22.5: Disorders of the Male Reproductive System

Offering to the Gods

The marble penis and scrotum depicted below comes from ancient Rome, during the period from about 200 BCE to 400 CE. During that time, offerings like this were commonly given to the gods by people with health problems, either in the hopes of a cure or as thanks for receiving one. The offerings were generally made in the shape of the afflicted body part. Scholars think this marble penis and scrotum may have been an offering given in hopes of — or thanks for — a cure for impotence, known medically today as erectile dysfunction.

Figure (PageIndex(1)): Votive male genitalia, Roman, 200 BCE-400 CE
Erectile Dysfunction

Erectile dysfunction (ED) is sexual dysfunction characterized by the regular and repeated inability of a sexually mature individual to obtain or maintain an erection. It is a common disorder that affects about 40 percent of people with penises.

Causes of Erectile Dysfunction

The penis normally stiffens and becomes erect when the columns of spongy tissue within the shaft of the penis (the corpora cavernosa and corpus spongiosum) become engorged with blood. Anything that hampers normal blood flow to the penis may, therefore, interfere with its potential to fill with blood and become erect. The normal nervous control of sexual arousal or penile engorgement may also fail and lead to problems obtaining or maintaining an erection.

Specific causes of ED include both physiological and psychological causes. Physiological causes include the use of therapeutic drugs (such as antidepressants), aging, kidney failure, diseases (such as diabetes or multiple sclerosis), tobacco smoking, and treatments for other disorders (such as prostate cancer). Psychological causes are less common but may include stress, performance anxiety, or mental disorders. The risk of ED may also be greater in people with obesity, cardiovascular disease, poor dietary habits, and overall poor physical health. Having an untreated hernia in the groin may also lead to ED.

Treatments for Erectile Dysfunction

Treatment of ED depends on its cause or contributing factors. For example, for tobacco smokers, smoking cessation may bring significant improvement in ED. Improving overall physical health by losing weight and exercising regularly may also be beneficial. The most common first-line treatment for ED, however, is the use of oral prescription drugs, known by brand names such as Viagra® and Cialis®. These drugs help ED by increasing blood flow to the penis. Other potential treatments include topical creams applied to the penis, injection of drugs into the penis, or the use of a vacuum pump that helps draw blood into the penis by applying negative pressure. More invasive approaches may be used as a last resort if other treatments fail. These usually involve surgery to implant inflatable tubes or rigid rods into the penis.

Ironically, the world’s most venomous spider —the Brazilian wandering spider (Figure 2) — may offer a new treatment for ED. The venom of this spider is known to cause priapism in humans. Priapism is a prolonged erection that may damage the reproductive organs and lead to infertility if it continues too long. Researchers are investigating one of the components of the spider’s venom as a possible treatment for ED if taken in minute quantities.
Epididymitis

Epididymitis is inflammation of the epididymis. The epididymis is one of the paired organs within the scrotum where sperms mature and are stored. Discomfort or pain and swelling in the scrotum are typical symptoms of epididymitis, which is a relatively common condition, especially in young individuals. In the U.S. alone, more than half a million cases of epididymitis are diagnosed annually between the ages of 18 to 35.

Acute vs. Chronic Epididymitis

Epididymitis may be acute or chronic. Acute diseases are generally short-term conditions, whereas chronic diseases may last years — or even lifelong.

Acute Epididymitis

Acute epididymitis generally has a fairly rapid onset and is most often caused by a bacterial infection. Bacteria in the urethra can back-flow through the urinary and reproductive structures to the epididymis. In sexually active individuals, many cases of acute epididymitis are caused by sexually transmitted bacteria. Besides pain and swelling, common symptoms of acute epididymitis include redness, warmth in the scrotum, and a fever. There may also be a urethral discharge.

Chronic Epididymitis

Chronic epididymitis is epididymitis that lasts for more than three months. In some, the condition may last for years. It may occur with or without a bacterial infection being diagnosed. Sometimes, it is associated with lower back pain that occurs after an activity that stresses the lower back, such as heavy lifting or a long period spent driving a vehicle.

Treatment of Epididymitis

If a bacterial infection is suspected, both acute and chronic epididymitis are generally treated with antibiotics. For chronic epididymitis, antibiotic treatment may be prescribed for as long as four to six weeks to ensure the complete eradication of any possible bacteria. Additional treatments often include anti-inflammatory drugs to reduce inflammation of the tissues and painkillers to control the pain, which may be severe. Physically supporting the scrotum and applying cold compresses may also be recommended to help relieve swelling and pain.

Regardless of symptoms, treatment is important for both acute and chronic epididymitis, because major complications may occur otherwise. Untreated acute epididymitis may lead to an abscess — which is a buildup of pus — or to the infection spreading to other organs. Untreated chronic epididymitis may lead to permanent damage to the epididymis and testis, and it may even cause infertility.
Male Reproductive Cancers

Why does the Brazilian hospital pictured below have a huge blue mustache on its “face”? The mustache is a symbol of “Movember.” This is an international campaign to raise awareness of prostate cancer, as well as money to fund prostate cancer research.

