

Treatment of Erectile Dysfunction Following Radical Prostatectomy

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PSA screening for prostate cancer has resulted in increasing numbers of men being diagnosed with curable prostate cancer early in life. Large numbers of these men are receiving treatment for prostate cancer with radiation therapy or radical prostatectomy.

FIRST SLIDE

In the early 1980's, Dr. Patrick Walsh pioneered nerve sparing radical prostatectomy. Before this, nearly all men having radical prostatectomy developed erectile dysfunction or ED. Dr. Walsh's nerve sparing operation has allowed many men to undergo this procedure without losing their ability to function sexually.

SECOND SLIDE

Quality of life issues, however, still remain following radical prostatectomy. These primarily include urinary incontinence and erectile dysfunction.

THIRD SLIDE

In a study of nearly 1300 patients, at 18 months following radical prostatectomy, 8.4% were experiencing significant urinary incontinence and nearly 60% had erectile dysfunction.

FOURTH SLIDE

Treatment options for erectile dysfunction following radical prostatectomy are the same as for most other types of erectile dysfunction. These include the type 5 phosphodiesterase inhibitors, sildenafil, vardenafil and tadalafil. While these oral medications work for many men with erectile dysfunction, their success rate is significantly less in men who have ED following radical prostatectomy. If oral medications are not effective, vacuum erection devices can be considered, however, in our experience these devices are poorly accepted by many of our patients and their partners. Penile injection therapy is the next treatment option; however, many men choose not to undergo life-long self injections of the penis as a method of managing their ED. For these men, penile prosthesis implantation is the next option.

FIFTH SLIDE

Men undergoing penile prosthesis implantation today have high expectations. They are no longer content to have a permanently rigid penis. They want to have, as closely as possible, natural flaccidity and natural erection. When they get an erection, they would like to obtain girth and length expansion of the penis as well as rigidity. Infection and erosion are problems inherent in penile prosthesis implantation, but today's devices have very low complication rates in this regard. Finally, devices with reasonable freedom from mechanical failure are desired.

SIXTH SLIDE

The so called 3 piece inflatable penile prostheses transfer a large volume of fluid into cylinders which expand in size. The paired cylinders are considered one piece, the small scrotal pump is the second piece, and the large volume abdominal fluid reservoir is the third piece. The Mentor 3 piece inflatable penile prosthesis, which is currently marketed by Coloplast, is one such device. The cylinders of this prosthesis expand only in diameter.

SEVENTH SLIDE

American Medical Systems, or AMS, also has a 3 piece inflatable penile prosthesis product line. This line includes cylinders expanding only in diameter as well as those expanding both in diameter and in length.

EIGHTH SLIDE

After radical prostatectomy by the retropubic approach, the lower abdominal fascia is scarred. Some urologic prosthetic surgeons avoid 3 piece inflatable penile prosthesis implantation because of this scarring. They fear that reservoir implantation will be difficult, require a second incision, or will lead to complications. Many of these surgeons choose a 2 piece inflatable penile prosthesis, the AMS Ambicor, for men who have had radical prostatectomy.

NINTH SLIDE

When inflated the AMS Ambicor prosthesis becomes rigid but does not increase in size. This device has rigidity comparable to semi-rigid rods, and a portion of this rigidity is lost when the device is deflated. In most implant recipients both erection and flaccidity are not as good as could be achieved with a 3 piece device.

TENTH SLIDE

We recently reviewed our experience with 942 consecutive American Medical Systems 3 piece inflatable penile prosthesis implantations. 115 of these men had this surgery to treat ED following radical retropubic prostatectomy. In all these men we used a penoscrotal approach for the implantation of all 3 components of the inflatable penile prosthesis. Reservoir implantation into the retropubic space was successful in all patients in this series and there were no complications related to reservoir placement.

ELEVENTH SLIDE

The cylinders used in the American Medical Systems 3 piece inflatable penile prosthesis consist of two types. CX cylinders increase only in diameter with inflation. These cylinders were introduced in 1986. Ultrex cylinders, currently designated LGX, were introduced in 1990. These cylinders provide the same increase in girth as the CX cylinders; however, they also expand in length.

