean Fouda<sup>2</sup>, Tax Liendi<sup>1</sup>, Marcella Biyouma<sup>1</sup>, Guillaume Gayma<sup>1</sup>, Marcel Junior Yon Mekeme<sup>1,3</sup>, Junior Ngue Ngue<sup>3</sup>, Mabah<sup>3</sup>, Paul Adrien Atangana<sup>4</sup>, Pierre Ongolo Zogo<sup>1,2</sup>, Pierre Joseph Fouda<sup>1,2</sup>, Noel Coulibaly<sup>5</sup>, Angwafo III Fru<sup>1</sup>, Maurice Aurelien Sosso<sup>1</sup>

<sup>1</sup>Faculty of Medecine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon

<sup>2</sup>Department and Urology and Andrology, Yaounde Central Hospital, Yaounde, Cameroon

<sup>3</sup>Higher Institute Medical Technology, Yaounde, Cameroon

<sup>4</sup>Anatomy and CytoPathology Laboratory "Centre Pasteur", Yaounde, Cameroon

<sup>5</sup>Felix Houphouet Boigny University of Cocody, Abidjan, Ivory Coast

Email: \*juniormekeme@yahoo.fr

**How to cite this paper:** Mekeme, J.B.M., Mbouche, O.L., Bello, F., Awondo, B.C., Mbassi, A.A., Fouda, C.J., Liendi, T., Biyouma, M., Gayma, G., Mekeme, M.J.Y., Ngue, J.N., Mabah, Atangana, P.A., Zogo, P.O., Fouda, P.J., Coulibaly, N., Fru, A.III and Sosso, M.A. (2023) Comparison of Transrectal Prostate Digital and Ultrasound-Guided Core Biopsies in 400 Men in a Low-and-Middle Income Country. *Open Journal of Urology*, 13, 418-432.

<https://doi.org/10.4236/oju.2023.1310048>

**Received:** September 2, 2023

**Accepted:** October 21, 2023

**Published:** October 24, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Background:** The diagnosis of prostate cancer (PCa) relies on clinical assessment with digital rectal examination, serum PSA and histological examination. Limitations in our technical facilities, high financial cost of ultrasound-guided biopsy often prevent us from implementing the guidelines on the practice of prostate biopsy. **Methods:** We conducted a retrospective and cross-sectional descriptive study comparing digital-guided and ultrasound-guided transrectal prostate biopsy of 400 patients over a period of 12 years in the Yaounde Central Hospital. We reviewed files of patients who underwent digital and ultrasound guided biopsy procedures. Data was analyzed using EPI info 7.0. Parametric variables were reported as means and standard deviations and percentages and counts were used to report categorical variables. **Results:** Out of the 400 patients, 292 digital-guided transrectal biopsies (73%) and 108 ultrasound-guided transrectal biopsies (27%) were performed in patients who were suspected of having prostate cancer (PCa). Patients were aged between 39 to 90 years. Both procedures were effective in identifying prostate cancer. Gleason score between 2 to 10 detected prostate adenocarcinoma for 301 patients (75.2%). The complications included anal pain, rectal bleeding, hematuria and urinary tract infections, with an occurrence rate similar for both ultrasound-guided (2.25%) and digitally-guided techniques (2.5%). Seven patients (1.75%) required hospitalization for management of complications. The

mortality rate was null. **Conclusion:** Both techniques are effective in detecting PCa with the similar complication rates. Digital-guided trans-rectal prostate biopsy still has its place in a resource-limited setting like ours.

## Keywords

Prostate, Biopsy, Digital Guided, Ultrasound Guided, Adenocarcinoma, Gleason Score

---

## 1. Introduction

Prostate cancer (PCa) is the most prevalent cancer and the second leading cause of cancer death in men [1]. Confirmation of diagnosis of prostate cancer is through histopathologic analysis of tissue cores obtained during a prostate biopsy. The common indications for prostate biopsy include abnormal findings on digital rectal examination, an increase in total PSA and the presence of suspicious lesions on prostate magnetic resonance imaging (MRI). It is an invasive procedure whose overall morbidity is between 3% and 23% and whose mortality is low but not zero [2] [3].

In the past, prostate biopsies were digital-guided through the perineal or trans-rectal route. Today, new prostate biopsy techniques are possible thanks to advances in radiological imaging. MRI-guided prostate biopsy has a higher sensitivity than ultrasound-guided prostate biopsy, but its realization requires a dedicated interventional Radiologist, specific equipment and certain technical aspects, which are not yet available in our context. As a result, prostate biopsies, either ultrasound or digital-guided, are commonly practiced. Transrectal ultrasound-guided prostate biopsy is the recommended technique, which has better diagnostic yield than digital-guided technique [4].

From a financial standpoint, the ultrasound-guided prostate biopsy has an estimated cost of 400\$ USD on average compared to that of the digital-guided prostate biopsy which is around 120\$ USD. Our patients often present late at advanced stages with complications. This delay in consultation often prevents the implementation of best practice guidelines with regards to the technique for prostate biopsy. However, the latter is pivotal in the histologic diagnosis, prognosis and management of prostate tumors.

