VERTEBRAL OSTEOMYELITIS AFTER PROSTATE CANCER SCREENING

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May 12, 2017
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Case:

A 66 year old man with a history of hypertension, prostate cancer (diagnosed 4 years ago) and multiple vertebral surgeries for vertebral osteomyelitis presents to clinic for an establish care appointment. He is feeling "great" in clinic today and has no complaints. He was diagnosed with hypertension at age 41 and has been on Lisinopril 10mg daily since then. His BP is well controlled today. He has never been on medications for prostate cancer since based on his last biopsy is still a stage 1 with Gleason score of 3+2 (Well differentiated). About 4 years ago, he had a PSA lab test as part of routine lab work and it was elevated at 7. He underwent transrectal ultrasound guided prostate biopsy. About 10 days later he was admitted with fevers, nausea, vomiting and back pain and was found to have E. coli septicemia. The source was later identified to be vertebral osteomyelitis. As a result he underwent 3 vertebral surgeries over the next year and a half and required long term IV antibiotics. Fortunately, he is doing well today other than the occasional back pain which he take over the counter Tylenol to relieve. He has had prostate biopsies since his initial biopsy that demonstrate stable disease, as such he has not been started on any medications and has opted not to have a radical prostatectomy.

Prostate biopsies:

Transrectal ultrasound-guided needle biopsy of the prostate (TRUS) is the mainstay of diagnosis of prostate cancer. More importantly, it is used to differentiate indolent forms (the majority) from aggressive forms of cancer. As in the case above, vertebral osteomyelitis is potential complication of prostate cancer biopsy. One proposed pathophysiologic mechanism of developing vertebral osteomyelitis following prostate biopsy is Hematogenous spread from transient bacteremia. However, some also propose spread from contiguous tissues during the procedure. Overall, TRUS is a well-tolerated and standardized procedure for the histologic diagnosis of prostate cancer with rare complications. One paper sites only 3 confirmed cases of vertebra infections between the 1960s and 2010 but cases are now growing. [i] One study reviewed the charts of 1000 consecutive patients that underwent TRUS. All patients received perioperative antibiotic prophylaxis. Of the 1000 patients, 25 (2.5%) had post-biopsy complications requiring hospital admission or ED visit. Of these 12% had urosepsis, 0.8% has acute urinary retention, and 0.4% had hematuria requiring bladder irrigation.[ii]

Prostate specific antigen based screening:

Prostate specific Antigen (PSA) screening in men aged 50 to 74 years has been evaluated in many randomized control trials. One trial, the PLCO trial found a non-statistically significant increase in prostate cancer mortality in the annual screening group at 11.5 and 13 years, with results consistently favoring the usual care group.[iii,iv] Another study, the European Randomized Study of Screening for Prostate Cancer (ERSPC) used data from 7 centers in different European countries, with a total of 162,387 men undergoing randomization. With an average and median follow-up times of 8.8 and 9.0 years, in the screening and control groups respectively, there were 214 prostate cancer deaths in the screening group and 326 in the control group. Thus based on these study results, to prevent 1 death from prostate cancer, 1410 (95% CI, 1132–1721) men need to be screened and 48 men treated. Neither the PLCO trial nor ERSPC found a difference in all cause mortality.[v] These trials did help demonstrate the imperfections of PSA as a screening test for prostate cancer. False-positive PSA test results are common and vary depending on the PSA cutoff used and frequency of screening. After 4 PSA tests, men in the screening group of the PLCO trial had a 12.9% cumulative risk of receiving at least 1 false-positive result (defined as a PSA level greater than 4.0 μg/L and no prostate cancer diagnosis after 3 years) and a 5.5% risk of having at least 1 biopsy due to a false-positive result.[vi] In one systematic review, researchers pooled data from six randomized controlled trials (Including PLCO and ERSPC) with a total of 387,286 patients. Analysis showed a number needed to harm of 5 by undergoing a prostate biopsy for a false positive PSA. It also showed 1 in 34 developed ED, and 1 in 56 developed urinary incontinence.[vii]

Conclusion:

The high likelihood of false-positive results from the PSA test, coupled with the need for TRUS to distinguish indolent from aggressive tumors, means that a substantial number of men undergo biopsy. The more men undergo biopsy the higher the complications and the higher the risks of screening. Of men that are then diagnosed without complications, many opt to undergo early treatment such as radical prostatectomy, which has its own risks. These men may not have known about their diagnoses and lived with indolent cancer for many years. Numbers suggest that in fact, these men die from other conditions than prostate cancer. One could argue that even if PSA was a great screening test (few false positives) and TRUS was a zero risk diagnostic test, the question of whether to screen men for prostate cancer would still be a valid one if their diagnosis remained clinically insignificant.

With such a high rate of detection of prostate cancer many of which remain clinically insignificant as in the case above, the term over-diagnosis has been used to describe process of prostate cancer screening. Prostate cancer is the most commonly diagnosed

non-skin cancer in men and the 2nd most common cause of death from cancer (lifetime rate of diagnosis ~16%). However, most cases of prostate cancer have good prognosis even without treatment. The lifetime risk of death from prostate cancer in 2.8% and 70% of deaths occur after age 75. [viii] The USPSTF now recommends against PSA-based screening for prostate cancer in all age groups (Grade D). Other groups such as The American Cancer Society and The American College of Preventive Medicine essentially recommend shared& informed decision-making. Thus, we as clinicians have a role in deciding whether prostate cancer screening is worth-while for our patients. One could argue that in matters like this it is impossible to "do no harm". Rather, how we can minimize harm to help the most number of patients while hopefully minimizing cases like the one depicted above.

References

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