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ORIGINAL RESEARCH

Contribution of the transperineal prostatic biopsy: descriptive study of the first cases at the Hôpital Général Idrissa Pouye, Dakar

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Introduction: Prostate cancer is one of the most common malignancies among men aged over 50 years and the leading cause of cancer-related death in men after lung cancer. Diagnosis is done by transrectal or transperineal prostate biopsy with ultrasound guidance. While transrectal biopsy exposes the patient to infectious risk, a transperineal biopsy is an innovative technique with the advantage of limiting these risks and offering better anterior prostate sampling. It is replacing transrectal biopsy, known as the gold standard for prostate cancer diagnosis. Our study aims to describe the practice of transperineal prostate biopsy at Hôpital Général Idrissa Pouye (HOGIP), evaluate morbidity, and present the results.

Materials and methods: We conducted a descriptive, single-centre and cross-sectional study of patients who underwent a transperineal prostate biopsy at the urology department of HOGIP. We collected epidemiological, clinical, and paraclinical data. Analysis was done in Epi Info 7.2.5.0, and statistical significance was considered for $\alpha = 0.05$ and, therefore, a p-value < 0.05.

Results: The average age was 69 ± 7.60 years. Digital rectal examination was suspicious in 27 (66%) patients, and the median prostate-specific antigen (PSA) level was 24.525 ng/ml (interquartile range [IQR]: 18.39–67.43). The average visual analogue scale (VAS) for the pain rate was 3.6. Prostatic adenocarcinoma was diagnosed in 31 (76%) patients. Haematuria was the most frequent post-procedural complication observed in six (14.6%) patients. Two prostatitis cases were noted, and no cases of sepsis were reported.

Conclusion: Transperineal prostate biopsy contributes to reducing the number of post-procedural complications and provides better sampling of the anterior prostate than transrectal biopsy.

Keywords: transperineal prostatic biopsy, prostate cancer, endorectal ultrasonography, Senega

Introduction: Le cancer de la prostate est une affection maligne courante chez les hommes de plus de 50 ans et représente un problème de santé publique. Le diagnostique se fait par la biopsie prostatique par voie transrectale ou transpérinéale. Si la voie transrectale expose aux risques infectieux, la voie transpérinéale est une technique innovante qui a l'avantage de limiter ces risques et permettre un meilleur échantillonnage de la prostate antérieure. L'objectif de notre travail était de décrire la pratique de la biopsie prostatique transpérinéale au service d'Urologie de l'HOGIP, d'évaluer la morbidité et d'apprécier les résultats.

Matériels et méthodes: Nous avons mené une étude descriptive, monocentrique et transversale concernant les patients ayant subi une biopsie prostatique transpérinéale à HOGIP. Nous avons collectés des données épidémiologiques, cliniques, paracliniques et effectué les analyses sur Epi Info 7.2.5.0. La significativité statistique a été considérée pour $\alpha = 0.05$.

Résultats: L'âge moyen des patients était de 69 ans ± 7.60. Le toucher rectal était suspect chez 27 (66%) patients et la médiane du PSA était de 24.525 ng/ml. La moyenne de l'EVA était 3.6. L'adénocarcinome était diagnostiqué chez 31 (76%) patients. L'hématurie était la complication post-procédurale la plus fréquente, observée chez 6 (14.6%) patients. Deux cas de prostatite aigue étaient relevées et aucun cas de septicémie n'était signalé.

Conclusion: La biopsie prostatique par voie transpérinéale à l'avantage de réduire le nombre de complications post-procédurales tout en offrant un meilleur échantillonnage de la prostate antérieure contrairement à la voie transrectale.

Mots clés: biopsie prostatique transpérinéale, cancer de la prostate, échographie endorectale, Sénégal

Introduction

Prostate cancer constitutes a significant public health problem. It represents the most common cancer among the male population after lung cancer.[1] According to the 2020 report of GLOBOCAN, 4 919 895 men aged 50 and over have been diagnosed with prostate cancer during the last five years, representing a partial five-year prevalence of 22.7%.[1] According to estimates from the International Agency for Research on Cancer (IARC), 1 414 259 new cases were recorded worldwide in 2020 with an age-standardised rate equivalent to 30.7/100 000.[1]

Worldwide, North America, Oceania, and Europe have the highest incidence rates. Despite a slight increase in new cases of prostate cancer observed, Asia maintains the lowest incidence rates. In the United States, the American Cancer Society estimated 268 490 new cases and 34 500 deaths in 2022.[2] In Africa, among the most prevalent cancers in Nigeria, prostate cancer ranks first and is the leading cause of cancer-related deaths among men.[3] However,

epidemiological data related to prostate cancer across the African continent remain scarce and unreliable.

