Catastrophic sepsis and hemorrhage following transrectal ultrasound guided prostate biopsies

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Abstract

We report 2 cases of catastrophic complications following routine transrectal ultrasound guided prostate biopsy. The first patient incurred near-fatal septic shock due to multi-resistant *Escherichia coli*. Due to the severity of his shock, he developed bilateral leg gangrene requiring amputations. The second patient incurred significant hemorrhage eventually requiring an emergent general anesthesia and surgical management to control hemorrhage after other measures failed. While rare events, these reports emphasize the caution needed for physicians who routinely order prostate biopsies.

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Case 1

A 63-year-old diabetic underwent transrectal ultrasound (TRUS)-guided prostate biopsy for an elevated PSA of 5.7 ng/mL and no findings on digital rectal examination (DRE). His past medical history included coronary bypass surgery, dyslipidemia and previous hospital admission for bronchitis. He smoked half a pack of cigarettes per day for 25 years.

The day prior to his biopsy, he was initiated on ciprofloxacin 500 mg orally, 2 times a day. The night after his biopsy, he presented to the emergency room with a fever, chills, pain and breathlessness. He appeared septic, with a systolic blood pressure of 75 mmHg, temperature 39º C. Initial white blood count (WBC) was 1.1, with a critically low neutrophil count of 0.44. He was given fluids, ceftriaxone and flagyl in the emergency room. Subsequently, he was transferred to the intensive care unit (ICU) and started on ionotropes and empiric meropenem. He developed hypoxia and was intubated and sedated.

During the first 4 days of admission, he continued to be unstable and hypotensive requiring ionotropic support and developing shock liver and renal failure. Solucortef and caspofungin were started; he also received a dose of amikacin. His WBC peaked at 42 on the fourth day of admission. Platelets remained very low at 21 and his international normalized ratio (INR) increased from normal to 2.13. Multi-resistant *Escherichia coli* was cultured from his blood and was initially only sensitive to amikacin, but eventually also found to be sensitive to meropenem.

Against expectations, he survived and slowly recovered. A tracheostomy was performed, and he was eventually weaned off ventilation. As a result of his severe sepsis, he developed bilateral feet gangrene requiring bilateral below knee amputations. Further, he incurred ototoxicity requiring hearing aids. His thrombocytopenia, renal and liver failure resolved over time. He was in the ICU for a total of 46 days and in hospital for 85 days.

His prostate biopsy did not show any evidence of malignancy.

Case 2

A 65-year-old pediatrician was sent for a TRUS biopsy of the prostate for a prostate-specific antigen (PSA) of 10.56 mg/L and a suspicious DRE. His medical history included coronary artery disease with previous coronary artery bypass grafting, hypertension and hypercholesterolemia. He had a mitral valve annuloplasty for mitral regurgitation. He experienced bleeding at the biopsy site immediately after the procedure which was packed. His bleeding improved and he was discharged.

However, he presented to the emergency department 9 days later with further rectal bleeding, passing bright red blood per rectum. On admission, he was hemodynamically stable with a hemoglobin of 104, INR 1.0, and prothrombin time 22.

After bleeding persisted for 2 days, a colonoscopy was undertaken. The colonoscopy showed several small non-bleeding hematomas around the biopsy site, but no active site could be identified. No proximal bleeding source was seen. Angiography showed that a branch of the superior hemorrhoidal vessels was slowly bleeding. This was tamponaded with a Foley catheter inflated per rectum. Later that same day, however, he had a recurrent rectal bleed and became hypotensive. His hemoglobin nadir was 56.

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After resuscitation, it was decided to transfer him to the operating room for surgical exploration. Under general anesthesia, his biopsy site was examined transrectally showing a general, slow ooze of blood. Several sutures were placed through this area to control the bleeding, and the rectum was then packed with Gelfoam.

Postoperatively, he was taken to the intensive care unit with pulmonary edema. requiring intubation. He was hemodynamically stable and was extubated 2 days later. However, he did develop a fever and elevated troponin levels. He was empirically treated with antibiotics and diagnosed with a non Q-wave myocardial infarction, but given only ticlopidine due to bleeding concerns. He slowly recovered and was discharged 15 days after admission.

