Introduction

In boys, the testes begin their development in the abdomen. Whilst the baby is growing and developing the testes gradually travel down into the scrotum. This usually happens towards the end of the pregnancy. In some babies, one or both of the testes cannot be felt in the scrotum. The testis will then be undescended. This is also known as cryptorchidism. The testis is usually present somewhere in the lower abdomen. Usually only one of the testes is affected, but on rare occasions, both testes fail to travel to the scrotum**.** The undescended testis is classically found in 1% of boys at the age of 1 year, in 3% of full-term male infants and in one-third of premature babies at birth. **(1)**

The mechanisms of descent of the testes are complex and partially unknown. They classically involve two phases, the first one is the abdominal migration that happens between the 8th and 15th week of gestation. The second phase of the testicular migration is inguinoscrotal and occurs between the 28th and 35th week of gestation. Anything that affects that process of descent may play a role in causing cryptorchidism, although the exact cause is unknown. Proposed possible causes include hormonal abnormalities during gestation or an abnormally developed testis. **(2)**

Whatever mechanism is involved in the failed descent of the testes, the main consequence of a malpositioned testis is testicular maldevelopment. One of the possible factors of testicular maldevelopment of the undescended testis is the intra-abdominal temperature that may lead to an abnormal differentiation of the gonocytes into a spermatogonium**. (3)**

Clinical examination finds that 80% of undescended testis are palpable and sit in the inguinal superficial pouch (30%), the inguinal canal (20%), the upper scrotum (45%) and rarely (5%) the perineum or the thigh and that 20%of undescended testis are non-palpable and sit in the abdominal cavity. Generally radiologic imaging is not

reliable. Ultrasound can help identify a testicle located in the inguinal canal, but is of limited use for intra abdominal testis. MRI and CT scan can be useful for intra abdominal testis. If the testicle cannot be located, laparoscopic techniques may be needed. Laparoscopy involves a tiny video camera that is usually inserted in the abdominal area and navigated into the groin to help locate the testicle**. (4)**

Atrophy and necrosis are found in 3% of non operated undescended testis. Two factors are involved in the disappearance of these testes. The first one is poor quality of the testicular tissue and it is accepted that the higher the testicle sits in the abdomen the more dysgenetic it is. The second one is the presence of a patent processus vaginalis. If the hernial sac is full, it may compress the spermatic vessels causing a testicular necrosis**. (5)**

Infertility is a well-reported consequence of undescended testis. It is reported that histological damage of the testicle is more common after the age of 2 years. This probably explains why the recommended treatment of undescended testis is usually between 6 months and 2 years of age, knowing that a spontaneous testicular migration is theoretically possible during the first 6 months of life**.(6)**

The association of undescended testis and carcinoma in situ (CIS) has been reported although its meaning is also controversial. Adults who have a history of undescended testis have a 1.5–2% risk of developing testicular tumors**. (7)**

The aim of the treatments of undescended testis is to bring the testis into the ipsilateral scrotum before the age of 2 years to preserve the endocrine and exocrine testicular functions. Histological damages of the testis seem to be permanent after 2 years of age. This is the reason why most pediatric surgeons would recommend surgery between 6 and 24 months of age. **(8)**

Because descent of the testicle is partially regulated by hormones, normal descent can sometimes be induced with hormone therapy using human chorionic

gonadotropin (HCG). HCG is the only hormone approved for treatment of undescended testicle in the United States. HCG is administered by injection, generally twice weekly for four weeks. Success rates are best when the testicle is located at the greatest distance from the scrotum**. (9)**

Surgical treatments are well established. The classical inguinal approach of undescended testis implies the opening of the inguinal canal, the dissection of the spermatic cord, the ligation of the patent processus vaginalis that is frequently present and the placement of the testis in the so-called Dartos pouch. **(10)**

Laparoscopy is a revolution as it has two main roles, diagnostic and therapeutic. Laparoscopy allows identification of the gonad, its position and its quality. It also has a major role in the first stage of a two-stage orchidopexy or in orchidectomy. This surgery should be exclusively performed by pediatric surgeons in infants and children.**(11)**

Whatever procedure is chosen to bring the testicle down, these patients need a careful follow-up involving regular self-palpation of the testes after puberty to detect any irregularity related to a testicular tumor. In case of an abnormal palpation of the testis, the patient should be examined by a specialist who will perform a clinical and ultrasound examination of the testes and a measurement of the plasma tumor markers ßHCG and alpha foetoprotein. **(12)**