TWELVTH SLIDE

This is an operating room photo following the completion of an LGX inflatable penile prosthesis implantation. The penis with the cylinders deflated is being held up and the length of the penis from the pubis to the glans tip is 11.5 cm.

THIRTEENTH SLIDE

With inflation there is increase in diameter, rigidity and length. The length has increased from 11.5 cm to 14 cm, an increase of 2.5 cm or 1 inch in length.

FOURTEENTH SLIDE

This is a patient at his post operative visit in the office. He is lifting up his penis prior to inflation of the device. The length of the penis is just over 5 inches.

FIFTEENTH SLIDE

With inflation his penis becomes rigid, increases in diameter and extends to almost 6 inches.

SIXTEENTH SLIDE

This shows very good flaccidity in a patient with an LGX inflatable penile prosthesis.

SEVENTEENTH SLIDE

With inflation the penis resembles a normal erection demonstrating an increase in diameter, length and rigidity

EIGHTEENTH SLIDE

In this publication we showed that all patients achieved at least a 1cm length increase with device inflation. The majority of patients received an increase of 2 cm or more in length when the Ultrex or LGX cylinders were inflated.

NINETEENTH SLIDE

Other advances in penile prosthesis design have been achieved. American Medical Systems introduced 2 device coatings in 2001. One coating is a parylene cylinder coating that increases cylinder survival. The other is an antibiotic coating with the trade name InhibiZone.

TWENTIETH SLIDE

On bench testing, where cylinders are repeatedly inflated and deflated until they fail, uncoated cylinders failed after 3.7 million cycles, whereas cylinders with parylene coating failed after 12.9 million cycles.

TWENTY-FIRST SLIDE

InhibiZone imparts an orange color to the surface of the prosthesis. This antibiotic coating is a combination of a tetracycline, minocycline, and rifampin which provides good coverage for staphylococcal organisms.

TWENTY-SECOND SLIDE

For men undergoing first time inflatable penile prosthesis implantation, a study was done comparing AMS 3 piece inflatable penile prostheses without the antibiotic coating to those with the coating. The infection rate at 6 months following surgery for uncoated devices was 1.61% whereas for those devices with the antibiotic coating, it was 0.68%.

TWENTY-THIRD SLIDE

In revision surgeries the infection rate traditionally has been somewhat higher. A similar study in revision implants showed the infection rate at 6 months to be 2.41% for uncoated devices compared to 1.36% for devices with the antibiotic coating. This antibiotic coating has appeared to significantly reduce the infection rate for both primary and revision surgeries.

TWENTY-FOURTH SLIDE

There are several studies looking at freedom from mechanical failure for various 3 piece penile prostheses using Kaplan-Meier analysis to provide actuarial survival curves. For the Mentor inflatable penile prosthesis the 5 year survival free of mechanical failure is 93%. The studies in the next 3 columns were all from our group. With the Ultrex or LGX penile prosthesis, the 5 year survival free of mechanical failure was 94%. For CX devices the 5 year survival was 92%, and for CX devices the 10 year freedom from mechanical failure was 81%.

TWENTY-FIFTH SLIDE

What about effectiveness and satisfaction following treatment with penile prostheses? In a study comparing 31 men being treated for erectile dysfunction with sildenafil, 22 men being treated with penile injections, and 32 men undergoing inflatable penile prosthesis implantation, the inflatable penile prosthesis group showed significantly better erectile function and patient satisfaction.

TWENTY-SIXTH SLIDE

In spite of nerve sparing radical prostatectomy, many men still develop erectile dysfunction following this procedure. Nearly all of these men undergo a treatment trial with a type 5 phosphodiesterase inhibitor. This oral therapy is effective in some but not in all, and the effectiveness is less in men following radical prostatectomy than it is with men who have erectile dysfunction due to other causes. When treatment with oral medication fails, patients need other treatment options. Second line treatment options such as vacuum erection devices and penile injection therapy have mixed popularity and success.

TWENTY-SEVENTH SLIDE

Penile prosthesis implantation is the only treatment option which is potentially useful in all men with erectile dysfunction. These devices provide high levels of patient and partner satisfaction. Three piece inflatable penile prostheses provide for most patients the best results, and implantation of these devices can be safely accomplished following radical prostatectomy.