Orthopedic Neobladder

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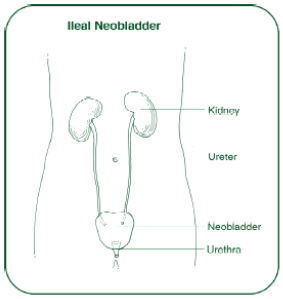
When cancer invades the muscle wall of the bladder it is usually necessary to surgically remove the entire infected bladder. If the cancer hasn't spread too far it is possible for doctors to create a new bladder, also called a neobladder, using tissue from your intestines. Cancer in the bladder is a very common disease in the United States and about 9000 people each year develop this type of cancer. Smoking is the most important risk factor for bladder cancer.

Cancer-causing chemicals in tobacco products are absorbed from the lungs and enter the blood. From the blood, they are filtered by the kidneys and collect in the urine and these chemicals damage the cells that line the inside of the bladder, increasing the risk of cancer.

An orthopedic neobladder is a substitute for the original bladder and it is placed in the same location where the old bladder was. It is constructed from loops of the small intestine. The doctor will usually take about 35-40 inches from the small intestine. The portion of intestine that is removed is cut open to create a flat piece (instead of a hollow tube). The flat piece of intestine is sewn together to form a grapefruit sized pouch where the ureters are connected to the end and the other end of the pouch is connected to the urethra. Urine will drain from the kidneys through the ureters and into the new orthopedic neobladder. The new bladder will store the urine and the individual will void through normal channels. Most patients are able to learn how to control the release of urine from the neobladder much like they did with a normal bladder. If the patient cannot learn to control the neobladder or other complications make it difficult, the use of a catheter is necessary to empty the bladder.

The neobladder is a substitute for the original bladder and it does not function entirely the same way. The original, normal bladder does two functions: it stretches and contracts. It stretches to store the urine and then contracts to empty the urine. The neobladder can stretch to store the urine but it cannot contract. This means that an individual will urinate in a different manner. Relaxing the sphincter muscle and contracting the abdominal muscles empty the neobladder. When the abdominal muscles are contracted, pressure is put on the bladder and this helps to push the urine out.

Candidates for the neobladder are patients who do not need to have the sphincter muscle removed, only the bladder removed. This means that if the tumor is located near the sphincter muscle, the patient will not be a candidate for the neobladder because the sphincter muscle is necessary for urination with the neobladder. In addition to cancer patients, patients with spinal cord injuries, bladder trauma, and non-cancerous tumors are also candidates for this bladder substitution. The patient must have full kidney and liver function and cannot have cancer in the urethra.



Advantages to this procedure include the avoidance of an external collection pouch and an abdominal stoma is not necessary. Most patients are able to urinate quite efficiently. All the materials are from the patient's own body, eliminating the need for antibiotics or immunosuppressive medications to fight rejection.

Disadvantages to the procedure include irregular urinary patterns and difficulty urinating. If the patient cannot remove all the urine while urinating, a catheter is necessary. Because the neobladder does not contract, some patients have difficulty holding their bladder and may experience leaks.

There are several alternatives to having a neobladder. One alternative is urostomy. In this procedure the bladder is removed and a conduit is made out of a section of small intestine or colon that carries the urine to an opening on the abdomen. The urine is collected in a drainable pouch that is secured to the abdomen. A second alternative is Continent Urinary Diversion. This involves the creation of an internal pouch from loops of the small intestine that is connected to the surface of the abdomen. There is a one-way passage between the opening on the abdomen (stoma) and the internal pouch. The urine is drained by passing a catheter through the stoma and into the pouch every three to four hours.

Sources:

http://www.uoaa.org/ostomy_info/pubs/uoa_brochure_neobladder.pdf

http://www.mc.vanderbilt.edu/reporter/index.html?ID=1107

http://cancer.stanfordhospital.com/forPatients/services/surgery/neobladderReconstruct/default

http://www.mdanderson.org/diseases/bladder/?Referrer=Google&KW=Bladder