In Cameroon, there is limited data on the techniques used for prostate biopsy. Thus, the purpose of this study was to report the experience of the Urology and Andrology Unit of the Yaounde Central Hospital of (YCH) on this subject.

## 2. Material and Methods

We retrospectively reviewed records of 400 patients over a period of 12 years (July 2008 to July 2020) who underwent transrectal ultrasound or digital-guided prostate biopsy at the urological surgical unit of Yaounde Central hospital

Yaounde (YCH). Our inclusion criteria were an abnormality on digital rectal examination, an increase in total serum PSA greater than 4 ng/ml, a free/total PSA ratio < 15% or the detection of suspicious lesions on imaging (ultrasound or prostate MRI) at the Urology and Andrology Unit of the Yaounde Central Hospital between January 2008 to December 2020. All patients who did not meet at least one of the criteria listed above were excluded from the study. Sociodemographic characteristics, clinical and paraclinical data, indications for biopsy and technique, post-biopsy complications and results of histopathologic analysis of biopsy cores or surgical specimens were obtained from medical records and relevant cancer registers.

### **2.1. Pre-Operative Preparation**

Prior consultation with a urologist was done to verify the use of an anticoagulant or platelet aggregation inhibitors, recent urinary tract infection and the exclusion of any contraindications to the procedure. Pre-biopsy assessment and patient preparation was done which include:

- Complete blood count with hemoglobin level and platelets counts; Urine culture and antibiotic sensitivity; Prothrombin time (PT); Activated partial thromboplastin time (APT).
- Rectal enema with water at room temperature using a 100 ml syringe the day before and the day of the procedure or taking a sachet of Sennosides A and B in a glass of water the day before the biopsy.
- Antibiotic prophylaxis with quinolones: Ciprofloxacin 500 mg in two daily doses the day before the examination and to continue for two days after the procedure.
- Post-biopsy re-adjustable analgesia: Paracetamol 1000 mg in three daily doses for three days after the procedure.
- Oral tranexamic acid 1000 mg after the procedure or three daily doses for three days after the procedure.

### **2.2. Biopsy Site and Anesthesia**

Most of the time, the preferred technique of performing a biopsy is by dividing the prostate into two lobes delimited in three zones: the base, the middle part and the apex. Two samples per zone are collected, a median and a lateral, thus giving 12 cores of 12 mm each. In order to improve the detection of cancer, additional samples could be taken in suspicious areas (nodule on DRE or hypo-echoic areas on ultrasound).

Local anesthesia of the prostate was performed in the periprostatic area by infiltrating 10 ml of 2% lidocaine. For ultrasound-guided biopsies, a size 22 lumbar puncture needle mounted on a lubricated endorectal probe covered with a condom and inserted into the lower 1/3 of the anal canal under ultrasound guidance. While for the digital-guided biopsies, a gloved and lubricated index finger helped guide the lumbar puncture needle into the lower 1/3 of the anal canal.

### 2.3. Digital-Guided Technique for Prostate Biopsy

After obtaining informed consent the patient was placed either in the lateral decubitus or gynecological position on the examination or operating table. A digital rectal examination was systematically carried out in order to assess the prostate, emptiness of the rectum and prepping of the perineum and the anal margin were done using gauze soaked in povidone iodine 10%.

A single 18 Gauge needle (blue), mounted on a single-use type or recyclable M coloplast® automatic trigger gun (**Figure 1**) was used for sampling. The index of the right or left finger lubricated with 2% lidocaine gel, 10 grams was used to orient the needle through the anal orifice unto the surface of the prostate. When the sample-collecting angle was optimal (**Figure 2**), the trigger button was pressed using the thumb firing the needle to obtain a 22 mm core length.

Each sample of 2 cores per zone was preserved separately in a vial of 30% aqueous solution with formalin diluted to 10% in normal saline 0.9% (**Figure 3**). Each sample identified according to the site and the date of sampling. The biopsy specimens were sent to the pathologist with a request form on the number of positive cores, percentage involvement of each positive core, the Gleason score/ISUP grade group, status of the peri-prostatic tissue (perineural involvement). At the end of the procedure, a gauze pack soaked in povidone iodine was introduced into the rectum about 4 cm from the anal margin and kept in place for at least 2 hours.



