



A Comparative Study of Digit-Guided Versus Echo-Guided Prostate Biopsies in Diagnosing Prostate Cancer at Yaounde Central Hospital and at Le Centre Médical La Cathedrale – Cameroon

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Citation: Mbassi AA, Magny ET, Douanla DE, Kamga J, Mekeme J (2020) A Comparative Study of Digit-Guided Versus Echo-Guided Prostate Biopsies in Diagnosing Prostate Cancer at Yaounde Central Hospital and at Le Centre Médical La Cathedrale – Cameroon. J Cans Oncol Res 1(1): 103

Abstract

Introduction: Prostate cancer is a hormone-dependent malignancy with slow evolution. Biopsy for histopathology of samples enables us to assert the diagnosis. Nowadays EGPB is the standard. Is DGPB as effective as EGPB?

Goal: Comparing DGPB with EGPB in diagnosing prostate cancer in Yaounde.

Methods: This is a 5 years descriptive, cross-sectional, retrospective study. The settings were Yaounde Central Hospital and le Centre Médical La Cathedral. We collected sociodemographic data, past history, signs and symptoms of prostate cancer, and work-up's results. Patients had an indication for prostate biopsy based on: suspicious rectal exam and PSA above 4ng / ml.

Results: We selected 106 files: 51 ultrasound-guided, 55 digit-guided. Patient age range was 47-85 years with a mean age of 65.02 years. We had 68 cases of cancer (64.15%): 42 (61.76%) echo-guided and 26 (38.25%) digit-guided.. Among the 51 with nodules on rectal exam, 43 (84.3%) had cancer. For a PSA < 10ng / ml, between 10 to 50ng / ml, between 50 to 100ng / ml and > 100ng / ml were respectively numbered 5, 20, 7 and 10 EGPB cancers versus 1, 5, 8 and 12 DGPB. We sampled 6-14 carrots by echo-guidance versus 2-6 by digit-guidance. Another tissue instead of the prostate was often sampled. These were striated muscle and rectal mucosa. This was in 7.3% of echo-guided versus 13.7% of digit-guided. Biopsy complications were hemorrhage and infection. Six on 55 patients had post-biopsy bleeding in the echo-guided group versus 11 on 51 in the digit-guided group. 3.6% of echo-guided versus 11.8% of digit-guided had post-biopsy infection. Gleason score varied from 5 to 9. Sixteen patients had a Gleason lower than the average (6.39).

Conclusion: EGPB yields more reliable results than DGPB. It improves detection of prostate cancer, provides core-samples purely prostatic and yields lesser complications. EGPB is the standard for prostate-sampling and for proper follow-up.

Keywords: Prostate Cancer; EGPB: Echo-Guided Prostate Biopsy; DGPB: Digit-Guided Prostate Biopsy; PSA: Prostate-Specific Antigen; Complications

Introduction

Prostate cancer is a hormone-dependent malignant tumor of the prostate with a slow evolution and with or without local or metastatic involvement. A prostate biopsy followed by a histopathologic analysis of the tissues sampled enables us to assert the diagnosis with certainty. It is the most frequent cancer among men above 50, and it is an important problem in public health [1]. WHO states that each year accounts for about 543 thousand new cases for close to 200 thousand dead in the world [1]. In United States its yearly prevalence is 129.4 for 100,000 inhabitants that is 0.13% [2]. In France its prevalence in 5years was 1,085 for 100,000 that is closely 1.1% [3]. In Togo we have an estimate of 77.3 cases per year diagnosed at the setting of urology of the Teaching Hospital [4]. In Cameroon, prostate cancer represents 7.3% of all

