Complications secondary to transrectal ultrasound-guided prostate biopsy

P. Cruz García-Villa a,*, D. López-Alvarado a, H. Castellanos-Hernández b, M. Estrada-Loyo a, E. Monroy-Bolaños a and M. Schroeder-Ugalde a

a Urology Specialty Residency, Urology Service, Hospital Regional “Lic. Adolfo López Mateos”, ISSSTE, Mexico City, Mexico
b Uro-oncology Specialty, Hospital Regional “Lic. Adolfo López Mateos”, ISSSTE, Mexico City, Mexico

Abstract

Background: Transrectal ultrasound (TRUS)-guided prostate biopsy is a definitive procedure for diagnosing prostate cancer (CaP) and it can have complications.

Aims: To report the frequency of complications following TRUS-guided prostate biopsy.

Methods: An analytic, descriptive, retrospective, cross-sectional study of 245 patients having undergone TRUS-guided prostate biopsy was conducted.

Results: The mean age was 68 years and patients had a mean prostate-specific antigen (PSA) value of 20.2 ng/ml. They presented with hematuria for a mean 1.7 days and hematochezia for a mean 0.5 days. Mean prostate volume was 62.4 cc. A total of 35.6% of the patients had a positive malignancy result. Fever presented in 5.7% of the patients and hematospermia in 9.8%. A total of 69% of the patients presented with hematuria and 2.4% with acute urine retention.

Discussion: The use of antibiotics, dietary measures, and intestinal preparation ensures a low frequency of infectious complications with this method. Our results coincide with those reported on in the medical literature. The low frequency of complications makes it the method of choice for the definitive diagnosis of CaP.

Conclusions: TRUS-guided prostate biopsy is not innocuous. The use of prophylactic antibiotics has resulted in a low complication frequency rate for the procedure, making it the definitive diagnostic method for CaP.
Complications secondary to prostate biopsy

PALABRAS CLAVE
Biopsia; Próstata; Complicaciones; México.

Complicaciones secundarias a biopsia transrectal de próstata guiada por ultrasonido

Resumen

Introducción: La biopsia transrectal de próstata (BTRP) es el procedimiento definitivo para el diagnóstico de cáncer de próstata (CaP). La BTRP tiene posibles complicaciones.

Objetivo: Reportar la frecuencia de complicaciones posterior a la BTRP.

Material y método: Estudio transversal, analítico, descriptivo, retrolectivo con 245 pacientes con BTRP.

Resultados: Edad promedio de 68 años. Los pacientes tenían un antígeno prostático específico (APE) de 20.2 ng/mL. Presentaron hematuria 1.7 días y hematoquezia 0.5 día. El volumen prostático medio fue de 62.4 cc. El 35.6% tuvieron un resultado positivo para malignidad. Se presentó fiebre en el 5.7%, hemospermia en el 9.8%. El 69% presentó hematuria y el 2.4% retención aguda de orina.

Discusión: El uso de antibióticos, medidas dietéticas y preparación intestinal hacen que éste sea un método con baja frecuencia de complicaciones infecciosas. Nuestros resultados coinciden con lo reportado en la literatura médica. La baja frecuencia de complicaciones la hacen el método de elección, para el diagnóstico definitivo de CaP.

Conclusiones: La BTRP guiada por ultrasonido (USG) no es inocua. El uso de antibióticos profilácticos ha logrado una frecuencia de complicaciones baja. La BTRP es el método diagnóstico definitivo para el CaP.

Introduction

Early detection of prostate cancer (CaP) has greatly benefited from efforts of systematic detection, with the introduction of prostate-specific antigen (PSA) and the refinement of transrectal ultrasound (TRUS)-guided prostate biopsy techniques.¹

Taking into account the figures from the National Health Data System (SINAIS for its initials in Spanish), CaP in Mexico is the eighth cause of death in men above the age of 65 years, with 4,435 deaths from this pathology reported in 2007. In 2008, it was reported as the twelfth cause of death in men of all ages, representing 1.7% of the deaths in the male population. Of the total of deaths by cancer in the country, Mexico City holds first place with 478 deaths (15.7/100,000 inhabitants), followed by Jalisco with 473 (21/100,000 inhabitants), and the State of Mexico with 411 (12.2/100,000 deaths).²

TRUS-guided prostate biopsy is currently regarded as the criterion standard for CaP diagnosis in patients presenting with elevated PSA or abnormal digital rectal examination (DRE).