**Figure 1.** Digital-guided biopsy: sterile equipment and automatic biopsy gun (Source: Urology service YCH).



**Figure 2.** Digital-guided prostate biopsy technique (Source: Urology service YCH).



**Figure 3.** Vial containing biopsy samples preserved in formalin (Source: Urology service YCH).

#### 2.4. Ultrasound-Guided Technique for Prostate Biopsy

A decontaminated endorectal ultrasound probe (**Figure 4**) protected by a condom with a sterile needle guidance system, coated with a sterile ultrasound gel was necessary. A single 18 gauge (pink) needle was used, mounted on a reusable automatic trigger gun (**Figure 5**). The probe was inserted into the rectum and the prostate was marked in transverse or sagittal sections (**Figure 6**). The path for sampling was visible on the screen thanks to a preconfigured dotted line and the shot only triggered when the collecting angle was optimal. It was necessary to avoid perforation of the peri-prostatic vein (risk of sepsis) or perforating the prostatic urethra (risk of hematuria). As previously described, the biopsy cores were preserved in vials labelled according to the site and date of collection. The biopsy specimens were then sent to the pathologist for analysis as previously elaborated. At the end of the examination, the endo-rectal biopsy probe is removed, and a gauze pack soaked in an antiseptic solution was placed in the rectum as described above.

#### 2.5. Protocol for Prostate Biopsy Core Analysis

Regardless of the technique for collecting prostate biopsy samples, the analysis of these parts in the pathology unit is done according to the following protocol:

- Prostate core biopsies are fixed in 10% neutrally buffered formalin for 48 hours. They were then included in their entirety after evaluation of the volume. They were dehydrated with alcohols of increasing degree (50°, 70°, 80°, 90°, 95°, 100°), cleansed with xylene and embedded in hot liquid paraffin in a Leica-type automaton for 18 hours. Then they were coated with paraffin to form blocks. These were cut at 5 microns stained with hematin-eosin and observed under a Leica DM 1000 optical microscope (**Figure 7**).



**Figure 4.** Ultrasound machine with rectal probe (Source: Urology service YCH).



**Figure 5.** Reusable automatic biopsy gun, needle guidance system, biopsy needle (Source: Urology service YCH).



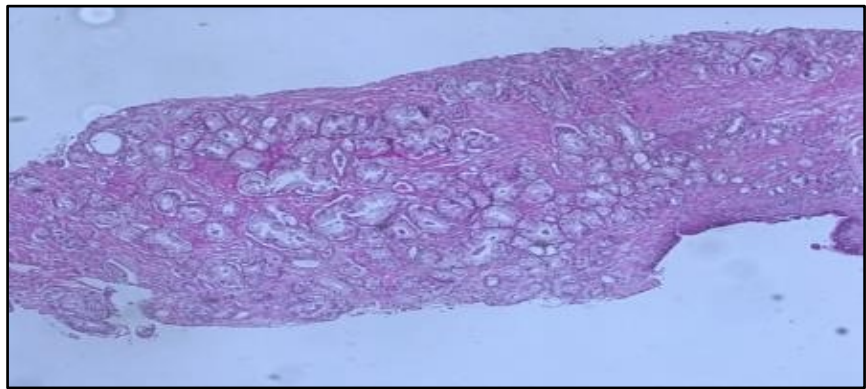
(a)



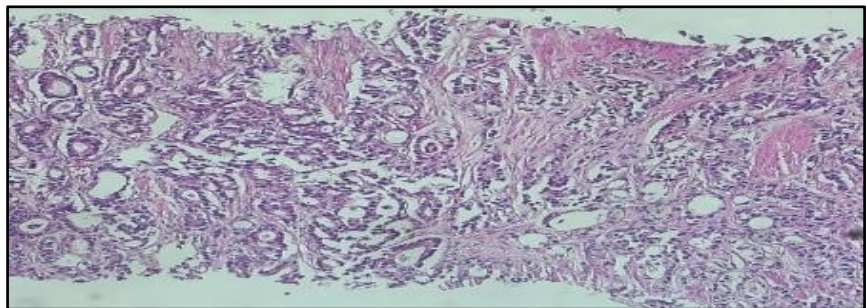
(b)

**Figure 6.** Ultrasound-guided sample collection of the prostate (**Figure 6(a)**), transrectal ultrasound section of the prostate (**Figure 6(b)**) (Source: Urology service YCH).

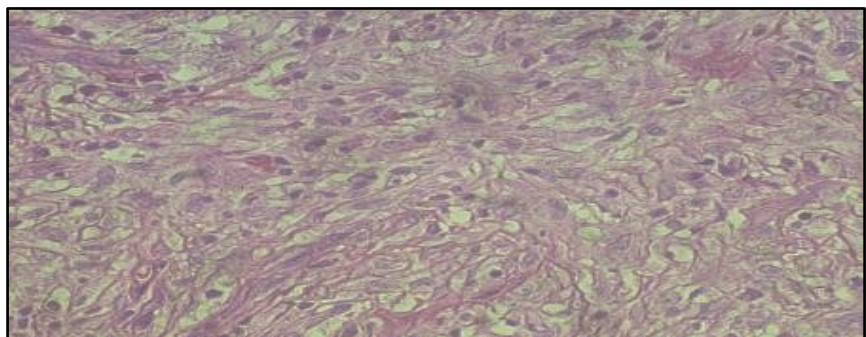
- Specimens obtained from open prostatectomy were fixed in 10% neutrally buffered formalin for 48 to 72 hours. After being weighed, measured and stained (different color ink depending on the left or right side), oriented samples were taken (apex, base and intermediate zones) ensuring the piece has been included in full. The samples were dehydrated with alcohols of increasing degree (50°, 70°, 80°, 90°, 95°, 100°), cleansed with xylene and embedded in hot liquid paraffin, in a Leica-type automaton for 18 hours. Then they were coated with paraffin to form blocks. These were cut at 5 microns, stained with hematin-eosin and observed under a Leica DM 1000 optical microscope (**Figure 7**).