The diagnosis of prostate cancer is confirmed by prostate biopsy, mainly in the context of abnormal digital rectal examination/ an elevation of the PSA level. Transrectal biopsy has been the standard for several decades. Nonetheless, the risks and limitations of transrectal biopsies have led to a recent increase in transperineal prostate biopsies. Compared to transrectal biopsy, transperineal biopsy has the advantages of reducing the rate of infectious complications and better sampling of the anterior prostate. Despite these technical advances, transperineal biopsy is rarely performed in Africa. Our research aims to describe the practice of transperineal prostate biopsy at the urology-andrology department of HOGIP, identify complications, and present the results.

Materials and methods

We conducted a cross-sectional descriptive study at the urology department of HOGIP over three years, from February 25, 2020, to February 25, 2023. All patients who underwent a transperineal prostate biopsy during the study period were included. Before the biopsy, the patients were informed about the objectives of the procedure and potential complications. A careful history was taken before performing the biopsy to look for the use of anticoagulant and antiplatelet medications, among others. Diabetic patients received antibiotic prophylaxis with a single dose of ciprofloxacin before the biopsy.

The available multiparametric magnetic resonance imaging (MRI) was examined before the start of the procedure to identify any suspicious lesions, allowing better targeting at the time of sampling. The equipment used for the prostate biopsy, illustrated in Figure 1, was composed of a Flex Focus 500 Ultrasound Machine equipped with a Biplane 8808e endorectal probe for ultrasound guidance, a branded 22 mm 18 G disposable automatic biopsy gun, a PrecisionPoint™ Transperineal Access System, and lidocaine 1%. The patient was placed in the lithotomy position on the examination table. The scrotum was elevated using an adhesive strip, and the perineal skin was prepared with a chlorhexidine solution.

A rectal examination is aimed at assessing the volume and consistency of the prostate before the introduction of the ultrasound probe. Subcutaneous local anaesthesia is then performed by injecting 2.5 ml of 1% lidocaine (Xylocaine) twice on either side of the median raphe, approximately 1 cm anterior and lateral to the anterior anal margin. After waiting six minutes, the previously disinfected endorectal probe, then covered with a lubricated protective sheath, is introduced into the rectum and will make it possible to visualise the prostate, assess its dimensions, its echostructure, and make a correlation with suspicious lesions pre-identified on MRI (Figure 2).

The next step, once the PrecisionPoint™ Transperineal Access System is positioned on the probe, is to perform deep local anaesthesia with ultrasound guidance by injecting 1% lidocaine (Xylocaine) using a needle gradually advanced through the levator ani muscles of the pelvic floor and the periprostatic area, while taking care not to touch the urethra (Figure 2a). Five minutes after

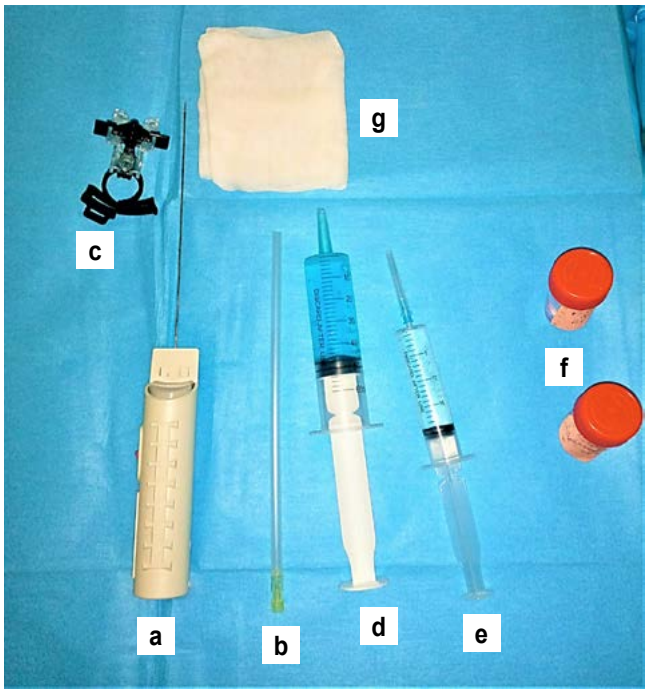

Figure 1: Equipment used to perform a transperineal prostate biopsy
a – Automatic gun topped with an 18 G needle
b – Needle 20 G/20 cm
c – PrecisionPoint™ Transperineal Access System
d – 60 ml syringe containing ultrasound gel
e – 20 ml syringe containing 1% lidocaine
f – Collection tubes
g – Gauze

deep local anaesthesia is achieved, the automatic gun is inserted through the PrecisionPoint™ Transperineal Access System to collect prostate cores (Figure 2b). Generally, six cores are taken from each prostatic lobe, including two anterior, two posterolateral, and two medial posterior locations.

