

# ***Prostate Cancer 2 - The Case of Mr. Powers' Prostate Cancer Recurrence***

Mr. Powers is a young appearing, healthy 73-year old male who underwent a radical prostatectomy nine years ago for prostate cancer. He now has evidence of prostate cancer recurrence. You are expected to direct the evaluation, education, and management of this patient.



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# LEARNING OBJECTIVES

1. Describe the natural history and the common patterns of progression of prostate cancer
2. List the signs & symptoms of metastatic prostate cancer
3. List the options for management of metastatic prostate cancer and describe the mechanisms by which these treatments work



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# Mr. Powers Finally Returns to Clinic

Mr. Powers has spent the last several years travelling the world and enjoying himself (“Yea, baby”). He underwent a radical prostatectomy nine years ago for Gleason 6 prostate cancer. While his initial PSA was undetectable his first year, it began to rise slowly after that. He suffered moderate erectile dysfunction after the procedure, but has now recovered fully. Unfortunately, his jet setting lifestyle has filled up his schedule and he was lost to follow-up. Now, Mr. Powers reports no urinary problems and no bone pain. On physical exam, his MoJo is intact and the prostate bed is empty on DRE (as would be expected).

His PSA level is checked and comes back 68 ng/ml.



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# Managing Mr. Powers High PSA

Mr. Powers cringes upon learning that the traditional therapy for advanced prostate cancer was bilateral orchiectomy. "Not my wedding tackle, Baby," he rants.

The rationale for this therapy is that testosterone (and other androgens) actively stimulate the growth of prostate cancer. His urologist mentions that orchiectomy for prostate cancer are rarely performed in the United States now that equally effective medical therapies exist. After therapeutic review of his treatment options, Mr. Powers is started on injections of goserelin (Zoladex).

This drug and the similar drug leuprolide (Lupron) work by what mechanism?



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# High PSA Treatment

Goserelin (Zoladex) and leuprolide (Lupron) both are gonadotropin releasing-hormone agonists (yes, agonists) that down regulate the sex-hormone axis and eliminate the production of testosterone from the testes.

In contrast to the normal pulsatile secretion of GnRH, these drugs produce a continuous level of stimulation, and after a short flare (increase) of hormonal activity, eliminate the normal pulsatility of the sex-hormone axis. Constant stimulation of the pituitary reduces stimulation to the testis, rather than stimulating it. Of note, some androgen production is still possible from the adrenal gland, and some urologists feel that one should also give a testosterone-receptor blocker to decrease this androgenic activity and prevent any side effects from the initial flare.



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# Mr. Powers Refers a Family Member

Mr. Powers' PSA falls dramatically after his first injection of goserelin (Zoladex). Again he makes plans for time travel (“Way to go, baby”). Mr. Powers comes in every three months for this injection, and his PSA is followed closely.

Several months later, Mr. Powers' father shows up at the clinic, saying that his son forced him to get medical attention since he is having trouble urinating. In addition, Mr. Powers Sr. mentions that his back and hip have been so painful over the last few months that he has been forced to limit his “usual” nocturnal activities. On physical examination, his abdomen is distended, his MoJo is intact, and his prostate is rock-hard and 5cm in breath. His spine and hip are tender to palpation, and his neurologic exam is intact. Ultrasound of his pelvis shows a distended bladder, and placement of a Foley catheter yields 800cc of urine, resulting in much relief to the elder Mr. Powers.



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# Next For Mr. Powers Sr.

Later, his PSA is measured at 258ng/ml. Plain films of his hip and spine reveal small osteoblastic lesions.

What is his presumptive diagnosis?

What is the most likely next step after confirmatory biopsy?



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# Mr. Powers Sr. Dx/Tx

Mr. Powers Sr. has metastatic prostate cancer.

Therapies for localized prostate cancer like radical prostatectomy and radiotherapy directed to the prostate are not effective when prostate cancer is metastatic. Hormone therapies may include orchiectomy or gonadotropin-releasing hormone agonist (with possible testosterone-receptor blocker) or gonadotropin-releasing hormone antagonists (more expensive). Later therapies for metastatic prostate cancer include ketoconazole and prednisone, chemotherapy, and immunotherapy.



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# Take Home Messages

1. Prostate cancer is a slow-growing malignancy which often disseminates in a step-wise fashion, moving from the prostate to the pelvic lymph nodes, and then to the spine and pelvic bones.
2. Signs and symptoms of advanced and metastatic prostate cancer include urinary retention and bone pain.
3. The primary treatment option for metastatic prostate cancer is hormone therapy.
4. The gold-standard for hormone therapy for prostate cancer has traditionally been bilateral orchiectomy. In the United States, this has now been largely replaced by medical castration with goserelin (Zoladex) and leuprolide (Lupron).
5. Both goserelin and leuprolide are gonadotropin releasing-hormone *agonists* which shut down the sex-hormone axis and eliminate the production of testosterone from the testes.



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