![Image of hospital with mustache]

Figure 3: The mustache is a symbol for “Movember,” a campaign against prostate cancer.

Prostate Cancer

The prostate gland is an organ located in the male pelvis. The urethra passes through the prostate gland after it leaves the bladder and before it reaches the penis. The function of the prostate is to secrete zinc and other substances into semen during ejaculation. In the United States, prostate cancer is the most common type of cancer and the second leading cause of cancer death in people carrying prostate gland. About 80 percent of Americans individuals with the prostate will have cancerous cells in their prostate gland by the age of 80.

How Prostate Cancer Occurs

Prostate cancer occurs when glandular cells of the prostate mutate into tumor cells. Eventually, the tumor, if undetected, may invade nearby structures, such as the seminal vesicles. Tumor cells may also metastasize and travel in the bloodstream or lymphatic system to organs elsewhere in the body. Prostate cancer most commonly metastasizes to the bones, lymph nodes, rectum, or lower urinary tract organs.

Symptoms of Prostate Cancer

Early in the course of prostate cancer, there may be no symptoms. When symptoms do occur, they mainly involve urination, because the urethra passes through the prostate gland. The symptoms typically include frequent urination, difficulty starting and maintaining a steady stream of urine, blood in the urine, and painful urination. Prostate cancer may also cause problems with sexual function, such as difficulty achieving an erection or painful ejaculation.

Risk Factors for Prostate Cancer

Some factors that increase the risk of prostate cancer can be changed, and others cannot.
• Risk factors that can be changed include a diet high in meat, a sedentary lifestyle, obesity, and high blood pressure.
• Risk factors that cannot be changed include older age, a family history of prostate cancer, and African ancestry. Family history is an important risk factor, so genes are clearly involved. Many different genes have been implicated.

Diagnosing Prostate Cancer

The only definitive test to confirm a diagnosis of prostate cancer is a biopsy. In this procedure, a small piece of the prostate gland is surgically removed and then examined microscopically. A biopsy is done only after less invasive tests have found evidence that a patient may have prostate cancer.

A routine exam by a doctor may find a lump on the prostate, which might be followed by a blood test that detects an elevated level of prostate-specific antigen (PSA). PSA is a protein secreted by the prostate that normally circulates in the blood. Higher-than-normal levels of PSA can be caused by prostate cancer, but they may also have other causes. Ultrasound or magnetic resonance imaging (MRI) might also be undertaken to provide images of the prostate gland and additional information about cancer.

Treatment of Prostate Cancer

The average age at which men are diagnosed with prostate cancer is 70. Prostate cancer typically is such a slow-growing cancer that elderly patients may not require treatment. Instead, the patients are watched carefully over the subsequent years to make sure the cancer isn’t growing and posing an immediate threat — an approach that is called active surveillance. It is used for at least 50 percent of patients who are expected to die from other causes before their prostate cancer causes symptoms.

Treatment of younger patients — or those with more aggressively growing tumors — may include surgery to remove the prostate, chemotherapy, and/or radiation therapy (such as brachytherapy, see photo below). All of these treatment options can have significant side effects, such as erectile dysfunction or urinary incontinence. Patients should learn the risks and benefits of the different treatments, and discuss them with their healthcare provider to decide on the best treatment options for their particular case.

Figure \( \PageIndex{4} \): Brachytherapy is a form of radiation therapy for prostate cancer. Radioactive “seeds” like the ones shown here are inserted into the prostate gland. The seeds give off radiation that kills cancer cells.
Testicular Cancer

Reproductive cancer that is rare and most commonly affects young individuals is testicular cancer. The testes are the paired reproductive organs in the scrotum that produce sperm and secrete testosterone. The risk of testicular cancer is about four to five times greater in individuals of European than African ancestry. The cause of this difference is unknown.

Signs and Symptoms of Testicular Cancer

One of the first signs of testicular cancer is often a lump or swelling in one of the two testes. The lump may or may not be painful. If pain is present, it may occur as a sharp pain or a dull ache in the lower abdomen or scrotum. Some people with testicular cancer report a feeling of heaviness in the scrotum. Testicular cancer does not commonly spread beyond the testis, but if it does, it most often spreads to the lungs, where it may cause shortness of breath or a cough.

Diagnosis of Testicular Cancer

The main way that testicular cancer is diagnosed is by detection of a lump in the testis. This is likely followed by further diagnostic tests. An ultrasound may be done to determine the exact location, size, and characteristics of the lump. Blood tests may be done to identify and measure tumor-marker proteins in the blood that are specific to testicular cancer. CT scans may also be done to determine whether the disease has spread beyond the testis. However, unlike the case with prostate cancer, a biopsy is not recommended, because it increases the risk of cancer cells spreading into the scrotum.

