urology for children

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Undescended Testicles

Although the sex of an embryo is determined at the time of fertilization, the **gonads** (sex organ) do not begin to form into **testicles** or ovaries until around the seventh week of development. Early in development the testicles lie adjacent to the kidneys in the pelvis. By the 3rd month the testicles have traveled down to the level of the **internal ring,** where the abdominal cavity meets the groin area (**inguinal canal**). The testicle maintains this position until the 7th month. Thereafter the testicle passes through the internal ring into the inguinal canal, pushing the lining (**hernia sac** or **processus vaginalis**) of the abdominal cavity ahead of it. The testicle then passes through the **external ring** (where the inguinal canal meets the scrotum) and assumes its normal location in the **scrotum**.

The scrotum provides the necessary environment and temperature control for proper development of the testicles. The ability to keep the testicles a few degrees below body temperature is necessary for normal growth and development of the testicles and for the production of **fertile** sperm. A scrotal location also permits regular **physical examination** of the testicles. This is very important because testicular cancer, although very rare (approximately 2 cases per 100,000 males), is the most common solid tumor in males between the ages of 15 and 35 years old. Such examination is only possible when the testicle can be felt in the scrotum. Having one's testicles in the scrotum is also more cosmetically appealing.

Definitions

An **undescended** or **cryptorchid** testicle is a testicle which lies outside of the scrotum. Undescended testicles are present in approximately 30% of all premature boys, 3% of full term infants and 1% of 1 year olds. An empty scrotum can mean a number of different possibilities regarding the testicle, namely: (1) the testicle may have descended incompletely and may be located in the inguinal canal or at the external ring; (2) the testicle may have passed through the inguinal canal, but rather than passing into the scrotum, it is misdirected into an abnormal (**ectopic**) location, generally somewhere near the groin or scrotum; (3) the testicle may have never developed at all (**agenesis**); (5) the testicle may have twisted off its blood supply prior to birth (**vanishing testicle**); and (6) the testicle may actually have descended into the scrotum and is **retractile**, in that the testicle is intermittently pulled into the inguinal region due to the force of the hyperactive **cremasteric** muscles.

Treatment

Any testicle which is not within the scrotum should be explored and located and, if found to be relatively healthy in appearance should be placed in the scrotum. Surgery is recommended if a testicle has not fully descended into the scrotum by 1 year of age. There is even some data to suggest that surgery may be advisable even as early as 6 months of age because the likelihood of spontaneous descent after 6 months is very low.

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Recent literature suggests that retractile testes that spend the majority of time in the inguinal position are at the same risk for germ cell injury as are undescended testes. We may have the family monitor to see if at random times the testes are up or down. If they report that they are up the majority of the time, we may also recommend surgery.

When the testicle can be felt (palpated) in the inguinal canal or superficial inguinal pouch, surgery (**orchiopexy**) is performed through a small incision in a skin crease in the groin area. Orchidopexy involves freeing up the testicle's blood vessels and vas deferens (**spermatic cord**) to achieve adequate length to place the testicle in the scrotum. Almost always a **hernia sac** is present as well, and this is repaired as part of the procedure. A second smaller incision is then made in the scrotum to make a pouch for the testicle to reside in.

If the undescended testicle appears abnormal or appears badly damaged, it will be removed (**orchiectomy**). The opposite testicle will then be "fixed" into its scrotal position through a separate small scrotal incision. This is designed to prevent the remaining testicle from twisting (**torsion**) which could result in loss of the single remaining testicle.

If the testicle cannot be felt, **laparoscopy** may be performed prior to making any formal incisions. Laparoscopy allows the surgeon to locate the testicle through a scope inserted into the abdominal cavity. Laparoscopy may reveal: (1) an absent testicle which requires no further treatment or exploration; (2) an abnormal testicle which needs to be removed; and (3) a testicle which can either be brought down into the scrotum in one or two separate operations. If only one procedure appears necessary, it will be done in the standard fashion described above under the same anesthesia without waking your child up. If two operations are advisable then the blood vessels to the testicle will be clipped and divided through the laparoscope, and the second stage will be performed approximately 6 months later in standard fashion.

Potential complications of surgery include: (1) bleeding, (2) infection, and (3) unusual pain. Late complications may include a retracted testicle or atrophy of the testicle.

Post-Operative Care & Follow-Up

Your child may experience some pain or discomfort following surgery. Surgery is performed on an ambulatory basis and only rarely requires an overnight stay. Acetaminophen (**Tylenol**) is usually sufficient to keep your child comfortable. If something stronger is needed, a prescription for **codeine** will be provided.

You should not be surprised or alarmed if there is some blood staining of the wound or dressing. You will be advised by your surgeon when your child may resume bathing or showering. Your child should be kept away from bicycles and any straddle toys for 2 weeks from the time of surgery. If your son is of school age, he needs to be excused from gym class for 2 weeks as well. Initial post-operative follow-up should be arranged for 2 weeks from the time of surgery. A 6 month visit is to be arranged as well. Thereafter follow-up will be individualized, however at a minimum a visit should be arranged around the time of puberty to reassess testicular location and growth.

Future Considerations & Implications

Infertility is fairly common, and in fact approximately 15% of all married couples are infertile. Fertility potential is generally impaired in children with undescended testicles. While early orchidopexy does not insure fertility, it hopefully provides an optimum environment for the testicle to achieve its fullest potential. One study found an 80% fertility rate with unilateral undescended testes.

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As stated earlier, testicular cancer is quite uncommon, however this risk is increased in males with histories of undescended testicles. It is unclear at this time if early orchidopexy indeed lessens this increased risk, however some recent studies suggest that it may. Nonetheless, orchidopexy permits easy examination of the testicles on a regular basis. After puberty your child should be taught how to examine his testicles on a monthly basis, just as women are instructed to perform breast self-examination. Regular **self-examination** of the testicles permits early detection should a tumor arise. Since the early stages of testicular tumors are highly curable, the benefits of self-examination are clear.

If your child underwent an orchiectomy rather than an orchidopexy, precautions should be taken to protect his sole remaining testicle. If your son engages in contact sports he should wear a protective cup at all times. Torsion of the remaining testicle, although very unlikely, is possible. Therefore, should your son develop pain in his testicle at any time, immediate medical attention should be obtained.

As your son enters puberty, sexual development will proceed normally even if he has only one testicle. Similarly, having only one testicle will not prevent your son from fathering a child, however as stated previously infertility is more common in men with histories of undescended testicles.

Updated November 2018