The biopsy cores were fixed in 10% formalin contained in two tubes from the right and left lobes of the prostate, which was scrupulously identified and sent to the pathology department. At the end of the procedure, each patient was asked to give an overall score of the pain felt during the procedure on a VAS ranging from 0 to 10. Patient follow-up to identify post-procedural complications was subsequently carried out.

Statistical analysis was performed in Epi Info 7.2.5.0 with a statistical significance for $\alpha = 0.05$.

Results

During the study period, 52 patients underwent a perineal prostatic biopsy. We excluded 11 from this analysis, of whom two passed away, and nine were lost to follow-up. Finally, 41 patients met our inclusion criteria. The mean age was 69 ± 7.60 years (53–85 years). The most represented age groups were 65–70 and 71–76 years, with frequencies of 41.46% and 19.51%, respectively. Among the patients, 21 (51%) did not present with any comorbidity, while 14 (34%) patients were hypertensive, and six (15%) had type 2 diabetes.

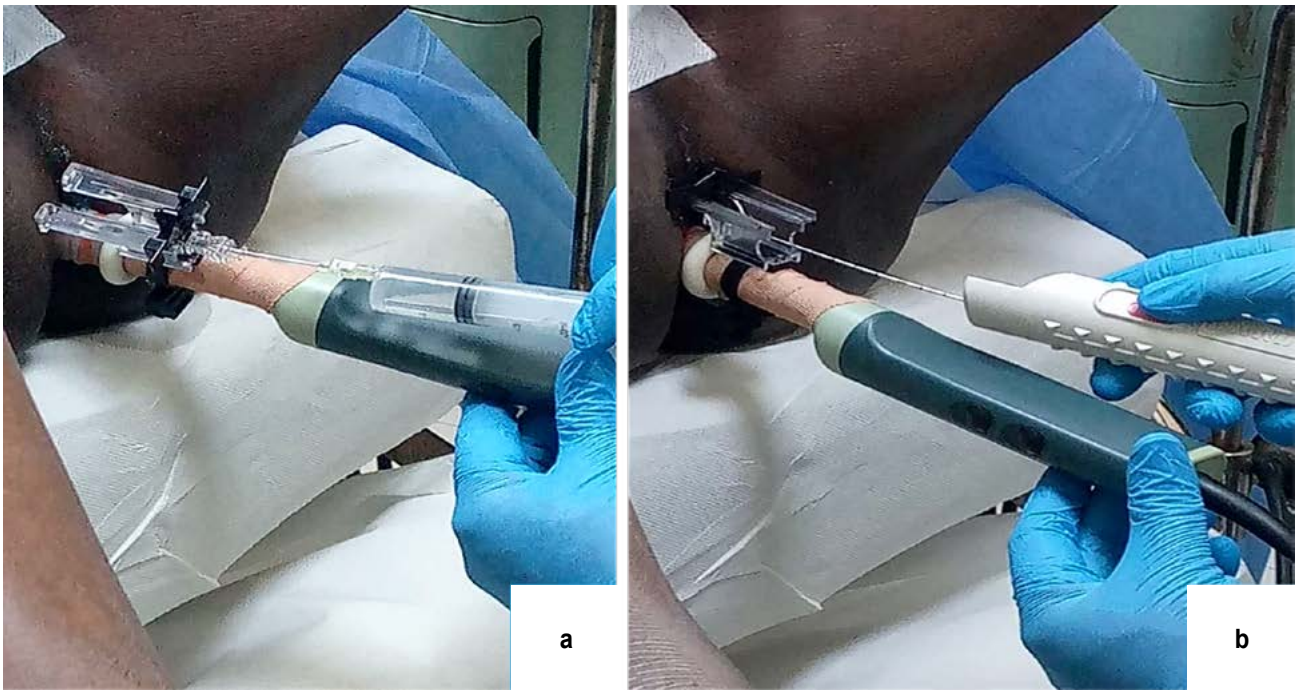

Figure 2: (a) Local anaesthesia at the level of the levator ani muscles and (b) the periprostatic space and collection of biopsy cores

