An Update of the American Urological Association White Paper on the Prevention and Treatment of the More Common Complications Related to Prostate Biopsy

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Purpose: In this white paper update we identify and discuss the prevalence and prevention of common complications of prostate needle biopsy.

Materials and Methods: A literature review was performed on prostate biopsy complications via queries of PubMed and EMBASE® databases for prostate biopsy complications from January 1, 2010 until June 1, 2015. We focused on infection, bleeding, urinary retention, needle tract seeding and erectile dysfunction. A total of 346 articles were identified for full text review and 119 are included in the final data synthesis.

Results: Infection is the most common complication of prostate biopsy with fluoroquinolone resistant Escherichia coli having a prominent role. Reported rates of infectious complications range from 0.1% to 7.0%, and sepsis rates range from 0.3% to 3.1% depending on antibiotic prophylaxis regimens. Mild, self-limiting and transient bleeding is also a common complication. Other complications are extremely rare.

Conclusions: This white paper provides a concise reference document for the more common prostate biopsy complications and prevention strategies. Risk assessment should be performed for all patients to identify known risk factors for harboring fluoroquinolone resistance. If infection incidence increases check the local antibiogram, current equipment and cleaning practices, and consider alternate approaches to antibiotic prevention such as needle cleaning, risk basked augmentation, rectal culture with targeted prophylaxis and transperineal biopsy. If infection occurs, actively re-situate the patient and start empiric intravenous treatment with carbapenems, amikacin or second and third generation cephalosporins.

Key Words: prostate; biopsy; complications; infection; ultrasound, high-intensity focused, transrectal

Abbreviations and Acronyms

AUA = American Urological Association

PNB = prostate needle biopsy

TRUS = transrectal ultrasound

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TRANSRECTAL ultrasound guided prostate needle biopsy, the most common method of prostate cancer diagnosis, is the focus of this document, which provides an updated critical review of the literature addressing the incidence, etiology, risk factors, prevention and treatment of prostate biopsy related complications. The first AUA/SUNA (Society of Urologic Nurses Association) white paper on prostate biopsy complications was published in 2012 after recognition of the increase in biopsy infections.[1] The document was updated significantly to focus on the prevention and early treatment of complications, including an expanded discussion on infection, a summary of

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complications that could be used during informed consent as well as additional topics. Indications for prostate biopsy,[2] and the specifics of biopsy approach and tissue handling[3] have been published previously.

In this update we identify the prevalence of common complications of prostate biopsy to facilitate up-to-date informed consent and guide shared decision making, determine prevention strategies for common complications, recognize early signs of complications, and implement appropriate strategies to minimize patient morbidity and mortality.

MATERIALS AND METHODS

A literature review was performed on prostate biopsy complications by querying PubMed and Embase® databases for prostate biopsy complications from January 1, 2010 until June 1, 2015, with a focus on infection, bleeding, urinary retention, needle tract seeding and erectile dysfunction (table 1). After initial evaluation and multidisciplinary review of 346 articles, 119 were incorporated into the final complete document, which can be found at http://www.auanet.org/common/pdf/education/clinical-guidance/AUA-SUNA-PNB-White-Paper.pdf.[4]

RESULTS

Infection

One of the most common complications of prostate biopsy is infection, including urinary tract infection, prostatitis, epididymitis, orchitis, bacteremia and sepsis. Understanding the causes and implementing strategies for prevention and prompt treatment are imperative to prevent hospitalization, prolonged antibiotic therapy and secondary adverse sequelae. The most common cause of infection after transrectal prostate biopsy is fluoroquinolone resistant Escherichia coli.[5] Bacteria causing infection are found in the rectum before biopsy and are seeded into the prostate, bladder and/or bloodstream by the hollow core biopsy needle traversing the rectum into the prostate/bladder. Cultures obtained from the rectum immediately prior to biopsy have demonstrated a fluoroquinolone resistant colonization rate of 10% to 22%, and a fourfold increased risk of infection has been noted in men colonized with fluoroquinolone resistant organisms.[6–8]

Possible risks of prostate biopsy and frequency

	% Risk
Infection:	5–7
Hospitalization	1–3
Bleeding:	
Hematuria (% intervention)	50 (less than 1)
Rectal (% intervention)	30 (2.5)
Hematospermia (% greater than 4 wks)	50 (30)
Lower urinary tract symptoms (transient ~1 mo)	6–25
Urinary retention	0.2–2.6
Erectile dysfunction (transient ~1 mo)	Less than 1

Infectious complications from transrectal prostate biopsy have increased in recent years with rates ranging from 0.1% to 7.0% and sepsis rates ranging from 0.3% to 3.1% depending on antibiotic prophylaxis regimens and background antibiotic resistance in various geographic locations.[9–12] The overall risk of hospitalization after prostate biopsy was 1.9% in a study of 75,000 Canadian patients undergoing prostate biopsy, and more than 70% of those hospitalizations were related to infection, with a fourfold increased incidence during the 10-year study period.[12] Another follow-up study of more than 17,000 U. S. Medicare patients from 1991 to 2007 revealed a 1.1% risk of hospitalization after prostate biopsy.[10] Considering hospitalization after transrectal prostate biopsy has been estimated at $5,800 per event, infection can have a substantial impact on costs of care.[13] The most common and consistent risk factor for post-prostate biopsy infections is exposure to antimicrobials within 6 months prior to biopsy, which may promulgate the presence of resistant organisms. Additional risk factors are listed in Appendix 1.

Bleeding

Bleeding complications are common negative sequelae of TRUS guided PNB but most events are mild, self-limiting and transient. Rates of rectal bleeding are impacted by the number of biopsy cores and anticoagulation. A self-reported scale used in 1 study revealed that 36.8% of patients had blood in the rectum after TRUS guided PNB but only 2.5% considered it a moderate/major problem.[14] Hematospermia occurs following TRUS guided PNB with reported rates of 1.1% to 93%.[15] In the ERSPC (European Randomized Study of Screening for Prostate Cancer) trial hematospermia was observed in approximately half of the patients with associated risk factors being age, prostate volume and prior transurethral resection of the prostate.[16] Unlike other bleeding complications of TRUS guided PNB, hematospermia can persist for a longer duration. Manoharan et al highlighted an 84% rate after 1 week with gradual decline to 66% at 2 weeks and 32% still present at 4 weeks.[17]

Urinary Obstruction/Retention

Urinary retention is an uncommon complication that occurs early after prostate biopsy. This risk increases with a greater number of biopsy cores, specifically with transperineal procedures incorporating more than 24 cores. An increasing ratio of transition zone-to-total prostate volume is associated with risk of urinary retention after biopsy.[18,19] Observational studies suggest transient worsening of lower urinary tract symptoms, including rates of dysuria ranging from 6% to 25%.[20]