Results of his biopsy confirmed Gleason 7 prostate cancer.

Discussion

These exceptionally catastrophic case reports from one surgeon's experience highlight that even from a routine procedure, severe complications can result. Nonetheless, it is difficult to quantitate such rare events and further to convey the risk appropriately to patients prior to a prostate biopsy.

Clearly neither patient expected to encounter such a life-threatening calamity as a result of his biopsy. Nor should a typical patient be fearful of such a rare complication. However, as urologists, we should take caution as it is easy to become desensitized to the potential risks to our patients.

A review of the literature suggests the risk of urinary sepsis following transrectal prostate biopsy to be 0.1% to 0.3%.[1,2] There appears to be an increasing prevalence of *E. coli* resistant to ciprofloxacin in patients presenting with serious infections following prostate biopsy.[3,4] Reports of fluoroquinolone resistance rates range from 1.2% to 23%, with rates reportedly higher in centres outside North America.[5] Nosocomial exposure and duration of the exposure to fluoroquinolones appear to be related to the incidence of resistance.[5-7]

With good tissue penetration and randomized trials supporting its benefit, ciprofloxacin is our choice of prophylactic agent for TRUS-guided prostate biopsy.[8,9] No difference between a prophylactic single dose administration and a 3-day course has been noted, but these studies are likely underpowered.[7-10] A longer course is probably warranted in men with risk factors.[11] Alternative choices to attempt to cover the common organisms *E. coli, K. pneumoniae, P. aeruginosa* and *Enterococcus* include another fluoroquinolone, a second or third generation cephalosporin or gentamicin.[5,12] There is no good evidence supporting the use of metronidazole.[12]

Significant rectal bleeding has been reported at an incidence of 0.1% to 1%.[1,2,13] The incidence of bleeding complications has not been shown to increase with either coumadin use or with the use of acetylsalicylic acid.[14,15] Our approach to managing significant or massive bleeding is to initially apply pressure to contain the bleeding or tamponade using an inflated Foley catheter in the rectum. Urinary retention is a common complication. Endoscopic intervention occurs only in severe cases; we know of no other cases which required general anesthesia for definitive management.

The cohort of patients undergoing prostate biopsy has evolved over the years to include more extensive biopsy patterns as well as older patients, including those who have routinely repeated biopsies as part of active surveillance of prostate cancer. It is intuitive that the incidence of significant bleeding and sepsis increases with the number of cores taken.[2]

Reports of death following routine prostate biopsy have been reported,[16] but none in Canada. Two other Canadian near-death complications have been published.[3,17] Other rare but serious complications following prostate biopsy reported in the literature included meningitis,[18] epidural abscess[4] and acute endocarditis.[19] At our institution, approximately 7000 biopsies are performed yearly. Both of these cases occurred over the last 6 years, suggesting that the risk of such episodes is perhaps 1 out of 50 000. However, we do not really know the true incidence of such events; routine database monitoring of all prostate biopsies is needed to monitor safety, particularly with the development of multi-resistant organisms.

With the recent publishing of the American and European prostate cancer screening trials[20,21], concerns about the overtreatment of prostate cancer are again being discussed. It is important to recognize that the risks of screening also extend to those undergoing biopsies who are never found to have cancer. Consideration of such risks needs to be incorporated into the clinician's algorithm of management of PSA screening.

Conclusion

While rare events, these reports remind us that serious complications can occur as a result of TRUS-guided prostate biopsy. It is important for clinicians to be aware of the risks when advising initial and repeat biopsies in patients. Further research needs to be done to evaluate the prevalence of drug resistance and to select an optimal prophylaxis regimen.

