COMPLICATIONS OF TRANSRECTAL PROSTATE BIOPSY

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Abstract

Objective: The aim of our study is to evaluate complications in patients who underwent a Transrectal Ultrasound Guided Prostate Biopsy (TRUS BP) at the Department of Urology of JFM CU and UHM in 2007-2008 and at the Department of Urology in Bojnice Hospital in 2009-2012.

Methodology, disclosures: In our study, patients with positive digital rectal examination (DRE) and/or with higher prostate specific antigen (PSA) levels (>4 ng/ml) are included. We excluded patients with PSA levels greater than 50ng/ml, as well as patients with less than 8 biopsy cores. The number of examined patients fulfilling the criteria was 474. An average age of them was 66.3 years (SD±8.3years). As an antibacterial prophylaxis, the patients were given fluoroquinolons in a dose of 500mg twice a day during a 3-day course of antibiotics, while the first dose was given one day before the procedure. In high risk patients, we used a single intramuscular dose of gentamycin 160mg right before the procedure followed by fluoroquinolons for the next five days.

Results: The most severe complication was vasovagal reaction, which occurred in 9 (1.9%) cases. Haematuria occurred in 122 (25.7%) cases up to 3 days and in 10 (2.1%) patients up to 7 days. Six patients (1.3%) required hospital admission for severe haematuria. Dysuria occurred in 71 patients (15%). Rectal bleeding occurred in 90 (19%) cases with an average 2 days of bleeding, from which 7 patients were admitted to hospital and administered haemostyptics. From the mentioned count, 2 (0.4%) patients underwent a rectal tamponade and one (0.2%) patient with arterial bleeding underwent an arterial ligation of a stricken artery. Haemospermia occurred in 71 (15%) cases. 23 (4.9%) patients suffered fever above 38°C, within whom in 7 (1.5%) cases was microscopicaly proven urinary tract infection requiring hospitalisation lasting 7 days on average. Sepsis occurred in 3 (0.6%) patients, symptomatic bacterial prostatitis in 6 (1.2%) cases and urinary retention occurred in one (0.2%) patient. There was not any significant higher amount of complications in between 8-core and 10-core biopsy (P=0.26), not even in between 8-core and 12-core biopsy (P=0.32).

Conclusion: TRUS PB is a safe procedure with quite a low risk of complications. An important moment is a close monitoring right after the procedure. The most of the complications may persist for around two weeks and are treated conservatively without persistent effects. Prophylaxis with broad spectrum antibiotics may provide an adequate coverage and lowers the risk of infectious complications.

Key words: prostate biopsy, prostate cancer, complications, transrectal ultrasound

INTRODUCTION

TRUS PB is a basic and most common method in prostate cancer (PC) evaluation and diagnostics. The PSA levels (1) and DRE have a key role in an early diagnostics of the prostate cancer. Patients with a higher PSA levels and/or with suspicious findings on DRE are recommended the ultrasound guided biopsy. It is an invasive diagnostic procedure with a risk of infectious and other complications. PB can cause bacterial prostatitis, symptomatic urinary tract infection, fever, chills, as well as sepsis (2). Aerobic or anaerobic organisms may be introduced when performing the transrectal biopsy, the most common being Escherichia coli (3). Thus the use of broad spectrum antibiotics lowers the risk of infectious complications. Currently fluoroquinolones for three days are the antibiotics of choice in TRUS guided prostate biopsy (4).

In general we may say, that TRUS PB is a safe method and very well tolerated by patients. A mild haematuria, haematospermia, as well as transient rectal bleeding occur often, so

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that we may consider them as a result of procedure more than as an complication (5). Severe complications include urosepsis, severe rectal bleeding and haematuria requiring endoscopic treatment. It is recommended to check on the patient for a while right after the biopsy to prevent the severe rectal bleeding or significant haematuria.

MATERIAL AND METHODS

The study includes patients examined at the Department of Urology UHM in 2007-2008 and at the Department of Urology in Bojnice Hospital in 2009-2012, who were indicated for PB for positive DRE and/or higher PSA levels (>4 ng/ml). We excluded patients with PSA levels greater than 50ng/ml, as well as patients with less than 8 biopsy cores. The number of examined patients fulfilling the criteria was 474, while 186 (39.2%) were examined in Bojnice and 288 (60.8%) were examined in Martin. An average age of them was 66.3 ± 8.3 (SD) years.

