



ACQUIRED UNDESCENDED TESTES: IMMEDIATE SURGERY OR WAIT AND SEE?

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Abstract

Aim: Undescended testes are a common urological pathology in boys. This condition is categorized according to the examination findings, palpable or non-palpable, and according to the time of diagnosis, congenital or acquired. Orchiopexy is recommended for congenital undescended testes as early as 6 months and up to 18 months at the latest. It is not certain when cases of acquired undescended testes first occur, and most will descend spontaneously into the scrotum. For this reason, when an acquired undescended testis is noticed, the question of whether orchiopexy should be performed immediately or if follow-up is an option becomes important. In this study, we aimed to examine studies on acquired undescended testes in light of the current literature in order to find an answer to this question.

Keywords: Undescended testis, acquired undescended testis, orchiopexy

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Introduction

The estimated prevalence of an undescended testis is 1%–1.5%, and it is the most common urological pathology seen in boys.¹ A primary undescended testis can descend spontaneously into the scrotum during the first six months of life. The occurrence of spontaneous descent varies between 7% and 70%.² There are extensive studies in the literature regarding the relationship between undescended testes and fertility. Factors that might

cause infertility in individuals with undescended testes include the coexistence of germ cell loss, impaired germ cell maturation, Leydig cell reduction, and testicular fibrosis.^{3–5}

In a cohort study of a large patient series that investigated the risk of testicular cancer in men with a history of undescended testes, it was reported that a history of undescended testes was a risk factor for the development

of testicular cancer. The risk of testicular tumors is higher in men who have been operated on for an undescended testis compared to the normal population; the increased incidence of malignancy ranged from 49 in 100,000 (0.05%) to 12 in 1075 (1%).⁶ This is why screening and self-exams are recommended both during and after puberty.⁷ In a 2007 cohort study, 56 of the 17,000 men who had surgery for an undescended testis developed a testicular tumor. Those who underwent surgery before puberty were found to be at less risk. The relative risk of testicular cancer in those who underwent orchiopexy before the age of 13 was 2.2 times that of the Swedish general population, while it increased to 5.4 in those who underwent orchiopexy after 13 years of age.⁸

Undescended testes are categorized as congenital and acquired according to previous testicular position.⁹ Congenital undescended testes cannot occupy a stable position in the scrotum after birth.¹⁰

Skorer (1955) was the first to observe that the testicles, which were thought to be completely descended at birth, could rise to the suprascrotal position over time.¹¹ Although it has been recently accepted that acquired undescended testes are a different clinical entity from congenital undescended testes, in 1984 Hadziselimovic et al. concluded that in addition to congenital undescended testicles, there were also cryptorchid boys with “secondary cryptorchidism after apparent complete descent in infancy.”¹² In addition, Hutson and Goh (1993) stated that “most children over 5 years of age do not have an undescended testis at birth, and the undescended testis seen in these children is an acquired anomaly.”¹³

Acquired undescended testes can be seen in early childhood and late childhood. While the cumulative incidence is 7% at 24 months of age, the prevalence varies between 1%–2% in middle and late childhood.^{14,15} An acquired undescended testis is defined as a palpable undescended testis that was previously known to be in the scrotal position. Spontaneous scrotal descent occurs in 57%–71% of

children with acquired undescended testicles during follow-up.^{16,17}

A relative change and elevation in the position of the testicles as a result of linear growth or late diagnosis of the congenital form are possible causes of an acquired undescended testis.¹⁸ The elevation may result either from partial absorption of the processus vaginalis into the parietal peritoneum or from the fibrous remnant of the processus vaginalis, which connects the testis to the inguinal canal.^{19,20} The acquired undescended testis may be due to spastic cremasteric muscles, which are likely to regress with increased androgen levels at puberty.²¹

As observed by van Brakel et al., testicular volume in children with acquired undescended testes was smaller than testicular volume and contralateral testicular volume in children of similar age.²² In a study conducted in 2017, van Brakel et al. reported that patients with unilateral congenital undescended testicles had higher levels of anti-Müllerian hormone compared to patients with bilaterally acquired undescended testicles.²³ The absence of non-orthotopic gubernacular placement in congenital undescended testes in most children with acquired undescended testes is considered evidence of a different embryological etiology.²⁴

Retractile testes are defined as scrotal testicles that can spontaneously move from the scrotum to the proximal, can be easily lowered manually into the scrotum, and can remain stable in the scrotum for a certain period of time.²⁵ Retractable testes have abnormal cremasteric muscle structural features similar to those of the congenital form.²⁶ It has been reported that approximately 32% of children with retractile testes have acquired undescended testicles in later periods.²⁷ The American Urology Association (AUA) Guideline recommends that children with retractile testes should be followed up with by genital examination at least once a year due to the possibility of proximal displacement of the testicles.²⁸ More than 70% of patients with a retractile testicle do not need surgery.²⁹

