CASE REPORT

Priapism as a possible acute side effect of radical radiotherapy for prostate cancer

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We report a case of a 73 year-old male diagnosed with T1 N0 M0 prostate cancer, Gleason score 7, undergoing a course of radical radiotherapy using 7600 cGY delivered in 38 fractions. Several hours after receiving his 27th fraction, he reported experiencing a painful penile erection lasting more than 6 hours. A history and several investigations were conducted to determine the etiology of this adverse event. Although several possible etiologies were considered, the two most likely possibilities were direct prostate-irradiation and/or his use of alfuzosin, a novel alpha 1-adrenergic antagonist. A literature search revealed one case of priapism secondary to radiotherapy as well as reports of priapism associated with drugs similar to alfuzosin.

Key Words: priapism, radiotherapy, alfuzosin, alpha 1-adrenergic antagonist

Introduction

Priapism is a urological emergency defined as a pathologic penile erection that persists beyond, or is unrelated to sexual stimulation.[1] It is classified as ischemic versus non-ischemic. Of the two types, ischemic is more common and is characterized by a painful, firm erection resulting from impaired venous outflow.[1] The nonischemic form is usually painless and soft, and is believed to be due to unregulated cavernous inflow.[1]

There are numerous causes of priapism, which are classified as either primary or secondary. Primary (idiopathic) priapism accounts for approximately 30%-50% of cases.[1] Secondary causes include: thromboembolic disease associated with conditions such as sickle-cell anemia, leukemia, fat emboli and thrombus; neurogenic disorders including spinal cord lesions and cauda equina syndrome; metastatic cancer involving the penis related to prostate, bladder and kidney tumors; and numerous medications including those for the treatment of erectile dysfunction, antidepressants, antipsychotics, anxiolytics, alpha-1-adrenergic antagonists, anticoagulants and recreational drugs such as cocaine.[1] There is one case report in the literature of priapism associated with radiotherapy.

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Case report

Mr. S. is a 73-year old gentleman who was recently diagnosed with T1 N0 M0 adenocarcinoma of the prostate, with a Gleason score of 7. His past medical history includes deep vein thrombus (DVT) in 1985 and he underwent carotid endarterectomy in 1994. Further, he has a chronic history of obesity, hypertension, hypercholesterolemia, non-insulin-dependent diabetes mellitus and emphysema. He has a remote 35 pack-year history of cigarette smoking (he quit 12 years ago) and he occasionally drinks alcohol in moderation. Both his father and paternal grandfather were also diagnosed with prostate cancer. He has been impotent for 12 years.

His list of medications include: nifedipine (Adalat®), ramipril (Altace®), atenolol (Tenormin®), furosemide (Lasix®), acetylsalicylic acid (Aspirin®), atorvastatin (Lipitor®), pioglitazone (Actos®), ipratroprium/albuterol (Combivent®), and fluticasone (Flovent®). These have been used as directed for at least 2 years. Approximately 1 month prior to commencing radiotherapy, he started alfuzosin (Xatral®), for the treatment of urinary

symptoms associated with benign prostatic hyperplasia (BPH).

He received his 27th fraction (cumulative dose of 5400 cGY) in the morning and proceeded to go home for lunch. Approximately 3 hours later, while sitting at home reading the daily newspaper, he spontaneously developed a firm erection. He was very surprised, since he has not had any erections in 12 years despite trying intracavernous papaverine, phentolamine, and prostaglandin E-1 (Trimix®) injections and sildenafil (Viagra®) upon the advice of his urologist. Unfortunately, his erection lasted more than 6 hours and was endured with severe pain. Embarrassment precluded seeking medical treatment and the episode resolved spontaneously.

Discussion

With careful history-taking, medical investigations and a review of the literature, we attempted to explain the etiology of priapism in Mr. S. First, in light of his numerous risk factors for vascular disease, a thrombotic veno-occlusive episode is a possibility. Obstruction of venous drainage promotes stasis and subsequent thrombosis, leading to erection with pain.[1] However it is unlikely that a thrombotic episode would resolve spontaneously.

Priapism secondary to hematologic disease is unlikely in Mr. S. He has no personal or family history of sickle-cell anemia, or leukemia. Further, he was otherwise feeling well and denied constitutional symptoms. A recent complete blood count (CBC) was unremarkable.

Priapism has been reported in numerous neurologic disorders including lumbar stenosis, cauda equina compression syndrome, spinal cord injury, and herniated disk.[1] It is thought that these conditions augment the release of parasympathetic, erection-inducing neurotransmitters, and/or inhibit the tonic firing of sympathetic neurons that promote flaccidness.[1] Since Mr. S. has not complained of neurologic dysfunction consistent with the above disorders, neurogenic causes of priapism are unlikely.

There have been reports of metastatic malignancies to the penis causing priapism. It is believed that malignant infiltration impairs venous drainage and promotes stasis and thrombosis.[1] Among others, prostatic[2] and renal[3] cancers have been implicated. Although it is difficult to exclude these with absolute certainty, they are unlikely in Mr. S given his early stage and intermediate grade prostatic adenocarcinoma. Further, a recent bone scan and CT-scan of his abdomen/pelvis were both unremarkable and negative for metastatic disease.

As previously mentioned, numerous drugs have been reported to cause priapism. A literature search revealed no cases of priapism associated with the medications specifically used by Mr. S. With the exception of the occasional use of alcohol, he does not use recreational drugs. He is not using other drugs associated with priapism, including antidepressants, antipsychotics, anxiolytics or gonadotropin-releasing hormone.[1] One query, however, relates to his use of a novel alpha 1-adrenergic antagonist called Xatral® (alfuzosin) for treatment of BPH. There have been numerous reports of priapism associated with older-generation alpha 1-adrenoreceptor blocking drugs such as prazosin,[4] terazosin[5] and doxazosin.[6] However, although a few cases of priapism have been reported with Xatral®, a causal association has not been firmly established.

Could Mr. S's priapism have been induced by radiotherapy? Review of the literature reveals one other case which was believed to have been precipitated by radiation.[7] The early effects of radiation on prostatic parenchyma are not well understood. Although acute inflammation does not appear to be a feature of the irradiated prostate,[8] tissue edema is a well recognized phenomenon following local irradiation. Hence, it is possible that priapism was due to radiation-induced edema in periprostatic tissues causing obstruction of venous outflow of the deep dorsal veins.

In conclusion, this case report suggests that priapism may be an unusual acute complication of radiotherapy which may be underreported due to patient embarrassment. Patients should be warned of this rare but uncomfortable complication. □

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