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References

1. Djavan B, Waldert M, Zlotta A, et al. Safety and morbidity of first and repeat transrectal ultrasound guided prostate needle biopsies: results of a prospective European prostate cancer detection study. *J Urol* 2001;166:856-60.
2. Sieber PR, Rommel FM, Theodoran CG, et al. Contemporary prostate biopsy complication rates in community-based urology practice. *Urology* 2007;70:498-500.
3. Weber B, Saliken J, Jadavji T, et al. A near-fatal case of sepsis with an antibiotic-resistant organism complicating a routine transrectal prostate biopsy in a health care worker. *Can Urol Assoc J* 2008;2:543-5.
4. Fradet V, McCormack M, Perrotte P, et al. An epidural abscess following transrectal ultrasound-guided biopsies of the prostate. *Can J Urol* 2005;12:2899-900.
5. Young JL, Liss MA, Szabo RJ. Sepsis Due to Fluoroquinolone-resistant Escherichia coli After Transrectal Ultrasound-guided Prostate Needle Biopsy. *Urology* 2009;74:332-8.
6. Kamdar C, Mooppan UM, Gulmi FA, et al. Multi-drug-resistant bacteremia after transrectal ultrasound guided prostate biopsies in hospital employees and their relatives. *Urology* 2008;72:34-6.
7. Briffaux R, Coloby P, Bruyere F, et al. One preoperative dose randomized against 3-day antibiotic prophylaxis for transrectal ultrasonography-guided prostate biopsy. *BJU Int* 2009;103:1069-73.
8. Roach MB, Figueroa TE, McBride D, et al. Ciprofloxacin versus gentamicin in prophylaxis against bacteremia in transrectal prostate needle biopsy. *Urology* 1991;38:84-7.
9. Aron M, Rajeev TP, Gupta NP. Antibiotic prophylaxis for transrectal needle biopsy of the prostate: a randomized controlled study. *BJU Int* 2000;85:682-5.
10. Cam K, Kayikci A, Akman Y, et al. Prospective assessment of the efficacy of single dose versus traditional 3-day antimicrobial prophylaxis in 12-core transrectal prostate biopsy. *Int J Urol* 2008;15:997-1001.
11. Aus G, Ahlgren G, Bergdahl S, et al. Infection after transrectal core biopsies of the prostate—risk factors and antibiotic prophylaxis. *Br J Urol* 1996;77:851-5.
12. Burden HP, Ranasinghe W, Persad R. Antibiotics for transrectal ultrasonography-guided prostate biopsy: are we practising evidence-based medicine? *BJU Int* 2008;101:1202-4.
13. Brullet E, Guevara MC, Campo R, et al. Massive rectal bleeding following transrectal ultrasound-guided prostate biopsy. *Endoscopy* 2000;32:792-5.
14. Herget EJ, Saliken JC, Donnelly BJ, et al. Transrectal ultrasound-guided biopsy of the prostate: relation between ASA use and bleeding complications. *Can Assoc Radiol J* 1999;50:173-6.
15. Ihezue CU, Smart J, Dewbury KC, et al. Biopsy of the prostate guided by transrectal ultrasound: relation between warfarin use and incidence of bleeding complications. *Clin Radiol* 2005;60:459-63.
16. Borer A, Gilad J, Sikuler E, et al. Fatal Clostridium sordellii ischio-rectal abscess with septicaemia complicating ultrasound-guided transrectal prostate biopsy. *J Infect* 1999;38: 128-9.
17. Al-Otaibi MF, Al-Taweel W, Bin-Saleh S, et al. Disseminated intravascular coagulation following transrectal ultrasound guided prostate biopsy. *J Urol* 2004;171:346.
18. Erdogan H, Ekinci MN, Hoscan MB, et al. Acute bacterial meningitis after transrectal needle biopsy of the prostate: a case report. *Prostate Cancer Prostatic Dis* 2008;11:207-8.
19. Irani J, Roblot F, Becq Giraudon B, et al. Acute bacterial endocarditis secondary to transrectal ultrasound-guided prostatic biopsy. *Scand J Urol Nephrol* 2002;36:156-7.
20. Schroder FH, Hugosson J, Roobol MJ, et al. Screening and prostate-cancer mortality in a randomized European study. *N Engl J Med* 2009;360:1320-8.
21. Andriole GL, Crawford ED, Grubb RL 3rd, et al. Mortality results from a randomized prostate-cancer screening trial. *N Engl J Med* 2009;360:1310-9.

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