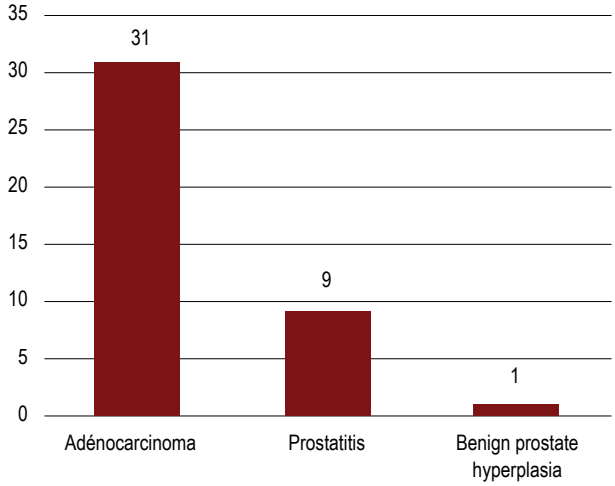

Figure 3: Distribution of patients according to histological type

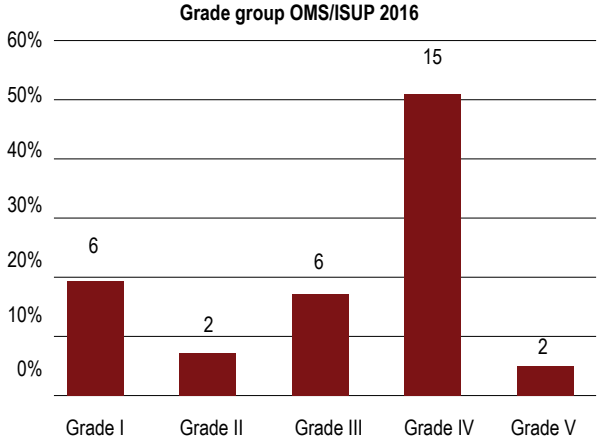

Figure 4: Distribution of patients according to the World Health Organization/ International Society of Urological Pathology (WHO/ISUP) 2016 grade group

Clinically, the most frequent reasons for referral were represented by urinary symptoms in 19 (46%) patients, followed by urinary retention found in eight (20%) patients. Rectal examination showed a suspicious prostate in 25 patients (61%). In 14 (34.15%) patients, there was an induration in one prostatic lobe. In nine (22%) patients, the induration concerned both prostatic lobes, and two patients presented with the appearance of a locally advanced tumour. The median PSA level was 24 525 ng/ml (IQR: 18.39–67.43). Multiparametric MRI was performed in seven (17.1%) patients, showing Prostate Imaging Reporting and Data System (PI-RADS) 5 lesions in three (42.8%) and PI-RADS 2 lesions in two (28.6%) patients.

Pain assessment during the transperineal biopsy showed a mean VAS value of 3.6. The VAS equalled 0 and 5 in 12 (29.27%) and 10 (24.39%) patients. Post-biopsy, 10 (24%) patients presented a complication, including haematuria in six (14.6%) patients, and two (4.8%) cases of acute prostatitis and required short-term hospitalisation.

Pathology showed acinar adenocarcinoma in 31 (76%) patients, prostatitis in nine (22%) patients, and benign hyperplasia in one (2%) patient (Figure 3). Among the adenocarcinoma cases, 18 (58%) were isolated, and five (16.1%) were associated with prostatitis. Of the adenocarcinomas, 22 (68%) were noted on both lobes, and 10 (32%) were noted on a single lobe. A Gleason score of 8 was noted in 18 patients and a score of 6 in five patients. The highest represented International Society of Urological Pathology (ISUP) grade was grade group IV in 58% of the 31 adenocarcinoma cases (Figure 4).