(a)



(b)



(c)

**Figure 7.** Slides of histopathology under an optical microscope ((a), (b), (c)). (a) Grade 3 prostate adenocarcinoma: simple glands, separated from each other, with well-defined contours; (b) Grade 4 prostate adenocarcinoma: presence of fused glands, irregular contours; (c) Grade 5 prostatic adenocarcinoma: fused glands, cells in sheets with clear cytoplasm with an anaplastic contingent.

## 2.6. Statistical Analysis

Data on sociodemographic characteristics, clinical and paraclinical features, indications for biopsy and technique, post-biopsy complications and results of histopathologic analysis of biopsy cores or surgical specimens were recorded for each patient. Data collection was achieved using structured questionnaires by consulting patient records and post-biopsy reports. Data was analyzed using EPI info 7.0. Parametric variables were reported as means and standard deviations and percentages and counts were used to report categorical variables.

### 3. Results

A total of 400 files of patients who underwent digital-guided and ultrasound guided transrectal ultrasound were collected. We registered 292 digital-guided transrectal biopsies (73%) and 108 ultrasound-guided transrectal biopsies (27%) which were performed in patients suspected of having prostate cancer (PCa).

#### 3.1. Socio-Demographic Characteristics

The mean age of patients who underwent a transrectal prostate biopsy was  $68.1 \pm 8.5$  years with extremes of 44 years and 90 years. For those who had a digital-guided puncture the mean age was  $66.8 \pm 9.3$  years with extremes of 48 and 90 years while those who had an ultrasound-guided puncture,  $68.1 \pm 7.9$  years with extremes of 44 and 90 years (**Table 1**).

Patients aged 61 to 70 years were the most represented age group in this series.

#### 3.2. Clinical Features

Most of the patients who underwent digital-guided and ultrasound-guided prostate biopsy presented in an advanced stage of disease ( $n = 297$ , 74.25%) urinary retention as ( $n = 281$ , 70.25%) followed by obstructive lower urinary tract symptoms ( $n = 251$ , 62.75%) (**Table 2**).

**Table 1.** Distribution of patients according to age group and prostate biopsy technique.

Age range (years)	41 - 50	51 - 60	61 - 70	71 - 80	81 - 90
Ultrasound-guided biopsy	21	34	17	21	4
Digital-guided biopsy	2	62	146	67	26
<b>Total cases</b>	23	96	<b>163</b>	88	30

**Table 2.** Clinical presentation of patients at the time of consultation.

Clinical presentation	Number of cases	Percentage
Poor general state of health	297	74.25
Obstructive lower urinary tract symptoms	281	70.25
Acute urinary retention	251	62.75
Irritative urinary lower urinary tract symptoms	119	29.75
Referrals for prostate biopsy examinations	60	15
Routine consultation for annual check-up	46	11,5
Hematuria	46	11,5
Post laminectomy and biopsy of vertebral metastasis	18	4.5
Paraplegia	16	4



The indication for prostate biopsy varied according to the patient. Some consulted directly at the urology service or were referred to us by a colleague, mainly from neurosurgery, with neurologic complications secondary to probable metastases. Patients presented a total serum PSA > 4 ng/ml, during the etiological workup for back pain and/or the presence of spinal cord compression syndrome and/or lower motor neuron lesion and/or partial neurologic deficit, appearance of secondary lesions on imaging of the spine or histopathology results of laminectomy specimens suggestive of metastatic bone lesions secondary to prostate cancer (**Table 2**).

There was a variation in PSA as a function of age shown in **Table 3**. Younger patients had a low PSA and so ultrasound-guided ultrasound was mostly done because these patients have a high probability of having the localized form of prostate cancer.

We performed a transrectal prostate biopsy on all our patients. We performed 292 digital-guided prostate biopsies versus 108 ultrasound-guided prostate biopsies over the entire study period in 2018, we performed the highest number of prostate biopsies (**Figure 8**).

The most common histological type identified by both techniques was adenocarcinoma (**Figure 9**).

Digital-guided prostate biopsy detected 203 cases of PCa while ultrasound-guided biopsy picked up 85 cases (**Figure 10**).

