

Clinical Application of Transrectal Ultrasound Guided Prostate Biopsy

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Abstract: Objective: To analyze the clinical application of transrectal ultrasound guided prostate biopsy. Method: 100 suspected prostate cancer patients admitted to our hospital from January 2019 to January 2021 were selected and underwent transrectal ultrasound guided prostate biopsy. Based on the pathological results of the surgery, the disease detection rate (such as benign prostatic hyperplasia, prostatic intraepithelial tumor, prostate cancer, atypical adenomatous hyperplasia, etc.), visual analogue scale (VAS) scores, and Complication rate (hematuria, urinary retention, fever, vasovagal reflex, etc.), diagnostic efficacy (sensitivity, specificity, diagnostic coincidence rate, misdiagnosis rate, missed diagnosis rate, negative predictive value, positive predictive value). Result: According to the surgical and pathological results, there were 33 cases of benign prostatic hyperplasia, 11 cases of prostatic intraepithelial tumors, 7 cases of prostate cancer, and 17 cases of atypical adenomatous hyperplasia. The patients undergoing transrectal ultrasound guided prostate biopsy included 33 cases of benign prostatic hyperplasia, 11 cases of prostatic intraepithelial tumors, 7 cases of prostate cancer, and 7 cases of atypical adenomatous hyperplasia, with a disease detection rate of 98% (98/100); The patient's VAS score is (2.13 ± 0.45) points, and the incidence of complications is 3% (3/100); The sensitivity of transrectal ultrasound guided prostate biopsy was 92.50% (30/33), specificity was 90.47% (57/63), diagnostic accuracy was 94% (94/100), misdiagnosis rate was 3.17% (2/63), missed diagnosis rate was 9.09% (3/33), negative predictive value was 95% (67/70), and positive predictive value was 92.85% (26/28). Conclusion Transrectal ultrasound-guided prostate biopsy for prostate cancer has high diagnostic accuracy, low incidence of complications such as hematuria and urinary retention, light pain and high application value.

Keywords: Transrectal Ultrasound Guidance; Prostate Puncture Biopsy; Prostatic Cancer

Introduction

Prostate cancer is a common malignant tumor of the male reproductive system, which seriously threatens male reproductive health and life safety. Through research, it has been concluded that prostate puncture biopsy is the gold standard for diagnosing prostate cancer, but the diagnostic effects vary depending on the approach. Traditional systematic 6-needle biopsy cannot fully meet the diagnostic needs of the disease, with a false positive rate exceeding 30.00%. Transperineal and transrectal ultrasound guided prostate biopsy is a common surgical approach for diagnosing prostate cancer. However, some scholars believe that the physiological structure of areas such as the apex and peripheral zone of the prostate is unique, which can easily lead to missed examinations. The risk of complications varies depending on the approach. Some scholars have pointed out that transrectal ultrasound guided prostate biopsy has a low risk of complications and high diagnostic efficiency. Based on this, this study conducted transrectal ultrasound guided prostate biopsy for suspected prostate cancer patients admitted to our hospital, and explored the application effect of this biopsy technique. The report is as follows.

1. Materials and Methods

1.1 General information:

Selecting 100 suspected prostate cancer patients admitted to our hospital from January 2019 to January 2021. Inclusion criteria: (1) Patients suspected of prostate cancer through comprehensive examinations such as serum prostate specific antigen (PSA), ultrasound, magnetic resonance imaging, and rectal digital examination; (2) The patient is aware of this study and agrees to participate in the study; (3) Patients who have the first onset of prostate cancer and meet the indications for prostate biopsy; (4) PSA>10ng/ml. Exclusion criteria: (1) Patients with other malignant tumors; (2) Patients with incomplete clinical data and extremely low treatment compliance; (3) Patients with a history of abdominal and urinary system operations; (4) Patients with language and cognitive impairments. 100 patients aged 47-96 (62.63 ± 4.18) years; The volume of the prostate is 40-96ml, (72.14 ± 12.32) ml. This study has been reviewed and approved by the Medical Ethics Committee of our hospital.

1.2 Method

100 patients underwent transrectal ultrasound guided prostate biopsy. The method was to stop the use of anticoagulants 3 days before the puncture and perform intestinal cleaning 1 day before the puncture. During the puncture, the patient remains in a left lying position, holding their knees and keeping their abdomen close to their knees, causing their buttocks to approach the edge of the bed. After the anesthesia takes effect, a digital rectal examination is performed first, followed by disinfection and rinsing of the perianal and rectal area with iodine. Scan the prostate with an ultrasound probe through the rectum to ensure the puncture point and path. Then, push the 18G puncture biopsy gun to the patient's prostate capsule, press the excitation button, take the biopsy tissue, and fix it in a glass bottle containing 10% formaldehyde solution. Disinfect again and systematically puncture 12 needles at the left and right lobes of the prostate. After surgery, patients are required to drink plenty of warm water and take antibiotics to maintain unobstructed bowel movements.