Discussion

Epidemiological, clinical and characteristics

In our study, the average age of patients was 69, ranging from 53 to 85 years. These results are consistent with studies carried

out in Asia.[5-9] Our average age is comparable with the findings of various European studies, which reported an average age of 69.[10-12] Zegarra-Montes et al.[13] also reported in their study carried out in Peru a similar average age of 69.33 years. These results could be explained by the fact that prostate cancer appears more frequently in men aged over 50, as shown by several studies carried out in the United States and Australia.[14-16]

In our series, 66% of patients had an abnormal digital rectal examination. Our results are lower than those of Yin et al.,[17] Sivaraman et al.,[8] and Zegarra-Montes et al.,[13] reporting respective rates of suspicious rectal examination in 72.43%, 84%, and 88.88%. The average PSA level was 214.55 ng/ml. Our average is higher than in several European studies, which varied between 7 and 9 ng/ml.[11,12,18,19]

Pain assessment during transperineal biopsy

The VAS is a simple and reproducible self-assessment pain scale used during our study to assess the intensity of pain patients felt during the transperineal biopsy under local anaesthesia. The average value of the VAS in our study series was equal to 3.6/10. Our results are superimposable to those of Chen et al.[6] and De Vulder et al.[10]

Morbidity

In our study series, haematuria was the most observed post-procedural complication, with a rate of 15%, and generally resolved within two days. Two cases of acute prostatitis leading to short-term hospitalisation were noted. Our results are similar to those of Pedersen et al.[12] and Guo et al.,[20] who found 17% and 19.8% haematuria rates during their studies. Our data is consistent with those of Marra et al.[21] and Sivaraman et al.,[8] who found that haematuria was predominant among the post-biopsy complications of the transperineal route.

Several studies comparing transrectal and transperineal biopsies show that the latter carries less risk of infectious complications.[6,15,22] During their respective retrospective studies, Meyer et al.[23] and Wetterauer et al.[24] had not identified any infectious complications. No cases of sepsis were reported in the series of Ristau et al.,[16] Kozel et al.,[19] Stefanova et al.,[25] or Kum et al.[26] Some studies report low rates of acute prostatitis in their populations.[15,27] No cases of sepsis were reported in our study, and only two cases of acute prostatitis were identified.

Prostate cancer detection rate

The detection rate of prostate cancer in our series was 76%. Chronic prostatitis and benign prostatic hypertrophy were present in 22% and 2% of patients, respectively. All prostate cancers detected in our series were adenocarcinomas. These results are consistent with those of Bass et al.,[28] who reported a detection rate of 78%. The same is true for Kum et al.[26] and Anract et al.,[29] who, in their studies, found a prostate cancer detection rate of 79%. Our results are in agreement with several previous studies, which found that the transperineal approach provides excellent detection of prostate cancer.[8,26]

The available literature uniformly shows that transperineal prostate biopsy can be performed on an outpatient basis under local anaesthesia using the PrecisionPoint™ device as an effective tool to facilitate its performance.[30] A descriptive study carried out in our urology department in 2021 on a cohort of 231 patients who underwent a transrectal prostate biopsy revealed a detection rate of prostate adenocarcinoma of 54%, lower than our study.[31] In their study on the transperineal approach in 1 287 patients, Stefanova et al.[25] also found a detection rate of 49.8% of prostate cancer, higher than reported in a study they had previously carried out on the transrectal approach in a similar population (42%). On the other hand, various other studies report that transrectal and transperineal approaches have the same diagnostic accuracy.[6,15,30,32,33]

Our work has limitations, notably the limited sample size and number of MRIs, which do not allow us to describe targeting techniques more precisely. Such techniques include in-bore prostate biopsy, in which case multiparametric MRI identifies suspicious lesions and guides the biopsy. The second option is cognitive fusion biopsy, which identifies suspicious prostatic lesions and targets them by ultrasound without the use of software. The use of software-assisted fusion adds more precision to the targeting by merging the findings of MRI, ultrasound and in-bore biopsy techniques within the context of prostate biopsies.[34] Despite these limitations, we have shown the feasibility of this technique and a good prostate cancer detection rate, while ensuring patient comfort and a limited complication rate.

Conclusion

Transperineal prostate biopsy constitutes an innovation that improves the quality of care for patients suffering from prostate tumours. It allows prostate biopsies to be performed while reducing the number of post-procedural complications and provides better sampling of the anterior prostate. In addition, it allows excellent detection of prostate cancer. The freehand technique performed using the PrecisionPoint™ Transperineal Access System facilitates the performance of the transperineal approach and so offers the possibility of performing transperineal biopsy more widely under local anaesthesia on an outpatient basis.

Conflict of interest

The authors declare no conflict of interest.

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Ethical approval

Ethical approval was obtained from the CNERS Senegal La Presidente Ethique et Scientifique (00000164 MSAS/CNERS/SP).

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