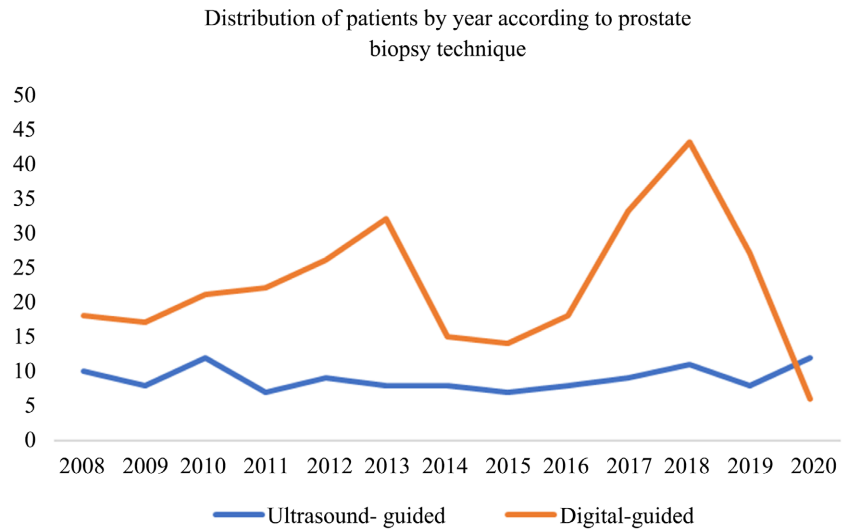
The majority of cases (222) had a Gleason score  $\geq 7$ , affecting mainly the age group of 61 to 70 years. 73.7% of the cases were high risk according to D'AMICO's classification (**Table 4**). The most frequently reported post-procedure complication were pain and rectal bleeding which was present in patients who underwent the digital-guided technique as compared to ultrasound-guided technique (**Figure 11**).

**Table 3.** Variation of PSA as a function of age.

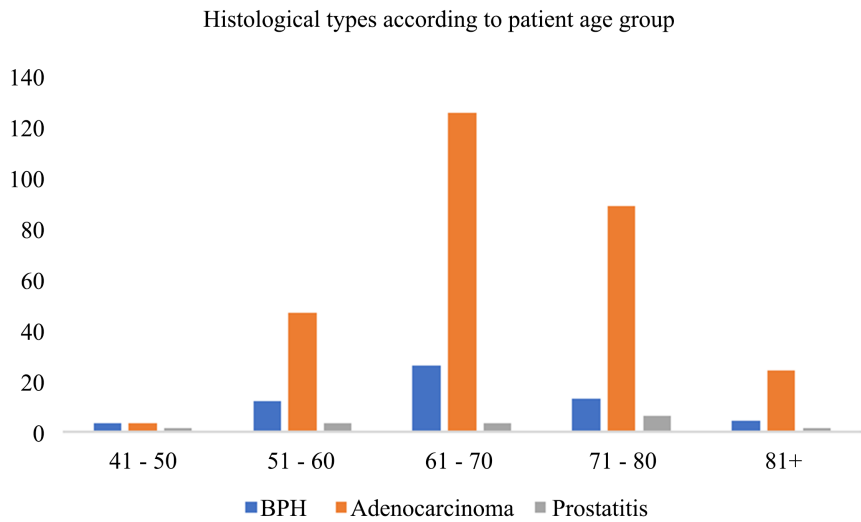
Age group (years)	41 - 50	51 - 60	61 - 70	71 - 80	81 - 90	P-value
Median (Q <sub>1</sub> , Q <sub>3</sub> )	11,6 (5.0, 19.3)	33.7 (12.0, 106.8)	62.6 (22, 232)	63.7 (24.4, 206.0)	246.0 (73.2, 91.8)	<b>0.003</b>
Number of patients	5	57	151	98	26	

**Table 4.** Gleason score according to patient age.

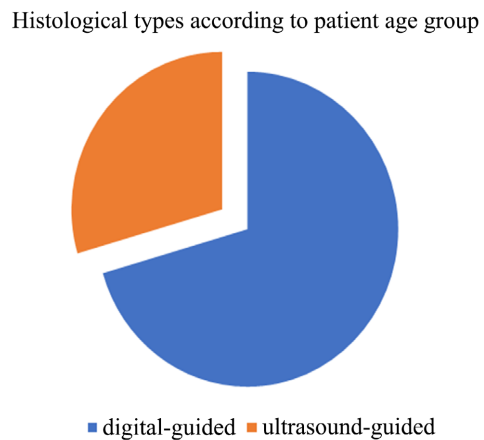
Age/Gleason Score	41 - 50	51 - 60	61 - 70	71 - 80	80 - 90	Total
<5	00	11	00	00	00	11
>5 and <7	00	24	26	18	00	68
$\geq 7$	03	12	103	80	24	222
<b>Total</b>	03	47	129	98	24	301



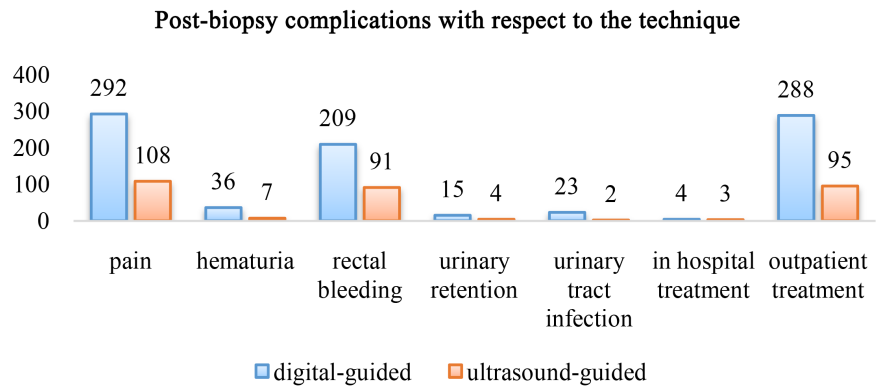
**Figure 8.** Distribution of patients by year according to prostate biopsy technique.



