



## Undescended Testis

Undescended testis, or failure of the testis to drop into the scrotum, is one of the most common surgical disorders in childhood. This is also called cryptorchidism. This problem occurs in approximately 0.8% to 1.3% of boys. Surgery is the cornerstone of therapy for the correction of true undescended testis.

### Embryology

The testes originate in the abdomen and descend through the inguinal canal and into the scrotum during the eighth and ninth months of gestation. This normal movement of the testicle is caused by hormonal influences and another anatomic structure called the gubernaculum. The gubernaculum can be imagined as a cord that pulls the testicle into the scrotum.

### Retractile Testes

An empty scrotum in a young child may be the result of a retractile testis. These testes descend into the scrotum spontaneously when children are asleep or relaxed and can be manipulated into the low scrotum on examination. Retractile testes are usually on both sides. The testes remain in the scrotum after early adolescence when the testicle becomes heavier and larger. No surgical treatment is indicated.

### True Undescended Testes

More than 80% of true undescended testes occur on one side only. The undescended testis that does not descend into the scrotum spontaneously or after an operation by age 4 years probably will not produce sperm normally. The higher the testis resides above the scrotum, the more abnormal the testes is likely to be. In most cases if a child has an undescended testicle on one side it will descend into the scrotum by 9 months to one year of age. After the first year of life, true undescend is abnormal. Damaging influences causing changes in the undescended testis may begin by 9 to 18 months of age though few changes have been noted in children under one year of age. After the second year, the sperm counts decrease significantly, especially if the testicle is in the abdomen. Damage to the testicle may occur from the higher temperature in the abdomen compared with that of the scrotum. If the undescended testis is not placed into the scrotum at an early age, fertility is likely to decrease. Young children who undergo surgical correction of undescended testis (called orchidopexy) subsequently show an increase in the sperm count. This improvement is mainly seen when orchidopexy is performed by age 2 years.

## Orchiopexy

The major indications for performing surgery to bring the testicles into the scrotum are to avoid the potential problems with fertility, to reduce the likelihood of the testicle twisting and cutting off its blood supply, to repair an associated hernia, to prevent trauma or pain, to provide easier examination for testicular tumor, and for psychological effect and appearance. Surgically the limiting factor for placement of the testis in the scrotum is the length of the spermatic artery, which is placed under tension when the testis is pulled into the scrotum. Any associated hernia is repaired at the time of the orchidopexy. The testis is secured in the low scrotum with sutures. The procedure is performed through a hernia incision that is slightly larger than that used to repair a hernia alone. Another small incision has to be made in the scrotum in order to suture the testicle into place. The operation is performed with the patient under general anesthesia, usually on an outpatient basis.

For high undescended testes, several surgical techniques have been used effectively to move the testicles into the scrotum. The Fowler-Stephens operation provides length for the testicle to reach the scrotum by dividing the spermatic artery and veins high in the abdomen. The testis derives its blood supply entirely from the vessels of the vas deferens. This operation is done in 2 stages. The first divides the artery as mentioned and moves the testicle as close to the scrotum as possible. The second stage 1 or 2 years later and moves the testicle the rest of the way into the scrotum. The waiting period allows the small artery associated with the vas to enlarge and potentially provide better blood supply to the testicle. The initial division of the spermatic vessels of intra-abdominal testes can be accomplished laparoscopically.

Currently, laparoscopy is probably the best way to identify the site of an intra-abdominal testis or document absence of a testis in boys with an empty scrotum and testis that cannot be felt on one or both sides. Occasionally a small shrunken testis may be encountered either in the inguinal canal or within the scrotum. In these cases it may be best to remove that testis after confirming that there is a normal testicle on the opposite side. The surgeon may wait until puberty to remove the shrunken or abnormal testes because it may still produce hormones and be of some advantage. If the testis is absent, a scrotal prosthesis can be placed sometime after puberty.

## Results

Complications from orchiopexy include injury to the vas (approximately 1%), spermatic vascular injuries leading to testicular shrinkage (1% to 8%), and having the testicle pull back toward the abdomen (5% to 10%). Fertility in patients with uncorrected one sided undescended testis has been reported between 30% and 60%. Fertility in patients with one sided descended testis repaired before age 9 years is near 85%, indicating the importance of early surgical repair. For children with untreated two sided undescended testes, 100% are infertile, although testosterone production is often normal. If orchiopexy for two sided undescended testes is performed in children before age 5 years, 50% are fertile, and 30% have normal sperm counts. Patients who undergo two sided orchiopexy before age 2 years are reported to have greater than 65% fertility, whereas patients repaired after age 13 have approximately 12% fertility.

