

Erectile Dysfunction Case Study 2

Medical Student Case-Based Learning



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The Case of Mr. Power's Limp Mojo

Mr. Powers develops erectile dysfunction after his radical prostatectomy for prostate cancer. You are expected to direct the evaluation, education, and management of this patient.



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Learning objectives

- List and briefly describe the major etiologies of erectile dysfunction (ED)
- List the important components of the history and physical examination of a patient with ED
- List the treatment options for ED and describe the mechanisms by which these treatments work
- Describe the indications, contraindications and side-effects of phosphodiesterase inhibitors (PDEI), such as sildenafil (Viagra)
- Describe how to counsel a patient so that he uses PDEI therapy effectively



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Mr. Powers mourns his limp MoJo

Mr. Powers is a 63-year old male diagnosed last year with moderately-differentiated prostate cancer found in a prostatic nodule. Desiring to "get that evil cancer out of my body," he underwent a radical prostatectomy. His prostate-specific antigen was 1.6 ng/ml at the time of diagnosis and has remained undetectable in the post-operative period thus far, consistent with complete excision of the tumor and prostate. While he is still able to have sex with his partners, his erections are now noticeably less firm than prior to the surgery. At times, he is unable to achieve vaginal penetration and becomes quite despondent that the surgery "took the go-go out of (his) MoJo." He requires the help of a Swedish vacuum device to get him a reasonable erection.

Given that he underwent a radical prostatectomy, what is the most likely etiology of Mr. Power's ED?



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Post-prostatectomy ED

- Given Mr. Power's history of radical prostatectomy, his ED most likely results from **cavernous nerve injury**.
- The cavernous nerves which control erectile function run just posterior and lateral to the prostate. During a radical prostatectomy, Urologists often attempt to spare these nerves as they dissect out the prostate. However, if a tumor nodule is felt to be close to a cavernous nerve on one side, the Urologist may decide to deliberately excise the nerve on that side to ensure that all of the cancer is removed. Even if surgeons attempt to spare the nerves bilaterally, erectile dysfunction can result in 5-40% of patients, likely due to injury of these nerves during the dissection of the prostate. Thus, Mr. Powers' ED which developed after his radical prostatectomy is almost definitely due to injury to the cavernous nerves during the procedure. Injury to these nerves is also the mechanism of ED resulting from radiotherapy (external beam or brachytherapy) for prostate cancer.



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Etiologies of ED

- Additional causes of ED which should always be considered include:
 - Vascular: Major risk factors for vascular disease (smoking, diabetes, hypertension, and hypercholesterolemia) are also major risk factors for ED.
 - Hormonal: Controversial role for testosterone, which is crucial for libido
 - Traumatic: May impair primary blood supply, nerves or disrupt corporal bodies
 - Iatrogenic: In addition to surgery or radiation to the pelvis, medications such as thiazides
 - Neurologic: Primary neurologic disease, neuropathy (diabetes)
 - Psychogenic: Critical to elicit component in history

References: Leu 2015. Campbell's Urology (11th ed). New York: Elsevier Science. NEJM 2000; 342 (24): 1802-1813



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Mr. Powers wants to get back to action

Mr. Powers returns to his Urologist to report the difficulties with his MoJo and to ask what can be done to “heat things up.” The Urologist reviews Mr. Powers’ past medical history: gunshot wounds, hypertension, and history of gallstones, liver damage from hallucinogenic chemicals, and multiple bouts of gonorrhea and genital warts. He is currently taking no medications. On physical examination, his surgical incision is well healed. He has a normal circumcised phallus with no evidence of deformity or fibrosis. The remainder of the examination is normal. The Urologist discusses with Mr. Powers that she did perform a nerve-sparing radical prostatectomy, but even so, his erectile dysfunction is likely due to incidental nerve damage from the surgery. She suggests that Mr. Powers start an empiric trial of an oral phosphodiesterase inhibitor (PDEI) to amplify any remaining function of the cavernous nerves. After confirming that there are no contra-indications for prescribing a PDEI:

What instructions should the Urologist give Mr. Power’s regarding the effective use of a PDEI?



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Use of PDEI

- Absorption of most of the PDEI medications is improved with an empty stomach.
- Instruct patients to take the medication at least one hour prior to sexual activity for peak plasma concentration.
- Common side effects include headache, flushing, dyspepsia, nasal congestion, muscle pain, and altered vision.
- The short duration of efficacy demands good foresight on behalf of users. Do not take more than one dose every 24 hours.
- You cannot take a PDEI, watch a football game, and expect an erection to occur. Unless you really like football, sexual stimulation is necessary for the drug to be effective. PDEI therapy primes the pump, and the rest is up to the user and his partner.

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Mr. Powers is disappointed with PDEI response

Mr. Powers is disappointed to find that trials of several PDEI do nothing for his ED, in spite of closely following all of the directions and titrating the dose upward. His Urologist then discusses with him other treatment options.

Which additional treatment options would be appropriate for Mr. Powers?



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Treatment of ED

- Vacuum constriction device
 - Draws blood into the penis, combined with a constrictive ring to prevent venous leakage
- Intraurethral prostaglandin E1 administration
 - Causes vasodilation of penile arterioles
- Intracavernosal injection of prostaglandin E1
- Surgical placement of a penile prosthesis



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Mr. Powers' MoJo rises again!

Mr. Powers discusses the various treatment options with his partner and decides to continue treatment with his Swedish vacuum constriction device. He is extremely pleased with the device, although he notes that there can occasionally be some discomfort from the constrictive band which must be placed at the base of his penis to prevent the outflow of the blood.



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Take home messages

- Radical prostatectomy and radiotherapy can result in ED due to injury of the cavernous nerves which run just posterior and lateral to the prostate.
- Treatment options for erectile dysfunction include oral PDEI, intracorporeal prostaglandin E1 injections, vacuum constriction devices, and surgical insertion of a penile prosthesis.
- Side-effects of PDEI include flushing, headache, dyspepsia, muscle pain and vision changes.
- Oral PDEI in general should be taken on an empty stomach one hour prior to sexual activity, require sexual stimulation to achieve an erection, and are effective for 4-6 hours.