cancers diagnosed in 2012 [5]. A study carried out at Dibombari showed that 1/511 (0.2%) of males aged 40 and above have prostate cancer [6]. The diagnostic orientation was made on the fact that suspicious rectal exams with a PSA above 4ng/ml are consistent with a biopsy puncture to do then a histopathologic analysis. There are many methods of sampling: echo-guided prostate biopsy (EGPB) and digit-guided prostate biopsy (DGPB) [5, 6]. Digit-guided prostate biopsy was commonly the best-known and mostly-used method in our context. But more and more with the availability of ultrasonographers equipped with endocavitary probes and specialist, echo-guided prostate biopsy are also conducted. In France prostate biopsies were first digit-guided, but less specific and with low outcomes. Nowadays EGPB is the choice method [7]. EGPB was the method of choice in the last study on biopsies made in Cameroon with 102 cases of cancer on 161 patients biopsied [8]. More and more EGPB are therefore performed in our context. To our knowledge few studies were done in Cameroon comparing these two methods of biopsy. Is DGPB as effective as EGPB? This is why we have set ourselves the goal of comparing digit-guided biopsy with echo-guided biopsy in the diagnosis of prostate cancer at Yaoundé Central Hospital and la Cathedral Medical Center. In order to compare these two sampling methods, we:

- Described the sociodemographic characteristics of our patients,
- Presented the clinical signs and histopathologic results of patients who had a prostate biopsy,
- Screened for the presence of prostatic tissue and for complications related to the method of sampling,
- Compared the rate of detection of prostate cancer related to the PSA, to the ultrasound and to the rectal exam.

Material and Methods

This is a descriptive, cross-sectional and retrospective study, which was carried out in 7 months duration. The period of study was five years, from January 2011 to December 2016, and the settings were the Urology Unit of Yaoundé Central Hospital and La Cathedral Medical Center.

Our population of study was made up of patients for whom a biopsy was requested due to a suspicion of a malignant lesion of the prostate. Were included in the study patients having an indication for prostate biopsy, patients with a prostate biopsy done (eventually with complications), and patients with histopathologic results available. All incomplete files were excluded from our study.

We made used of patients' files, data collecting forms and a computer for recording of information's collected. We applied and received the authorizations of the committees of ethics of the hospitals and the Faculty of Medicine of Douala. We classified our histologic results according to the type of biopsy performed.

For each case we gathered sociodemographic data, personal and family past medical history, clinical signs and symptoms of prostate cancer, and results of paraclinical work-ups (PSA, clotting, prostatic ultrasonography, data of the biopsy as well as its complications, the histologic report).

Patients had an indication for prostate biopsy under the basis of: a suspicious rectal exam, a PSA superior to 4ng / ml. Prostate biopsy was done for all such indications and pathology findings available. Files with incomplete records were excluded.

Data were recorded on a data sheet and then recorded in Microsoft Excel 2010. Data analysis was carried out using EPI info version 7 and SPSS version 20 software's.

We compared histologic results of patients having the same range of age, the same clinical signs, and the same PSA values but with different type of biopsy sampling. An assessment of the number of positive histopathologic results was made in each of the two prostate biopsy sampling and we determined which of the two sampling methods yields more complications. Quantitative variables were compared using the Student test. The comparison of qualitative data was done using the Chi-two test. Results were presented in tables and figures.

Results and Discussion

In this study we had 68 cases of cancer (64.15%). Among the 51 patients who had nodules on rectal exam, 43 (84.3%) had cancer.

Two hundred patient's files were sampled for this study. Ninety four were excluded due to some missing information; leaving us with a sample of a hundred and six (106) files. Fifty five (55) had echo-guided prostate biopsy (EGPB) and fifty one (51) had digit-guided prostate biopsy (DGPB).

- Age:

Patients' age range was 47-85 years with a median age was 65.02 year-old. This was concordant with the study of

Guegang G E et al. in Cameroun who in 2016 had a median age of 63.7 year-old.