**Figure 9.** Histological types according to patient age group.



**Figure 10.** Detection of prostate adenocarcinoma according to the type of biopsy technique.



**Figure 11.** Clinical Complications following prostate biopsy.

#### 4. Discussion

Prostate biopsy is essential for the diagnosis of prostate cancer (PCa), with the exception of cancers discovered after analysis of surgical specimens during the surgical treatment of benign prostatic hyperplasia (BPH). Like digital rectal examination, any other suspicious finding on paraclinical or imaging assessment suggestive of PCa is an indication for a biopsy. Several studies show similar sensitivity and specificity rates between ultrasound and digital guided biopsy techniques [5] [6]. Although it is possible to detect non-palpable organ-confined prostatic lesions on ultrasound. The additional cost and time required do not allow ultrasound guidance to be a routine diagnostic procedure in the detection of prostate cancer in our setting. In our study, the presence of prostatic induration and/or a suspicious nodule during digital rectal examination was an indication for a prostate biopsy.

Ultrasound-guided prostate biopsy was introduced at the Yaounde Central Hospital in the 2000s. The advent of prostate biopsy by a transrectal approach using an endorectal ultrasound probe has advantageously replaced the digital-guided approach. [7]. Endorectal ultrasound probe guidance has become routine for prostate biopsy because it provides details and better localization of the lesion than digital guided technique [7]. Current guidelines recommend prostate biopsy for all patients with serum PSA > 4 ng/ml and/or abnormal prostate morphology on digital rectal examination sometimes confirmed by positive lesions on prostate MRI. Before HOLM [8] in 1981 proposed guiding the needle using an endorectal probe, the biopsy needle was guided intra-rectally by the finger.

Out of 400 transrectal prostate biopsies performed in our study, ultrasound-guided biopsy was done in 108 cases while 292 cases in our series were digital-guided. It is possible that the absence of ultrasound machine, the cost of this procedure or a long-standing practice of biopsy without ultrasound were the reasons for these practices department [9] [10] [11].

Resnick *et al.* [12] evaluated 45 patients with both prostate biopsy techniques and detected one case of prostate cancer histologically in 14 patients, whereas

ultrasound-guided biopsy detected cancer in 12 and digital-guided biopsy detected cancer in 13. Resnick concluded that guided biopsies were not necessary when a distinct nodule was palpable [10] [12]. In our study, the late consultation of our patients at a very advanced stage of the disease and their increasing number per year as presented in **Figure 8** could explain the high number of digital-guided biopsies. There was therefore the need to find histological evidence before starting palliative treatment. Weaver *et al.* [13] evaluated 51 patients with prostatic abnormalities and digital-guided biopsy detected 9 cases of prostate cancer whereas ultrasound-guided biopsy detected prostatic adenocarcinoma in 23 patients, including all those detected digitally. This latter study suggests that ultrasound-guided biopsy is mandatory in the evaluation of palpable abnormalities. In our study, younger patients under the age of 60 were more likely to have localized prostate cancer and could benefit from curative treatment, which justifies the high number of ultrasound-guided biopsies in this age group as presented in **Table 1**. Weaver *et al.* evaluated 151 patients using transrectal prostate biopsy method, and 75 cases of prostate cancer were diagnosed [14]. Only one more cancer was detected by ultrasound-guided biopsy as compared to digital-guided puncture. It therefore seems that the two techniques are comparable in patients with nodules palpable on rectal examination. This would frequently be the case in our daily practice, given the late consultations of our patients at a very advanced stage of the disease, as shown in **Figure 8**. Türkeri *et al.* [15] in their study showed that the combination of the two biopsy techniques did not improve the cancer detection rate, as all cancers were detected by ultrasound-guided biopsies. The prostates of two patients with prostate cancer appeared benign on endorectal ultrasound, but symmetrical ultrasound-guided biopsies detected cancer in these patients. In our work, saturation biopsies were not performed through the digital guided technique because all our patients under 60 years of age with a suspicious PSA level mostly benefited from an ultrasound-guided biopsy as shown in **Table 4**. Therefore, in the presence of a suspicious digital rectal exam with no abnormalities on endorectal ultrasound, standard ultrasound-guided biopsies are recommended. This was not the case in our work in patients over 60 years of age who, under the same conditions, benefited in the majority of cases from a digital-guided biopsy as shown in **Table 1**.