The higher incidence of acquired undescended testes in those with a history of prox-

imal hypospadias suggests that a common mechanism, such as abnormal androgen signals, may predispose them to both anomalies.^{30,31}

In a study conducted in 2016, testicular biopsy was performed during orchiopexy in 21 children with acquired undescended testicles. Prematurity (19%) and SGA (9.5%) were seen at a higher rate than those seen in the general population. Of these children, 43% had a family history of undescended testicles. Atypical cells and fibrosis findings were not found in the histopathological examination. The number of tubules containing germ cells and the number of germ cells per tubule were found to be lower than the reference values in the group below 9 years of age and above. The number of tubules containing germ cells and the number of germ cells per tubule were found to be statistically significantly lower ($p = 0.04$) in the group over 9 years old.³²

In the AUA Guidelines, it is recommended that children be referred to the relevant specialist when there is a suspicion of acquired undescended testis in children older than six months. However, there is no follow-up protocol for children with acquired undescended testicles.²⁸ In the European Urology Association (EUA) Guidelines, the acquired undescended testis is defined as a pinched or spontaneously elevated testis after herniography, and there is no specific follow-up protocol on this subject.³³ The age at which testicular displacement from the scrotum to the proximal was most common was investigated in a retrospective study of 340 children who had undergone orchiopexy. In 151 (44.4%) children with acquired undescended testes, testicular displacement was most common between the ages of 5.8 and 11.1 years.³⁴

Treatment

It is still unclear whether follow-up or immediate surgery should be performed when a case of acquired undescended testis is noticed. It is thought that performing orchiopexy for an acquired undescended testis may facilitate the early diagnosis of testicular tumors because it enables the patient to per-

form a future self-examination of the testes. Although there are no large randomized studies of acquired cases, some authors suggest that orchiopexy should be performed as soon as an acquired undescended testis is noticed, as it is likely to lead to positive outcomes for testicular size and fertility.^{9,9,21,35-37}

According to Hutson, to preserve fertility in the acquired undescended testis, surgery should be performed if the testis is in the inguinal canal, and annual follow-up should be performed if it is located in the high scrotal canal.³⁸ In the Netherlands, a wait-and-see protocol is used for acquired undescended testes. Spontaneous descent is expected until puberty, and orchiopexy is applied if descent does not occur.³⁹ In some studies, it was found that testicular volumes were lower in patients with acquired undescended testes who underwent orchiopexy compared to the contralateral testis and the normal control group.^{40,41} In a study comparing 65 adult patients with acquired undescended testicles and 142 control groups in which fertility potential was examined, the unilateral and control group paternity rates were found to be similar. Bilateral and control group paternity rates were statistically significantly against the bilateral group. In addition, paternity rates were found to be similar in those with unilateral and bilateral acquired undescended testicles.⁴²

In a study examining children who underwent orchiopexy in 2020, half of the children whose testicular positions were known from birth were primary, while half were acquired. Congenital, maternal disorders, and hormonal treatment preferences were compared in cases of primary/acquired undescended testes, while the possibility of preterm birth was higher in primary, hormonal treatment preference was found to be higher in acquired cases. In addition, a survey of acquired undescended testis awareness was conducted among pediatricians, urologists, pediatric surgeons, general surgeons, practitioners, and medical students in their final year of study. Among the urologists, 69% found the testes to be displaced upwards in children whose testicles were known previously to be

located in the scrotum. Only 14% of the urologists evaluated the undescended testis—noticed at school age—as acquired, while the rest evaluated it as a delay in diagnosis and screening errors. Few urologists considered follow-up of acquired undescended testis as an option, while 76% stated that surgery should be performed.⁴³

In a study conducted in 2015, the effects of orchiopexy and a follow-up approach on fertility in cases of acquired undescended testes were examined. While 169 children were diagnosed with orchiopexy, wait-and-see was applied to 207 children. In the wait-and-see protocol, children were followed up to Tanner stage P2G2, and orchiopexy was performed if descent did not occur. Inhibin B was found to be higher ($p = 0.03$) and motility lower ($p = 0.03$) in the wait-and-see group of unilateral patients, but successful paternity attempts were similar. Only successful paternity attempts were found to be statistically significant ($p = 0.03$) in bilateral cases, and it was lower in the wait-and-see group. In the multivariate regression analysis, the probability of normal testicular volume (relative risk 3.19; 95% confidence interval [CI] 1.24–8.2, $p = 0.02$) and normal Inhibin B level (relative risk 1.51; 95% CI 1.03–2.22, $p = 0.04$) was higher in the wait-and-see group, and the probability of normal semen motility level (relative risk 0.80; 95% CI 0.66–0.97, $p = 0.02$) was found to be higher in the orchiopexy group. Orchiopexy age was not found to be significant for any parameter in the unilateral and bilateral groups.³⁹