We took, at least, 8 biopsy cores (Fig. 1a) from the peripheral zone at the prostate volume up to 40ml (62 patients – 13.1%), 10 biopsy cores (Fig. 1b) at the volume up to 60ml (296 patients – 62.4%) and 12 biopsy cores (Fig. 1c) at the prostate volume above 60ml (116 patients – 24.5%).

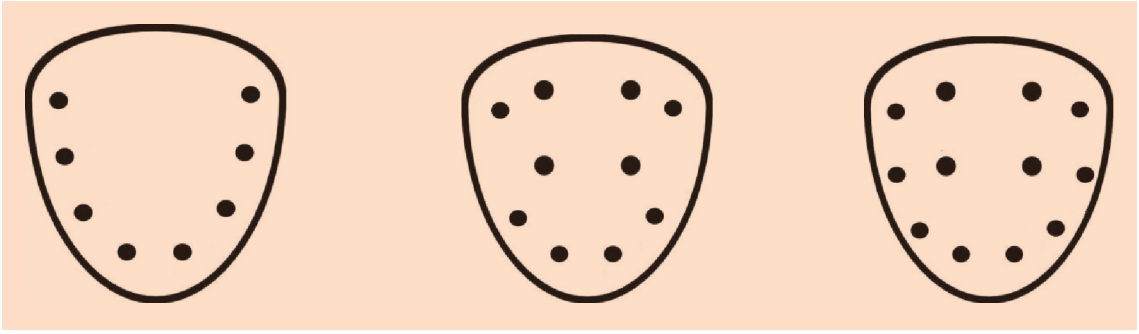

Fig. 1a Example biopsy locations in a 8-core PB

Fig 1b. Example biopsy locations in a 10-core PB

Fig. 1c. Example biopsy locations in a 12-core PB

Technique

DRE, as well as TRUS were provided by experienced senior urologists. TRUS examination in Bojnice was provided with Bruel – Kjaer Flex focus (Dennmark) and in UTH in Martin with Siemens Sonoline Adara (Germany) ultrasound devices. The biopsy was performed with a spring-driven needle core biopsy device – Magnum biopty gun 2.2 with a needle of 18G. The lenght of biopsy cores was 22mm on average. Every patient was carefully monitored at the department for 2 hours after the procedure. One week before the procedure, the NSAIDs and salicylates were discontinued and warfarine bypassed by low molecular heparines followed by the prothrombine time test. Urine culture was taken in patients with the Foley cathether and in case of positivity, followed by the broad spectral antibiotics use prior to the PB. We did not use the local anesthesia. Neither enema nor glycerine cion were used. Every patient was fully informed and signed the informed consent prior to the procedure.

Antibiotic prophylaxis

Quinolones (ciprofloxacin 500mg twice a day orally) were used one day before the procedure followed by their intake the next two days. In high risk patients (endocarditis, valvular protheses, diabetes mellitus), a single dose of gentamycin 160mg intramuscular was added, followed by five days cover of fluoroquinolones.

RESULTS

Prostate cancer was diagnosed in 233 (49.2%) cases out of 474 patients. Those, in whom PC was biopsy-verified, were older, an average age was 68.2 ± 8.5 (SD) years and had lower prostate volume (median = 33ml) in comparison to the age of those with negative PC finding 64.5 (SD 7.7) years and higher prostate volume (median = 40ml).