In our study, prostate cancer was detected in 301 patients, representing a frequency of 75%, which is similar to a study carried out in Mali [16]. Digital-guided prostate biopsy detected prostate cancer in 203 patients (67.4%) in the current study, which is higher than the 45% detected by Türkeri *et al.* [15]. As for ultrasound-guided biopsy, 85 patients with prostate cancers were diagnosed (78%) higher than the 54% detection rate observed by Ndiaye [17].

The average age of patients who underwent a biopsy was  $68.1 \pm 8.5$  years with extremes of 44 and 90 years which is similar to a study carried out in Bamako [16]. The majority of cases were between the ages of 61 to 70. This confirms that it is essential to initiate screening campaigns for prostate cancer in our country.

In our series, the PSA assay was always available before the biopsy. Regarding the serum PSA level, it varied between 6 and 11165.8 ng/ml in our series with a median of 62.6 ng/ml. In the cohort of digital-guided prostate biopsies, the median was 73.6 ng/ml with extremes of 27.0 and 316.0 ng/ml and for those who had an ultrasound-guided prostate biopsy, the median was 15 ng/ml with extremes 10.2 and 60.5 ng/ml. Indications for prostate biopsy included elevation of PSA level greater than or equal to 4 ng/ml. The median PSA in our series is higher than that of 19.8 ng/ml found by Ndiaye in Senegal [17]. This difference could be attributed to the disparities between our studies in terms of study period of 12 years and 2 years respectively and also due to sample size difference of 400 and 231 respectively.

In our series, Gleason score  $\geq 7$  was the most represented. These data are similar to those reported in Mali by Diarra *et al.* [16].

Regarding complications following transrectal prostate biopsy, the severity is usually minimal if antibiotic prophylaxis is administered. According to the literature, in the absence of antibiotic prophylaxis, post-biopsy urinary tract infections account for about 4% to 25% and 0% to 7% of severe infections [18]. Infectious complications depend on the absence of rectal preparation, absence of antibiotic prophylaxis and a diameter of the biopsy needle size greater than 14 [19]. The complication rate varies between 3% to 23% of cases [18] [19]. Infectious and hemorrhagic complications are the main complications of transrectal prostate biopsy, which is similar to the results in our series.

## 5. Conclusion

The ultrasound-guided technique according to the guidelines is still recommended though there has been a recent drift towards the use MRI/ultrasound-guided fusion biopsies whose acquisition and use requires a suitable software and a highly skilled personnel.

We believe that in settings where the technical platform is limited, patients present at advanced clinical stages of the disease, the digital-guided transrectal biopsy technique remains relevant for a histologic diagnosis. The financial cost of the digital-guided transrectal biopsy technique is low, but the quality of the examination depends on the experience of the practitioner. Both prostate biopsy techniques were well tolerated in our study thanks to good preparation and the results are seemingly satisfactory.

## Limitation

This study was carried out in one center, but we wish to extend the study to other centers.

## Ethical Clearance

Study was approved by institutional ethics committee.

## Conflicts of Interest

The authors declare no competing financial or personal interests.

## Authors' Contribution

All the authors contributed to the research work. They read and agreed to the final version of the manuscript.