According to Hack et al., the definition of congenital undescended testes should not be limited to within three to six months after birth. Congenital undescended testes may present at birth (early undescended testes) or in midline and late childhood (mid-undescended testes and late-undescended testes, respectively). According to Hack et al., while surgery is required for the early-undescended testis, wait-and-see surgery is a more appropriate option in cases of late-undescended testes.⁴⁴

In studies on acquired undescended testes, generally only those with palpable undescended

testes were included.^{22,39,45} In a retrospective study conducted by Plas et al. (2013), 155 children were included. The testicular position of 42 of the 181 acquired undescended testes cases was unknown. All 139 testicles with known testicular positions were palpable.⁴⁰ In patients with acquired undescended testes, there is no clear literature that investigates palpable/non-palpable status in a large patient series. However, based on Plas et al.,⁴⁰ the acquired undescended testis tends to be palpable. Although we do not have clear data on the nonpalpable status of acquired undescended testes, since there is no different diagnosis and treatment protocol for acquired undescended testes in the guidelines, we can say that the use of diagnostic laparoscopy in acquired undescended testes is just as it is in primary undescended testes. The use of diagnostic laparoscopy in cases of nonpalpable testes is strongly recommended in both the AUA Guidelines and the EAU Guidelines.^{28,33} Diagnostic laparoscopy is frequently used to diagnose intra-abdominal testes. It is also the most accurate method of diagnosing intra-abdominal testis.⁴⁶ It allows orchiopexy or orchiectomy procedures to be performed using the same approach.⁴⁷

Guidelines

According to the Nordic Consensus, when a congenital undescended testis is noticed, it should be referred to a urologist or pediatric surgeon for a period not exceeding six months. If the testis has descended into the scrotum by six months of age or if the testis is retractile, the family should be told that annual follow-up is required until puberty and that there is a possibility of relapse. If the testis does not descend by six months, surgical correction should be performed by one year of age. Regardless of the primary/acquired distinction, if an undescended testis is detected at any age after six months, the patient should be referred to urologists or pediatric surgeons for surgery.

According to the AUA Guidelines, regardless of the primary/acquired distinction, orchiopexy is recommended in prepubertal

boys with palpable undescended testicles. It is recommended that children with prepubertal nonpalpable testes be examined under anesthesia, and if still not palpable, diagnostic laparoscopy is recommended.²⁸

In the EUA Guidelines, it is recommended that retractile testes should not be treated medically or surgically, and should be followed up annually until puberty. Moreover, it is recommended that children with undescended testicles should undergo orchiopexy before 12 months and up to 18 months of age at the latest, regardless of primary/acquired distinction.³³

There is no special protocol in the EAU and AUA Guidelines regarding acquired undescended testis cases diagnosed in the postpubertal period. The AUA Guidelines recommend that “In boys with a normal contralateral testis, surgical specialists may perform an orchiectomy (removal of the undescended testis) if a size has a normal contralateral testis.”²⁸ In the EAU Guideline, a recommendation was made to “Inform the patient/caregivers about the increased risk of a later malignancy with an undescended testis in a post-pubertal height or older and discuss removal in case of a contralateral normal testis in a scrotal position” (level of evidence, 3; strength rating, weak).³³ In light of these guidelines, it is recommended to consider the option of orchiectomy in cases of acquired undescended testis noticed in the postpubertal period and to discuss this issue with the patient/relatives.

Conclusion

In order to diagnose acquired undescended testes, it is necessary to check that the testicles are in the scrotum at any point after birth. In studies on this subject, the positioning of the testes in the scrotum is based mostly on the anamnesis of the parents. For this reason, there is always the possibility that the cases that were initially thought to be acquired undescended testes are actually late diagnosed primary cases. According to some studies, although follow-up seems to be a good option in cases of acquired undescended testes,

medicolegal guidelines guide us. Guidelines recommend surgical treatment in all cases diagnosed before puberty. In addition, there is neither an algorithmic approach to the acquired undescended testis in the guidelines nor suggestions about who can be followed and who should be operated on as soon as the diagnosis is made. If the wait-and-see option is preferred, it seems appropriate to discuss this in detail with the parents and perhaps obtain a consent form. There is a need for randomized, prospective studies on this subject with a large number of patients, where testicular localization is documented from birth and follow-up continues until adulthood. In future studies, histological, laboratory, imaging, and genetic studies should be performed. Thus, it will be possible to clarify who is suitable for follow-up and who needs orchiopexy at the time of diagnosis, and perhaps nomograms can be created.

Moreover, unfortunately, there is a huge knowledge gap in the literature in terms of revascularization for these patients, especially surgical revascularization. On the interventional coronary revascularization side, Autoimmune diseases have been identified as a risk factor for major cardiac events, repeated revascularization due to restenosis, and mortality⁵⁻⁷. Ma et al.⁶ conducted a meta-analysis study

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