In 9 (1.9%) patients, a vasovagal reaction with bradycardia and hypotension occurred within 30 minutes after the biopsy and usually subsides up to 30 minutes spontaneously. Haematuria lasting up to 3 days occurred in 122 (25.7%) patients, up to 7 days in 10 (2.1%) cases. In 6 (1.3%) cases acute hospital admission was required and followed by administration of haemostyptics. Cathethrisation was required in one (0.2%) case. Rectal bleeding occurred in 90 (19%) patients with a history of days bleeding on average. Seven (1.5%) out of those were admitted to the department and administered haemostyptic therapy, two (0.4%) patients underwent acute rectal tamponade. One (0.2%) patient required endoscopic suture of a bleeding artery in a general anaesthesia. Haematospermia was reported in 71 (15%) cases. Dysuric disorders were reported in 71 (15%) cases. Fever above 38°C occurred in 23 (4.9%) patients and in 7 (1.5%) out of those urinary tract infection was proven microscopically (3x Enterococcus faecalis a 4x Escherichia coli), which required hospitalisation up to 7 days on average. Septicaemia was reported in 3 (0.6%) cases and required parenteral antibiotic cover. Symptomatic bacterial prostatitis was reported in 6 (1.2%) cases. In 3 (0.6%) of those an epicystostomy was provided and the therapy included antibiotics and alphablockers use. One (0.2%) case of urinary retention occurred. There was not a report of an epididymitis in our study.

The complications which followed TRUS PB are summarized in Table 1. The complications requiring hospitalisation are in Table 2).

Table 1. Complications following TRUS prostate biopsy (n = 474 patients)

Complication	Patient count (%)
Vasovagal reaction up to 30 min.	9 (1.9%)
Haematuria up to 3 days	122 (25.7%)
up to 7 days	10 (2.1%)
Haematospermia	71 (15%)
Rectal bleeding	90 (19%)
Dysuria	71 (15%)
Fever above 38°C	23 (4.9%)
Acute bacterial prostatitis	6 (1.2%)
Acute urinary retention	1 (0.2%)

Table 2. Complications of TRUS PB requiring hospital admission (n = 474 patients)

Complicaton	Patient count (%)
Severe haematuria	6 (1.3%)
Severe rectal bleeding	7 (1.5%)
Fever / urosepsis	7 (1.5%)
Surgical intervention	1 (0.2%)
Blood transfusion	1 (0.2%)

We have not reported any statistically significant higher occurrence of complications in between 8-core and 10-core biopsy (P=0.26), not even in between 8-core and 12-core biopsy (P=0.32).

DISCUSSION

Transrectal ultrasound-guided prostate biopsy is a safe and well-tolerated outpatient procedure. Nevertheless, it can be associated with early and late onset complications, which can be minor or severe, sometimes requiring hospital admission.

The early complications include procedural discomfort, transient rectal bleeding, haematuria as well as vasovagal syncope. Late onset complications include fever, dysuria, haematospermia and haematuria. In some series, TRUS PB is associated with a rate up to 80% of minor complications (5).

These results correspond with our case-study, in which 378 (79.7%) out of 474 patients mild complications occurred. Every patient must understand the potential complications of the procedure and discussed and assesed by a senior urologist.

The most frequent noted complication of TRUS-guided PB is bleeding, followed by the urinary tract infection. The infectious complications include symptomatic bacterial prostatitis, symptomatic urinary tract infection and urosepsis. Asymptomatic bacteriuria is not considered an infectious complication as long as it resolves itself spontaneously without any antibiotic use. Bleeding is the most common complication described in world case-studies. It occures in 4-74% cases of TRUS-guided PB, including the rectal bleeding in 2-40%, haematospermia in 15 up to 78% cases (5,6,7,8,9). Most of the cases do not require any surgical intervention and subside spontaneously. In our study, haematuria subsided spontaneously within three days, which corresponds with the world cases. In 6 (1.2%) cases, the haemostyptics were used to arrest the bleeding. In one (0.2%) case of the acute urinary retention a Foley cathether was inserted.

Likewise, Javorka et al. (9) evaluated sextant PB with prophylactic antibiotics cover (Ciprofloxacine 250mg) in 303 case-reports. Haematuria was reported in 31% cases, acute rectal bleeding in 21%, dysuria in 18%, haematospermia in 15% and fever in 6% cases. The bleeding, usually, subsided within 7 days, which is longer than in our case-study, in which it resolved itself among most of the patients (74.3%) within three days despite more biopsy cores.

In one patient of our case-study, the surgical treatment of bleeding was provided right after the biopsy procedure, which was not reported in above mentioned case-studies.