As with any procedure, TRUS-guided prostate biopsy is not free from complications.

An average of 250 TRUS-guided prostate biopsies are annually performed in our hospital, making it one of the most frequently carried out procedures in our daily clinical practice; therefore it is important to analyze its main complications in an effort to improve study and prevention protocols.

The aim of this study was to report the frequency of complications following TRUS-guided prostate biopsy performed at the Hospital Regional “Lic. Adolfo López Mateos” del ISSSTE.

Methods

From a total of 420 biopsied patients at our hospital, a cross-sectional, analytic, descriptive, and retrolective study was conducted on 245 patients that, after undergoing biopsy, answered a telephone questionnaire applied to investigate if there were any complications.

All the patients underwent TRUS-guided prostate biopsy with the same technique. Twenty-four hours prior to the procedure patients were given a liquid diet, and 12 and 6 hours before biopsy they were given an enema. They also received antibiotic prophylaxis of 500 mg oral ciprofloxacin every 12 hours for 3 days. They were informed as to alarm signs and symptoms and had open emergency room appointments.

The frequencies, means, standard deviations, and percentages of the results were analyzed using the IBM SPSS v. 19 program.
Results

Of the 245 patients that answered the questionnaire, the mean age was 68.4 ± 8.8 years with a 42 to 89-year interval. A total of 24.9% of the patients had a past medical history of high blood pressure and 10.6% presented with type 2 diabetes mellitus. A total of 14.3% of the patients had more than one comorbidity. The mean PSA was 20 ng/mL, with an interval of 3.3 to 273 ng/mL. The mean prostate volume measured by TRUS at the time of biopsy was 62.4 ± 31.7 mL. Unremarkable DRE was found in 77.4% of the patients at the time of biopsy, whereas some abnormality was suspected in 22.6% of the patients. The procedure was the first biopsy for 77.1% of the patients (189 cases), the second for 15.1% (37 cases), and the third for 6.9% (17 cases). Of the patient total (245 cases), 35.6% presented with positive malignancy in the biopsy (table 1).

In relation to the corresponding complication data, hematuria presented in 68.6% of the patients. The mean hematuria duration was 1.78 days with an interval of 0 to 20 days. Hematospermia presented in 9.8% (24 cases) and was second in frequency. Some type of symptomatology suggestive of a vasovagal reaction during biopsy presented in 8.6% of the patients. A total of 6.9% (17 cases) referred to hematochezia after biopsy that lasted a mean of 0.5 days. A total of 8.6% (21 cases) of the patients referred to difficulty in initiating micturition after TRUS-guided prostate biopsy and 2.4% (6 cases) presented with acute urine retention that required a bladder catheter. A total of 42% (103 cases) complained of dysuria after TRUS-guided prostate biopsy. The mean duration of dysuria was 1.5 days. According to the visual analog scale for pain, the mean score was 4.5 ± 2.6 points. A total of 2% (5 cases) of the patients said they self-medicated after the procedure (fig. 1).

Only 5.7% (14 cases) of the patients presented with fever, and only 2.9% (7 cases) required hospitalization for some reason. There were no cases of severe sepsis and no deaths related to the biopsy.

Discussion

In 2011, our group first published the results related to the frequency of complications due to prostate biopsy at our hospital. In the present study, we reported the results from a larger sample for the purpose of determining whether our figures remained the same or were modified (table 1).

TRUS-guided prostate biopsy is the procedure of choice for CaP diagnosis. Indications for performing prostate biopsy are the presence of elevated PSA or an increase in prostatic consistency or nodule upon DRE.

