

Prostate Biopsy: Which Technique for Which Results at Lomé University Hospital in 2017?

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Abstract

Background: Diagnosis of prostate cancer is certified by histology true prostate biopsies. The aim of our study was to evaluate our prostate biopsy method. **Material and Methods:** It was a prospective study including patients underwent prostate biopsy. Inclusion criteria were prostate specific antigen (PSA) level up to 4ng/ml and/or abnormal prostate at digital rectal examination. Patients who had risk factors of bleeding have been excluded of the study. The preparation before biopsy included antibioprophyllaxy (Ciprofloxacin-Tinidazole) and rectal hypertonic cleaning (Normacol*). Twelve cores have been taken in each prostate by transrectal digital-guided way, using Biopsy Gun 18 Gauge. Local anesthesia has been done previously by intrarectal application of 20 ml of gel of Lidocaïne. Two other cores were taken into each abnormal area at rectal examination. The follow-up have been done during twelve weeks. **Results:** Eighty patients of 65 years of age were included. Nine patients had familial history of prostate cancer. PSA levels ranged from 5 to 6400 ng/ml with a median of 26.77 ng/ml \pm 11.2. Complications occurred in 11.25% of patients, principally infectious complications which caused death of one patient by septicemia. The rate of cancer detection was 20%. Prostate abnormality at digital rectal examination and the presence of familial history of prostate cancer were not predictive factors of the presence of cancer on cores. **Conclusion:** Our prostate biopsy method is limited by the lack of ultrasonographic guidance and is at important risk of infectious complications.

Keywords

Biopsy, Prostate Cancer, Digital Guidance, Infectious Complications

1. Introduction

Prostate cancer is now a real public health problem because of its ever-increasing prevalence [1]. The wide use of the prostate specific antigen (PSA) assay for screening has caused the incidence to explode in a general way. But the diagnosis of certainty is histological and is based on the analysis of prostate tissue samples generally obtained by biopsy. This prostate biopsy can be done mainly by two routes, the transrectal and the transperineal route. But whatever the route used, this procedure is burdened with fairly high morbidity and mortality that is not zero [2]. According to the recommendations for the good practice of prostate biopsies, 12 ultrasound-guided transrectal samples make it possible to optimize the detection of carcinomatous foci [3]. In our practice screening for prostate cancer is routine in any patient receiving urology and at least 50 years of age, and the biopsy specimen of the prostate is proposed in case of clinical and/or biological suspicion of neoplasia. It seemed important to know the impact of the prostate biopsy as it is performed in our practice on the detection of prostate cancer and the risks of this procedure. The aim of our study was to report the technique and results of a series of prostate biopsies and to analyze its interest in the diagnosis of prostate cancer.

2. Material and Methods

We conducted a 24-month prospective study (from January 2016 to December 2017) that included patients who had a prostate biopsy for the diagnosis of prostate cancer. The inclusion criteria were a total PSA level greater than 4 ng/ml [4] and/or a digital rectal abnormality. A biological assessment including blood crase and cyto bacteriological examination of urine (ECBU) was done for each patient. Patients who were at risk of bleeding (abnormal haemostasis, anti-coagulation) were excluded from the study, and those with bacteriuria greater than 10^5 /ml were treated with appropriate antibiotics before biopsy. Each patient received antibiotic prophylaxis beginning forty-eight hours before the biopsy, including 500 mg of ciprofloxacin and 400 mg of tinidazole every 12 h; the antibiotics were pursued after the biopsy for 48 h. A rectal preparation was administered to all patients and consisted of a Normacol enema* four hours before the procedure. Prostate tissue was sampled by transrectal way under local anesthesia by intrarectal administration of 20ml of lidocaine gel; the operator was the same for all patients. The puncture material was a Biopty Gun 18 G disposable forceps (Figure 1).

Twelve samples were systematically taken on each prostate, four at the base (including two on each lobe), four at the middle and four at the apex. Two additional samples were taken from any nodule or induration identified by digital rectal examination. Patient follow-up included an examination on day 1 (D1), D2, D7, D14 and D28 post biopsy; the monitoring elements included temperature, bleeding (hematuria, rectorrhagia, hemospermia), urine retention or any other clinical manifestation following the biopsy. For patients who have had one or more complications, hospitalization and adequate treatment have been



Figure 1. Biopsy Gun biopsy forceps for single use.

instituted. The total PSA assay was repeated 60 days after the biopsy if the histological examination showed no carcinomatous lesions. A second biopsy was offered to the patient if this control rate was greater than 4 ng/ml. The parameters studied were the age of the patients, the tolerance of the procedure (evaluated by the EVA visual analogue scale), the family history of prostate cancer, the initial total PSA level, the appearance of the prostate in the digital rectal examination, the result of the histological examination (histological nature of the tissue and Gleason score in case of malignancy), the post-biopsy complications, the post-biopsy PSA and whether or not a second prostate biopsy is performed and its result, as well as the detection rate after the first biopsy series and after the second series.