Table 3. shows the list of complications of PB mentioned in world case-studies. It is obvious, that the complication rate is very different in all the cases. The complication rate in our case-study corresponds with the world reports.

The relation between the number of biopsy cores and the complication rate was closely studied worldwide. The authors have not detected any statistically significant difference of increased complication rate respecting the increased number of cores (5,16,17). We conclude the same results in our case-study, respectively. We have not reported any statistically significant higher occurrence of complications in between 8-core and 10-core biopsy (P=0.26), not even in between 8-core and 12-core biopsy (P=0.32).

The periprocedural antibiotic prophylaxis intends to reduce the risk of local and systemic infectious complications. Alike in other procedures, it is prefarable to use a short-term regimen. These decrease the risk of side-effect of the antibiotics, bacterial resistance as well as the allergic reactions. It is prefarable to use antibiotics which are not administered in the common infection treatment. Extended antibiotic cover for more than 3 days has not proven any significant decrease of the infectious complications in comparison to the short-term regimen. The high risk patients with diabetes mellitus, immunosuppressed, with the history of bacterial prostatitis, recurrent urinary tract infections or

Table 3. Complications percentage given by biopsy session, irrespective of the number of cores, in world

Complication/Author	Peyromaure et al.[10] (n=275)	Collins et al.[11] (n=89)	Kirkels et al.[12] (n=1687)	Kreutzer et al.[13] (n=140)	Zisman et al.[14] (n=98)	Pushkar a Govorov [15] (n=612)	Javorka et al.[9] (n=200)	Cech et al. (n=474)
Haematuria	74.4%	58%	24%	55.6%	58%	35.9%	31%	27.8%
Haematospermia	78.3%	29%	45%	-	51%	27.1%	15%	15%
Fever above 38°C	3.7%	4%	4%	3.4%	5%	-	6%	4.9%
Dysuria	-	7%	-	29.9%	-	-	18%	15%
Rectal bleeding	-	37%	2%	-	40%	13%	21%	19%
Acute bacterial prostatitis	1.2%	-	-	-	-	3.6%	-	1.2%
Acute urinary retention	-	-	-	-	4.5%	1.5%	-	0.2%
Epididymitis	-	1%	-	-	-	1.1%	-	0

long-term cathethrised patients are exceptions. In these cases, the risk of infectious complications is significantly higher and antibiotic cover is provided for 5 days at least. For the urinary tract, the fluoroquinolones are the the most appropriate and efficacious. These maintain high efficacy, sufficient serum and tissue concentration without the need of redosing. They are rarely associated with allergic reactions and are not likely to promote bacterial resistance or side effects (18). In our group of patients, likewise in the other authors , cover of fluoroquinolones lasted 3 days, followed by the minimal amount of infectious complications (7.6%).

The prebioptis antibiotic prophylaxis include one- or three-day regimen (19,20). Aron et al. (21) published a comparative study, which revealed significantly lower incidence of infectious complications in patients covered by ciprofloxacine than in placebo. Very similar results were reported in one- or three-day regimen. Larsson et al. (22) revealed the high efficacy of 2 doses of ciprofloxacine 750mg combined with metronidazole 400mg. Infectious complications occurred in only 4.7% out of 289 patients. Scheaffer et al. (23) evaluated one-day and three-day slow-release ciprofloxacine cover. The 3-day regimen achieved significantly better results. Three-day antibiotic ciprofloxacine cover (2x500mg one day prior the procedure, followed by 2 days after the procedure), recommended by EAU Guidlines 2013 (4), is used in our departments respectively. The incidence of infectious complications in our group is relatively low and is comparable with other case-studies. It is obvious from the above mentioned, that the antibacterial propfylaxis is effective in preventing the incidence of infectious complications following TRUS-guided PB.

CONCLUSIONS

Transrectal ultrasound-guided punch prostate biopsy with standard minimum 10 core samples is a precise and reliable method of obtaining tissues of the gland to be examined microscopically for the presence of cancer. It is a safe procedure with a relative low risk of complications when the adequate periprocedural care is provided. The most important is a close monitoring right after the procedure. Most complications are treated conservatively without any persistant effects. The antibiotic prophylaxis is necessary since it lowers the risk of infectious complications.

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