The utilization of TRUS of the prostate, first described by Watanabe in 1968, expanded to include its systematic clinical use with the advances in ultrasound technology and the introduction of sextant biopsy protocols, guided by the Hodge protocols in 1989. TRUS-guided prostate biopsy has been very widely used in the diagnosis of CaP. The procedure can be associated with significant morbidity in a small proportion of patients. Hemorrhagic complications are the most frequent, followed by infection presenting as simple urinary tract infection (1.2% to 11.3%) or complicated with fever (1.4% to 4.5%).

The mortality rate following a TRUS-guided prostate biopsy is estimated at 0.09%. Other much less frequent complications are acute urine retention and prolonged rectorrhagia.

<table>
<thead>
<tr>
<th>Table 1 Result comparison with a previous study</th>
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<tr>
<td>2011 (N=117)</td>
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<tr>
<td>Age</td>
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<td>High blood pressure</td>
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<td>Type 2 DM</td>
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<td>PSA (ng/mL)</td>
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<td>Prostate volume (mL)</td>
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<td>Negative for malignancy</td>
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<td>Acute urine retention</td>
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<td>Days with hematochezia</td>
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DM: diabetes mellitus; PSA: prostate-specific antigen.
In our study, hematuria was the most frequent complication, with a percentage of 68.6%, followed by hematospermia at 9.8%. In accordance with other studies, hematuria can present from 12% up to 60%, whereas hematospermia on average appears in 10%.3

Fever presented in 5.7% of the patients. The fact that we did not carry out control urine culture after the biopsy is a limitation of our study. Because of this, we cannot determine the precise number of urinary infections directly related to biopsy.

Following the recommendation of the American Academy of Urology regarding prophylaxis with fluoroquinolones prior to TRUS-guided prostate biopsy, we administered 500 mg of oral ciprofloxacin every 12 hours to all patients 2 days prior to the biopsy and 3 days after.8,9 Upon comparing our present results of fever after TRUS-guided prostate biopsy (5.7%) with the figures from our previous study (6%), we found that there was no increase in the clinical cases of infection, nor data that suggested resistance to ciprofloxacin use.10 We consider prior intestinal preparation to be useful in reducing infection. The mechanical sweeping of bacteria found in the rectum through the use of laxatives, promotes a reduction in the risk for infections from gram-negative bacteria.

A slight increase in the positive biopsy rate of 35.6% was striking in the present study. This result could be due to a certain bias, given that this study only included patients that answered the questionnaire, whereas in another study conducted by our group on 420 patients, the percentage of positivity was 33.8%, the same as in the study published in 2011.

TRUS-guided prostate biopsy is an adequate detection method because it is safe, accessible, ambulatory, and tolerable. The use of antibiotic prophylaxis and previous anesthesia makes it well tolerated by patients.

Despite taking all the precautionary measures for reducing the risks for infection and hemorrhage, they can still persist. Therefore, we believe that TRUS-guided prostate biopsy should only be performed when there is an indication justifying it. Likewise, the opportune suspension of anticoagulants or anti-platelet drugs, the absence of urinary infection, the initiation of antibiotic prophylaxis, and intestinal preparation are all factors that we feel are necessary for carrying out biopsy. It is also our opinion that those patients needing anticoagulant maintenance that have an increased risk for bleeding should be hospitalized to undergo biopsy. This way, there can be strict surveillance before and after the procedure.

Today there are recommendations and guidelines supported by different associations with respect to TRUS-guided prostate biopsy. However, we believe that the experience at each hospital and in each country can have variations and therefore it is important to carry out pertinent modifications to the protocol being used in order to offer the patient a procedure that has a minimum of risks and a maximum detection rate.

Conclusions

TRUS-guided prostate biopsy continues to be the definitive diagnostic procedure for CaP. Even though there is a risk for complications, their low percentage makes it a suitable and relatively safe method. When certain preventive measures are carried out, such as antibiotic prophylaxis, intestinal preparation, and the suspension of anticoagulants, the risk for complications is reduced.

Conflict of interest

The authors declare that there is no conflict of interest.

Financial disclosure

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References