## References

- [1] Rozet, F., *et al.* (2018) Recommandations françaises du Comité de Cancérologie de l'AFU pour le cancer de la prostate—Actualisation 2018-2020: Cancer de la prostate. *Progrès en Urologie*, **28**, R81-R132. <https://doi.org/10.1016/j.purol.2019.01.007>
- [2] Aubert, J. (1992) Complications des biopsies prostatiques. Analyse d'une série de 4764 biopsies. *Progrès en Urologie*, **2**, 484-487.
- [3] Mondet, F., Boyer, C., Oddou, J.H., Corsois, L. and Collomb, D. (2009) La mention systématique d'un indice de qualité dans les comptes rendus de biopsies prostatiques influence les pratiques professionnelles. *Progrès en Urologie*, **19**, 825-829. <https://doi.org/10.1016/j.purol.2019.01.007>
- [4] Bruyère, F., Cros, L., Destembert, B., Turban, N., Dumon, R., Freslon, L., Malavialle, F., Houin, P., Badiere, H., Charlon, R. and Lanson, Y. (2005) Technique de réalisation des Biopsie Prostatiques dans la région du centre. *Progrès en Urologie*, **15**, 427-432.
- [5] Cupp, M.R. and Oesterling, J.E. (1993) Prostate-Specific Antigen, Digital Rectal Examination, and Transrectal Ultrasonography: Their Roles in Diagnosing Early Prostate Cancer. *Mayo Clinic Proceedings*, **68**, 297-306. [https://doi.org/10.1016/s0025-6196\(12\)60052-4](https://doi.org/10.1016/s0025-6196(12)60052-4)
- [6] Chodak, G.W., Wald, V., Parmer, E., Watanabe, H., Ohe, H. and Saitoh, M. (1986) Comparison of Digital Examination and Transrectal Ultrasonography for the Diagnosis of Prostatic Cancer. *Journal of Urology*, **135**, 951-954. [https://doi.org/10.1016/S0022-5347\(17\)45935-0](https://doi.org/10.1016/S0022-5347(17)45935-0)
- [7] Pokorny, M.R., de Rooij, M., Duncan, E., Schroder, F.H., Barentsz, P.R., *et al.* (2014) Prospective Study of Diagnostic Accuracy Comparing Prostate Cancer Detection by Transrectal Ultrasound-Guided Biopsy versus Magnetic Resonance (MR) Imaging with Subsequent MR-Guided Biopsy in Men without Previous Prostate Biopsies. *European Urology*, **66**, 22-29.
- [8] Holm, H.H. and Gammelgaard, J. (1981) Ultrasonically Guided Precise Needle Placement in the Prostate and the Seminal Vesicles. *Journal of Urology*, **125**, 385-387. [https://doi.org/10.1016/S0022-5347\(17\)55044-2](https://doi.org/10.1016/S0022-5347(17)55044-2)
- [9] Renfer, L.G., Schow, D., Thompson, I.M. and Optenberg, S. (1995) Is Ultrasound Guidance Necessary for Transrectal Prostate Biopsy? *Journal of Urology*, **154**, 1390-1391. [https://doi.org/10.1016/S0022-5347\(01\)66873-3](https://doi.org/10.1016/S0022-5347(01)66873-3)
- [10] Sow, M., Essame Oyono, J.L., Nkegoum, B. and Mbakop, A. (2001) La biopsie de la prostate: Indications, technique et resultants. À propos de 161 cas colligés au Service d'Urologie de l'Hôpital central de Yaoundé. *Médecine d'Afrique Noire*, **48**, 159-162.
- [11] Mbassi, A.A., Magni, E.T., Douanla, D.E., Kamga, J., Mekeme, J., Jiatsa, N.L.R., Ngo Nonga, B., Sando, Z., Angwafo, F., *et al.* (2017) A Comparative Study of Digit-Guided Versus-Echo-Guided Prostate Biopsies in Diagnosing Prostate Cancer at Yaounde Central Hospital and at le Centre Medical la Cathedrale-Cameroon. *Journal of Cancer Research and Clinical Oncology*, **1**, 2-6. <https://www.springer.com/>

- [12] Resnick, M.I. (1988) Transrectal Ultrasound Guided versus Digitally Directed Prostatic Biopsy: A Comparative Study. *Journal of Urology*, **139**, 754-757. [https://doi.org/10.1016/S0022-5347\(17\)42623-1](https://doi.org/10.1016/S0022-5347(17)42623-1)
- [13] Van Every, M.J. and Rooney, B. (1993) Comparison of Ultrasound-Guided and Digitally Directed Transrectal Biopsy of Palpable Prostate Lesions. *Urology*, **42**, 677-679. [https://doi.org/10.1016/0090-4295\(93\)90532-F](https://doi.org/10.1016/0090-4295(93)90532-F)
- [14] Weaver, R.P., Noble, M.J. and Weigel, J.W. (1991) Correlation of Ultrasound-Guided and Digitally Directed Transrectal Biopsies of Palpable Prostatic Abnormalities. *Journal of Urology*, **145**, 516-518. [https://doi.org/10.1016/S0022-5347\(17\)38384-2](https://doi.org/10.1016/S0022-5347(17)38384-2)
- [15] Türkeri, L., Tarcan, T., Biren, T., Küllü, S. and Akdaş, A. (1995) Transrectal Ultrasonography versus Digitally Guided Prostate Biopsies in Patients with Palpable Lesions on Digital Rectal Examination. *British Journal of Urology*, **76**, 184-186. <https://doi.org/10.1111/j.1464-410X.1995.tb07671.x>
- [16] Diarra, A., Keita, M.M., Eyongeta, D.E., Coulibaly, M., Berthe, H. and Ouattara, Z. (2018) La Biopsie De La Prostate Au Service D'urologie Du Chu Luxembourg: A Propos De 100 Cas. *Uro' Andro*, **1**, 519-523.
- [17] Ndiaye, M., Jalloh, M., Ndoeye, M., *et al.* (2021) Ultrasound-Guided Prostate Biopsy: Indication, Morbidity and Outcome at Hopital General Idrissa Pouye. *African Journal of Urology*, **27**, Article No. 54. <https://doi.org/10.1186/s12301-021-00155-9>
- [18] Presti Jr, J.C., O'Dowd, G.J., Miller, M.C., Mattu, R. and Veltri, R.W. (2013) Extended Peripheral Zone Biopsy Schemes Increase Cancer Detection Rates and Minimize Variance in Prostate Specific Antigen and Age Related Cancer Rates: Results of a Community Multi-Practice Study. *Journal of Urology*, **169**, 125-129. [https://doi.org/10.1016/S0022-5347\(05\)64051-7](https://doi.org/10.1016/S0022-5347(05)64051-7)
- [19] Lechevalier, E. (1996) La ponction biopsie de prostate. *Progrès en Urologie*, **6**, 507-518.