2.1. Statistical Analysis

The data was analyzed by Epi info version 3.5.4. The threshold of significance was represented by a p -value < 0.05 . Consent was obtained from all patients who participated in this study.

2.2. Ethical Consideration

This study received approval from the Head of the Urology department to be conducted. Since it was counting records, patient consent was not required. However during the counting and data collection patient names were not collected in order to preserve confidentiality.

3. Results

Out of a total of ninety-two patients, eighty met the criteria and were included in the study. Their median age was 65 years \pm 8.5 (52 years old and 85 years old). Nine patients had a family history of prostate cancer including seven first degree and two second degree. The initial total PSA level ranged from 5 ng/ml to 6400 ng/ml with a median of 26.77 ng/ml \pm 11.2. The detection rate of prostate cancer was 20% on the first series of samples and 33.3% on the second series which concerned only three patients. The abnormality of the prostate gland at the digi-

tal rectal examination was not a predictive factor for the presence of carcinoma on the biopsy samples and the presence of a family history of prostate cancer in the patient was not correlated with the histological results (**Table 1**). The patients' tolerance of the procedure was low; the pain was estimated at 7/10 on the visual analogue scale (VAS).

Complications occurred after prostate biopsy in 9 patients corresponding to 11.25%. These were mainly infectious complications (**Table 2**). We noted a death in a diabetic patient who had not observed antibiotic prophylaxis; the isolated organism was *E. coli* sensitive to quinolones. The death occurred two weeks after the biopsy despite appropriate antibiotic therapy.

Histologically, the adenocarcinoma had a variable level of differentiation, the distribution according to the Gleason score and the corresponding values of the PSA level are presented in **Table 3**. Mean PSA levels at one month and three months after biopsy were 80.78 ng/ml and 68.46 ng/ml, respectively.

4. Discussion

We analyzed the results of the digitally guided transrectal prostate biopsy performed in eighty patients through a prospective study. Complications occurred in the immediate aftermath in 11.25% of patients, mainly infectious complications and one death. The detection rate of prostate cancer in our series was 20%. The digital rectal examination abnormality was not significantly correlated with the risk of cancer detection on biopsy samples. The family history of prostate cancer had no correlation with the detection rate.

Table 1. Correlation between prostate cancer rates, Digital Rectal Examination (DRE) and Family History.

	Positive biopsy rate (%)	Negative biopsy rate (%)	<i>P</i>
Abnormal prostate at DRE	44.11 (15/34)	55.88 (19/34)	0.06
Normal prostate at DRE	2.17 (1/46)	97.82 (45/46)	0.01
Patients with a family history of prostate cancer (n = 9)	11.11 (1/9)	88.88 (8/9)	0.09
Patients with no family history of prostate cancer (n = 71)	21.12 (15/71)	78.87 (56/71)	0.1

Table 2. The different complications in the follow-up of the prostate biopsy.

	Type	Number	Percentage
Infectious complications	Acute prostatitis	6	7.50
	Orchi-epididymitis	1	1.25
	sepsis (death)	1	1.25
Hemorrhagic complications	Hematuria	1	1.25
Total		9	11.25

Table 3. Correlation between PSA and Gleason score.

	Gleason score	PSA average	PSA extremes (minimum - maximum)	Number (N = 16)
Undifferentiated tumor	8 (5 + 3)	6400	-	1
Medium differentiated tumor	7 (4 + 3)	522.71	42 - 2233	5
	7 (3 + 4)	98.24	-	1
	6 (4 + 2)	626.5	53 - 100	2
Tumor well differentiated	6 (3 + 3)	732.21	525 - 939.43	2
	5 (3 + 2)	30	-	1
	5 (2 + 3)	140.95	-	1
	4 (2 + 2)	807.11	34.3 - 2142	3

4.1. Procedure Limitations

The technique of digitally guided sampling in prostate biopsy has limitations related to the lack of precision in the choice of areas to be taken. Despite a grid of the gland, the cancer detection rate in our series was surely below what it could be if we had had imaging guidance. Indeed, the standard prostate biopsy technique currently accepted is transrectal guided echo sampling [3], even though the latter would ignore about 20% of prostate cancer that would have required treatment [4]. To overcome these shortcomings, new guidance techniques are currently being used, including Magnetic Resonance Imaging (MRI), which significantly increases the clinically significant cancer detection rate as reported by Futterer [5]. In our series the refusal of the majority of patients to undergo a second biopsy, related to the discomfort of the procedure including pain, reduced the number of cancer cases diagnosed in the second series. This second series of biopsies would surely have significantly increased the detection rate, given the permanent rise in PSA levels during follow-up.