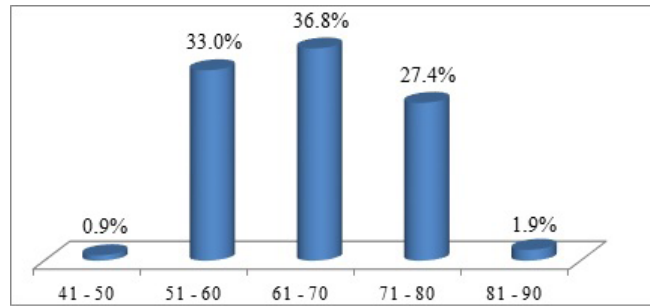


Figure 1: Patient's distribution according to the age

• Clinical and histopathologic data:

Eighty-four percent of our cases had nodule on exam with a positive histology, resulting in a P value of 0.001. This is concordant with the study of *Tenge K et al* in 2016 in Togo who found 81.9%, but it differs from *Cheick B et al* in 2013 in Mali had 35%.

Variables		Histopathologic results					P-value
		Positive	%	Negative	%	Total	
Presence of a nodule	Yes	43	84.3	8	15.7	51	100.0
	No	25	45.5	30	54.5	55	100.0

Table 1: Presence of a nodule on rectal exam and histologic result

We found 84.3% of positive pathologic results. This is similar to the study of *Sow et al* in 1998 in Cameroon who had 63.4% of positive cases, but it differs from *Bordier et al* in 2013 in France who had 46%. This can be due to the size of the sample of study which was 808 patients, that is ours multiplied by almost 8.

Variables		Type of biopsy sampling					P-value
		Digit-guided	%	Echo-guided	%	Total	
Result	Positive	26	51	42	76.4	68	64.2
	Negative	25	49	13	23.6	38	35.8
Total		51	100	55	100	106	100

Table 2: Prevalence of prostate cancer in relation to the type of biopsy

In our sample we found 68 cases of cancer with rate that was significantly higher on echo-guided 61.8% than in digit-guided 38.3% with a P-value of 0.006.

A similar remark was made by *Liddell et al* who found 98.8% on echo-guided and 60% on digit-guided with a P-value of 0.005. But it differs from the results of *Resnick M et al* who had 92.85% on digit-guided and 85.7% on echo-guided.

Gleason Score		Age				Total
		47-56	57-66	67-76	77-86	
	5	0	1	1	0	2
	6	2	5	7	0	14
	7	2	15	10	4	31
	8	2	0	3	1	6
	9	2	5	0	0	7
Total		08	26	21	5	60

Table 3: Gleason score related to the age

The Gleason score varied between 5 and 9. Only 16 patients had a Gleason lower than the average which was 6.39.

We sampled 6-14 carrots by echo-guidance versus 2-6 by digit-guidance. During the sampling another tissue than that of the prostate was often sampled. These carrots were of striated muscle and rectal mucosa. This was the case in 7.3% of echo-guided versus 13.7% of digit-guided.

We therefore state that it is easier to have sampling errors on the type of tissue in digit-guided than in echo-guided. And likewise digit-guided prostate biopsy is less precise as compared to echo-guided prostate biopsy.

Variables	Type of biopsy							
		Digit-guided	%	Echo-guided	%	Total	%	P-value
Other Tissue Type	Yes	7	13.7	4	7.3	11	10.4	
	No	44	86.3	51	92.7	95	89.6	
	Total	51	100.0	55	100.0	106	100.0	

Table 4: Type of tissue sampled related to the type of biopsy

Type of biopsy	Average number of positive samples	Min	Max	P-value (Student test)
Digit-guided (N=21)	3.0	1	5	0.001*
Echo-guided (N=41)	7.08	2	13	
Total	5.67	1	13	

Table 5: Number of cancer positive samples related to the type of biopsy

Echo-guided prostate biopsy: 6 to 14 samples

Digit-guided prostate biopsy: 2 to 6 samples

Garcia D et al concluded that a high number of punctured samples improve the likelihood to detect the cancer.

