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The case of the missing gonad : Using laparoscopy to diagnose and treat undescended testis.

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English is basic to academic advance

Hello ! Lovely readers

Here we are ! Time and again we keep pushing the indea of "English is basic to academic advance." Please put up with us as we all are responsible for "the making of a Medical World"

In this issue we like you to read this article which links anatomy (embryology) to surgery rather nicely and you will also learn the arts of surgical treatment as well. So go ahead and swallow it now!

Nestled within the scrotum like a pair of hard-boiled eggs, the testicles are crucial to a man's fertility and virility. In addition to producing sperm and the male sex hormone testosterone, the testes also are among the most outwardly visible signs of manhood.

Ironically, during fetal development the testes start out deep inside the abdomen near the kidneys. Not until around the seventh month of gestation do the gonads begin their southward migration through the inguinal canal and into the pouchlike scrotum.

However, among 3.5 percent of fullterm and up to one-third of premature male babies, one or both testicles fail to complete their journey by birth. Some testes may remain suspended within the abdomen, while others may take a wrong turn as they tunnel through the groin.

The condition, called cryptorchidism, or undescended testis (UDT), is among the most common abnormalities in males that brings them into the hospital before the age of 3. UDT typically involves only one testicle and often corrects itself within several months. However, if the problem doesn' t resolve naturally by the baby' s first birthday, an operation usually is recommended to bring the testis down into the scrotum.

The call for prompt surgical intervention goes beyond physical appearance; if left untreated for more than five years, and undescended testis will not develop normally and will be incapable of adequate sperm production. Furthermore, the risk of developing cancer in that testis is 50 times greater than normal.

Due to the high malignancy risk, the physician' s first order of business is to verify the presence of the missing gonad and to determine its exact location. In most cases, the testis can be detected simply by

palpating the groin or abdomen for a lump under the skin.

However, among about 20 percent of babies and children with UDT, the gonad cannot be felt, or palpated, because it is too deep within the body. Until quite recently, many such case required exploratory abdominal surgery - a lengthy, invasive undertaking - for proper diagnosis.

FROM GYNECOLOGY TO UROLOGY

Today, pediatric urologists at the University of Michigan Medical Center are accomplishing this task in a matter of minutes with a procedure called laparoscopy. Traditionally, laparoscopy - in which a viewing tube is inserted into the body through a tiny incision has been used mostly by gynecologists for peering into the reproductive system and diagnosing structural abnormalities that can interfere with female fertility.

"Laparoscopy is the ideal first step in locating and evaluating the nonpalpable testis," says David A. Bloom, M.D., an associate professor of surgery and chief of pediatric urology at C.S. Mott Children' s Hospital. "It makes sense, it' s rational, and I think it' s an application of laparoscopy that' s here to stay."

Studies indicate that diagnostic laparoscopy also is more reliable than sophisticated imaging tools-such as computed axial tomography and magnetic resonance imaging scans-for locating a wayward gonad. "MRI and CT scans aren' t very accurate in spotting an undescended testis. If you do see it, you still have to go in and deal with it surgically later. And if you don' t see it, that' s no proof that the testis isn' t there," Bloom says. An additional benefit of laparoscopy is that unlike MRI and CT scans, it involves no radiation exposure.

Laparoscopy in babies and children is performed under general anesthesia and involves inserting a thin, flexible tube with a video lens on the end through a small incision near the navel. A nearby TV monitor guides the surgeon' s progress as the viewing tube is snaked through the abdomen. Within minutes, the surgeon can determine whether the missin gonad indeed exists, its exact location and whether it' s in good enough condition to salvage.

If the gonad is found to be withered and very poorly developed, it can be removed on the spot in a quick and simple surgical procedure called orchidectomy. Removal of one testis - assuming the other is healthy and descended - does not affect sex drive, potency or the ability to have children.

If the undescended testis appears healthy, the first of a two-step repositioning operation can be initiated laparoscopically through an additional skin puncture while the child is still asleep.

Successful repositioning hinges on keeping the blood supply to the testis constant. Another important factor is the length of the blood vessel "leash" to which the testis is attached. This leash- the vas deferens- is the tube through which sperm travels to the outside, and it contains one of several vessels that supply blood to the testis. Unfortunately, in some children with UDT, the length of the vas deferens is too short to reach the scrotum.

GETTING READY FOR THE MOVE

The first step of the repositioning process involves getting the testis prepared for relocation by shifting its source of blood to the vas deferens artery alone. This is done by laparoscopically tying off, or blocking, the spermatic blood vessels that also feed the gonad. By shutting off the spermatic vessels, the testis is forced to live solely on the blood from the vas deferens artery. During the next few months, the vas artery enlarges to accommodate the increased demand while it keeps the testis healthy and nourished with oxygen-rich blood. This effect is especially helpful among patients born with a short vas deferens.

The second step is a two-hour operation called orchiopexy that' s schedule about six months after the laparoscopic vessel-blocking procedure. It involves severing the spermatic vessels, which tether the testis to the abdomen, and lowering the gonad and its newly expanded blood vessel leash into the scrotum.

In contrast, traditional abdominal orchiopexy is an open surgical procedure that' s performed in one step. The spermatic vessels are clipped to free the testis from the abdomen and the vas deferens is immediately pulled down into the scrotum before it has a chance to grow into its new role. As a result, the testis has a greater chance of being damaged from decreased blood flow.

"If you try to do the procedure all at once, you' re going to lose 25 to 30 percent of the testis

because it' s not getting enough blood supply," Bloom says. "The two-step procedure, on the other hand, reroutes the blood supply without disturbing the testis. It' s minimally invasive, it gets the testis ready to come down in a single operation, and it reduces the total time on the operating table."

Bloom pioneered this two-step procedure in the United States and was the first in the world to accomplish the initial vessel-blocking step laparoscopically. He's also one of the few American urologists who' ve been teaching the technique to others.

Bloom and his U-M colleagues since 1985 have performed laparoscopy for nonpalpable testes on more than 100 children, all with excellent results. Patient follow-up has found each of the repositioned gonads to be developing on schedule and with no post-surgical complication. Long-term fertility in these patients has yet to be determined. However, it is known that the cancer rate remains a bit higher; about 10 percent of men with testicular cancer have a history of UDT. Because such people are statistically more prone to developing cancer, the importance of testicular self-examination is stressed from adolescence through adulthood for those who' ve undergone the corrective procedure, says Bloom, a member of the U-M Comprehensive Cancer Center.

While two-step orchiopexy is still only available at a handful of centers nationwide, its use is gradually increasing as more urologists gain the skills and confidence to perform laparoscopy on tots.

"Laparoscopy is the rage today. It's high-tech, innovative and plays well in Peoria, but caution is the watchword when working with babies and children," he says.

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