1.3 Clinical Observation Indicators

With the surgical and pathological results as the gold standard, the disease detection rate (benign prostatic hyperplasia, prostatic intraepithelial neoplasia, prostate cancer, atypical adenomatous hyperplasia, etc.), visual analogue score (VAS), complication rate (hematuria, urinary retention, fever, vasovagal reflex, etc.) Diagnostic efficacy (sensitivity, specificity, diagnostic accuracy, misdiagnosis rate, missed diagnosis rate, negative predictive value, positive predictive value). VAS score: Draw a 10cm straight line on an A4 sheet of paper, divide it into 10 segments, and mark them with "0-10". Have the patient select a value to represent their own pain, with a score of 0 indicating no pain; 1-3 points for mild pain; 4-6 points for moderate pain; A score of 7-10 indicates severe pain. Diagnostic efficacy: specificity=true negative / (true negative+false positive) $\times 100\%$; Sensitivity=True Positive / (True Positive+False Negative) $\times 100\%$; Misdiagnosis rate=false negative / (true positive+false negative) $\times 100\%$; Misdiagnosis rate=false positive / (true negative+false positive) $\times 100\%$; Diagnostic coincidence rate=(true negative+true positive)/number of cases $\times 100\%$; Positive predictive value=true positive / (true positive+false positive) $\times 100\%$; Negative predictive value=true negative / (true positive+false negative) $\times 100\%$.

2. Results

2.1 Calculate the disease detection rate of patients and display it through surgical and pathological results

The surgical and pathological results showed that there were 33 cases of benign prostatic hyperplasia, 11 cases of prostatic intraepithelial tumors, 7 cases of prostate cancer, and 17 cases of atypical adenomatous hyperplasia. The patients undergoing transrectal ultrasound guided prostate biopsy included 33 cases of benign prostatic hyperplasia, 11 cases of prostatic intraepithelial tumors, 7 cases of prostate cancer, and 17 cases of atypical adenomatous hyperplasia, with a disease

detection rate of 98% (98/100).

2.2 Statistical analysis of patients' VAS scores and incidence of complications

The VAS score of 100 patients was (4.23 ± 0.64) points; The incidence of complications was 3.00% (3/100), including 1 case of fever, 1 case of urinary retention, and 1 case of hematuria.

2.3 Statistical Diagnosis Effectiveness of Patients

The disease detection rate is 98% (98/100); The patient's VAS score is (2.13 ± 0.45) points, and the incidence of complications is 3% (3/100); The sensitivity of transrectal ultrasound guided prostate biopsy was 92.50% (30/33), specificity was 90.47% (57/63), diagnostic accuracy was 94% (94/100), misdiagnosis rate was 3.17% (2/63), missed diagnosis rate was 9.09% (3/33), negative predictive value was 95% (67/70), and positive predictive value was 92.85% (26/28).

3. Discussion

Transrectal ultrasound guided prostate biopsy is the gold standard for the diagnosis of prostate cancer, with simple operation, convenient material collection, short surgical time, and minimal trauma. Transrectal biopsy is a common detection method for this procedure, and some scholars believe that this puncture biopsy method has significant advantages in terms of approach, puncture method, number of puncture needles, and complications. The data obtained from this study shows that the disease detection rate is 98% (98/100); The patient's VAS score is (2.13 ± 0.45) points, and the incidence of complications is 3% (3/100); The sensitivity of transrectal ultrasound guided prostate biopsy was 92.50% (30/33), specificity was 90.47% (57/63), diagnostic accuracy was 94% (94/100), misdiagnosis rate was 3.17% (2/63), missed diagnosis rate was 9.09% (3/33), negative predictive value was 95% (67/70), and positive predictive value was 92.85% (26/28). This indicates that transrectal ultrasound guided prostate biopsy has an ideal diagnostic effect, and the patient has mild pain that can be fully tolerated. The author believes that the approach for transrectal ultrasound guided prostate biopsy is parallel to the patient's prostate, and it does not harm the prostate and does not require excessive puncture. At the same time, the number of puncture needles for this surgery is 12, which can fully obtain the pathological changes of the lateral and apical parts of the prostate, evaluate the distribution characteristics of the lesions, and reduce the missed diagnosis rate. With ultrasound assistance, physicians can effectively obtain biopsy tissue and ensure diagnostic effectiveness. The results of this study also showed that the incidence of complications in patients was 3.00%, indicating the high safety of transrectal ultrasound guided prostate biopsy. Although transrectal ultrasound guided prostate biopsy requires passing through the rectum before entering the prostate, the puncture speed is fast, the tissue obtained is very small, and there is less damage to the prostate. Providing appropriate antibiotics before and after surgery can effectively reduce the risk of infection. This operation does not need any special treatment during the operation, and the puncture covers a wide range. It can not only collect samples from various parts in time for saturation puncture, but also avoid urinary retention, vasovagal reflex and other complications, with good safety.

4. Summary

In conclusion, transrectal ultrasound guided prostate biopsy for prostate cancer has low incidence of complications such as hematuria and urinary retention, light pain, high diagnostic accuracy and high application value.

References

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