4.2. Infectious Complications

Infectious complications were particularly common in our series despite antibiotic prophylaxis. The use of antibiotic therapy for surgery is questionable, but in the case of prostate biopsy it is a necessary precaution demonstrated by several studies [6] [7] [8] [9]. The discussion nevertheless lies in the modality of this antibiotic prophylaxis. In a series comparing the results of two groups of patients, one of which had taken a single dose and the second of multiple doses of a Ciprofloxacin-Metronidazole combination, authors reported a lower rate of bacteriuria in the multiple-dose group [10], but the rates of fever and sepsis were the same in both groups. A single dose would therefore be sufficient for the prophylaxis of prostate biopsy. The choice of molecules used in our series was based on the sensitivity of uropathogenic germs, even though recent publications reported increasing resistance of *Escherichia coli* to quinolones and particularly to ciprofloxacin [11]. Antibiotic prophylaxis of the prostate biopsy is important but

even more so in the patient with one or more risk factors, the risk of spread of a possible infection being indeed increased in case of weakened ground. In our study the diabetic patient died due to septicemia at the starting point of the prostate, this sepsis could certainly have been avoided if the doses of antibiotics had been taken in advance, but diabetes is currently considered to be one of the risk factors for quinolone resistance [12]. Antibiotic prophylaxis adapted to the result of rectal swab sampling would reduce the risk of infection [13].

4.3. Different Routes and Tolerability

Compared with the transperineal route, the transrectal route appears to provide less pain, but with a higher risk of rectorrhagia [14] [15]. In the series of Hara [16], no difference was noted in terms of pain manifestations between patients who had had a transrectal biopsy compared to those who had had a transperineal biopsy, but the anesthetic method used was spinal anesthesia. Perineal infiltration of xylocaine combined with periprostatic infiltration would not be sufficient in the transperineal approach, and authors reported that for this pathway the best options would be pudendal block, caudal block or spinal anesthesia [16] [17]. The use of intra rectal ice has been tested by some teams with benefits on the perception of pain [18] [19]. The maneuver was perceived as very painful in our series. This is explained by our procedure of anesthesia which seems less effective than the periprostatic block, as authors had reported [20] [21] [22]. This low tolerance has resulted in the majority of our patients refusing to undergo a second series of samples. It thus appears clear that ultrasound guidance, which allows at the same time achieving periprostatic anesthesia and identifying areas to collect allow us to ensure the comfort of our patients while keeping the ambulatory nature of the procedure.

4.4. Cancer Detection Rate

Our detection rate (20%) is lower than the rates reported in the literature [23] [24] [25] [26]. This difference is explained by our “blind” method which limits the detection of small non-palpable fireplaces DRE. Several devices are currently used to improve the targeting of suspicious prostate areas. Apart from ultrasound guidance, which is now the routine biopsy sampling technique [3], magnetic resonance imaging (MRI) has been described as to significantly increase the detection and especially high-risk cancers [27]. In our case, this exploration is not very accessible because of its high cost; it is realized only for patients with a strong economic power and after negative biopsy series with PSA levels always high.

The abnormality of the prostate on digital rectal examination was not a predictor of the presence of prostate cancer on the samples in our series. DRE had a high sensitivity and low specificity in our series, indeed among patients in whom the prostate was clinically normal up to 97.82% had a negative biopsy while only 44.11% of those whose prostate had malignancy had a positive biopsy. Rozet *et*

al. reported that a suspicious digital rectal scan was associated with a higher risk of undifferentiated tumor regardless of the value of PSA [28]. The low specificity of rectal examination in our patients can be explained by a high rate of chronic prostatitis. In fact lesions of chronic prostatitis were detected on about two-thirds of the samples. The presence in the patient of a family history of prostate cancer was not significantly correlated with the positivity of prostate biopsy, but this result is probably due to the weakness of our series.

5. Conclusion

Our study has highlighted the limitations and the high infectious risk of our prostate biopsy technique. Ultrasound guidance could increase the detection rate; the patient's preparation should be strengthened to significantly reduce the infections inherent in this procedure.

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