Treatment of Testicular Cancer

Testicular cancer has one of the highest cure rates of all cancers. Three basic types of treatment for testicular cancer are surgery, radiation therapy, and/or chemotherapy. Generally, the initial treatment is surgery to remove the affected testis. If the cancer is caught at an early stage, the surgery is likely to cure the cancer, and has nearly a 100 percent five-year survival rate. When just one testis is removed, the remaining testis (if healthy) is adequate to maintain fertility, hormone production, and other normal functions. Radiation therapy and/or chemotherapy may follow surgery to kill any tumor cells that might exist outside the affected testis, even when there is no indication that the cancer has spread. In many cases, however, surgery is followed by surveillance instead of additional treatments.

Summary

- Erectile dysfunction (ED) is a disorder characterized by the regular and repeated inability of a sexually mature male to obtain and maintain an erection. ED is a common disorder that occurs when normal blood flow to the penis is disturbed, or when there are problems with the nervous control of penile engorgement or arousal.
- Possible physiological causes of ED include aging, illness, drug use, tobacco smoking, and obesity, among others. Possible psychological causes of ED include stress, performance anxiety, and mental disorders.
- Treatments for ED may include lifestyle changes, such as stopping smoking, adopting a healthier diet, and regular exercise. The first-line treatment, however, is prescription drugs such as Viagra® or Cialis® that increase blood flow to the penis. Vacuum pumps or penile implants may be used to treat ED if other types of treatment fail.
- Epididymitis is inflammation of the epididymis. It is a common disorder, especially in young people. It may be acute or chronic and is often caused by a bacterial infection. Treatments may include antibiotics, anti-inflammatory drugs, and painkillers. Treatment is important to prevent the possible spread of infection, permanent damage to the...
epididymis or testes, and even infertility.

• Prostate cancer is the most common type of cancer and the second leading cause of cancer death in prostate carrying individuals. If there are symptoms, they typically involve urination, such as frequent or painful urination. Risk factors for prostate cancer include older age, family history, high-meat diet, and sedentary lifestyle, among others.

• Prostate cancer may be detected by a physical exam or a high level of prostate-specific antigen (PSA) in the blood, but a biopsy is required for a definitive diagnosis. Prostate cancer is typically diagnosed relatively late in life and is usually slow growing, so treatment may not be necessary. In younger patients or those with faster-growing tumors, treatment is likely to include surgery to remove the prostate, followed by chemotherapy and/or radiation therapy.

• Testicular cancer, or cancer of the testes, is the most common cancer in individuals between the ages of 20 and 39 years. It is more common in European than African ancestry. A lump or swelling in one testis, fluid in the scrotum, and testicular pain or tenderness are possible signs and symptoms of testicular cancer.

• Testicular cancer can be diagnosed by a physical exam and diagnostic tests, such as ultrasound or blood tests. Testicular cancer has one of the highest cure rates of all cancers. It is typically treated with surgery to remove the affected testis, and this may be followed by radiation therapy and/or chemotherapy. If the remaining testis is healthy, normal male reproductive functions are still possible after one testis is removed.

Review

1. What is erectile dysfunction? When does it occur?

2. Underlying causes of erectile dysfunction may include physiological and/or psychological factors. Identify some of these factors.

3. Discuss types of treatment for erectile dysfunction.

4. Define epididymitis. What is its most common cause?

5. Identify possible treatments for epididymitis. Why is treatment important, even when there are no symptoms?

6. Rank prostate cancer as a cause of cancer and cause of cancer death in men. What are some of the symptoms of prostate cancer?

7. List risk factors for prostate cancer.

8. How is prostate cancer detected?

9. In many cases, treatment for prostate cancer is unnecessary. Why? When is treatment necessary, and what are treatment options?

10. Testicular cancer is generally rare, but it is the most common cancer in one age group. What age group is it?

11. Identify possible signs and symptoms of testicular cancer.

12. How can testicular cancer be diagnosed?

13. Describe how testicular cancer is typically treated.
14. Which of the following is common in younger individuals (i.e. under age 39)?

A. prostate cancer
B. testicular cancer
C. epididymitis
D. B and C

15. A biopsy is important in cases of suspected _____________.

A. epididymitis
B. testicular cancer
C. prostate cancer
D. B and C

Explore More

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Testicular self-exams may catch testicular cancer at a relatively early stage when a cure is most likely. The American Urological Association recommends monthly testicular self-exams for all adolescents (to about age 35), whereas the American Cancer Society recommends the self-exams only for those with a family history of testicular cancer. There is no medical consensus on testicular self-exams, however, and some medical organizations even recommend against them. The latter argue that the potential harms of self-exams — which include false-positive results, anxiety, and risks from diagnostic procedures — outweigh the potential benefits, given the very low incidence and high cure rate of even advanced testicular cancer. If you are a young person, you should discuss with your physician whether you should perform routine testicular self-exams. The self-exam is quick, easy, and painless to do. You can see how to perform a testicular self-exam by watching one or both of the following videos:
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Regardless of whether you perform regular testicular self-exams, if you notice any of the following signs or symptoms, you should be examined by a doctor:

- a lump in one testis
- a change in the size of one testis
- pain or tenderness in the testis
- blood in the semen during ejaculation
- blood in the urine
- the build-up of fluid in the scrotum

Up to three percent of all full-term babies are born with undescended testicles. Learn more here:
Watch below to learn about the dangers of "herbal viagra":

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