Variables	Type of biopsy puncture							P-value
		Digit-guided	%	Echo-guided	%	Total	%	
Bleeding	Yes	11	21.6	6	10.9	17	16.0	0.135
	No	40	78.4	49	89.1	89	84.0	
	Total	51	100.0	55	100.0	106	100.0	
Infection	Yes	6	11.8	2	3.6	8	7.5	0.113
	No	45	88.2	53	96.4	98	92.5	
	Total	51	100.0	55	100.0	106	100.0	

Table 6: Bleeding and infection after prostate biopsy depending of its type

Complications after biopsy were mainly hemorrhage and infection. Six out of 55 patients had post-biopsy bleeding in the echo-guided group versus 11 out of 51 in the digit-guided group. Three point six percent (3.6%) of echo-guided versus 11.8% of digit-guided had post biopsy infection. The most frequent complication after a biopsy was bleeding just as was confirming the study made by Sow et al.

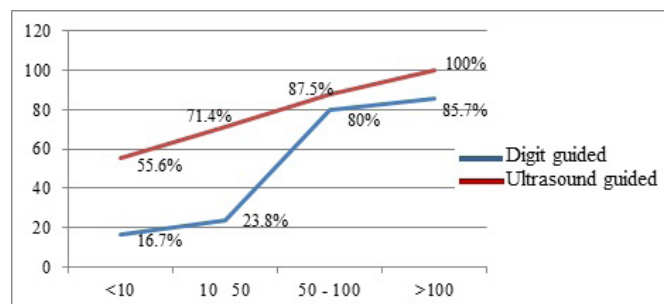


Figure 2: Rate of cancer related to the PSA

Our PSA value was ranging from 4-10ng/ml in 40% of cases and was above 10ng/ml in 76.4% of cases. This was different from the study of Touiti D et al 14 where it was respectively 39.3% and 13.9%. This was because the majority of patients in the later had a PSA inferior to 10ng/ml.

For a PSA <10ng / ml, between 10 and 50ng / ml, between 50 and 100ng / ml and > 100ng / ml were numbered respectively 5, 20, 7 and 10 echo-guided screened cancers versus 1, 5, 8 and 12 digit-guided screened cancers.

Variables	Histopathologic results						P-value	
	Positive	%	Negative	%	Total	%		
Bleeding	Yes	37	77.1	11	22.9	48	100.0	0.012*
	No	31	53.4	27	46.6	58	100.0	

Table 7: Prostate cancer related to the presence of nodules on echo

A similar remark is found relating the presence of a nodule on echo and the likelihood to have a positive result. Two of our cases had in the first place a digit-guided prostate biopsy then later an echo-guided prostate biopsy.

	Digit-guided	Echo-guided
	Number of samples	Number of samples
Patient 1	03	08
Patient 2	04	12

Table 8: Distribution of patients who had the two types of biopsy related to the number of samples

Nodule on rectal exam / PSA	Digit-guided	Echo-guided
	Result	Result
Patient 1 Yes / 118	Negative	Positive
Patient 2 Yes / 338	Negative	Positive

Table 9: Results of patients having done the two types of puncture

Limitations of this study

We faced some limits in our study due to the absence of data in some files and the difficulty in recovering the histologic results of some patients.

We had two patients for whom was done in the first place a DGPB then an EGPB. Both had nodular prostate on rectal exam and ultrasonography. During the DGPB and EGPB the PSA was the same. There is nevertheless a remarkable difference in the number of samples biopsied that was lesser in digit-guided than on echo-guided. Histology results were found all positive with EGPB while they were all negative with DGPB. This is explained by the fact that DGPB is a blind procedure. Meanwhile EGPB visualize the prostate and therefore enables to puncture as much samples as wished and also reduces the likelihood to miss the target.

Conclusion

The prevalence of prostate cancer is 64.15% and the median age of occurrence is 65.02 year-old more or less 7.7 years. The puncture of 10 to 12 prostatic core-samples improves the likelihood to detect a cancer. Echo-guided biopsy yields more specific results as compared to digit-guided. Echo-guided biopsy improves the detection of prostate cancer (P-value: 0.006), enables to have biopsy core-samples which are purely prostatic and yields lesser complications. Echo-guided biopsy is therefore the choice approach to screen for a diagnosis of prostate cancer and consequently to adequately follow-up the patient.

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