Testing the undescended testis

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Citation for published version (APA):

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Nonoccurrence of torsion of the acquired undescended testis

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ABSTRACT

Background
It has been speculated that a non-scrotal position of the testis predisposes to torsion. The aim of this study was to evaluate the risk for testicular torsion in acquired undescended testis while at a non-scrotal position.

Methods
During a 17 year period (1996-2012) all patients referred to the outpatient clinic with an acquired undescended testis were requested to participate in a long-term evaluation with an annual follow-up during a wait-and-see policy until puberty. Possible testicular torsion during this period was assessed by questionnaires and physical examinations.

Results
In total 458 patients, with 544 acquired undescended testes, were included. During 2664 testis-years of follow-up (mean ± SD; 4.9 ± 3.3 years), none of the patients developed a torsion of the testis; one patient presented with a torsion of the appendix testis.

Conclusion
Testicular torsion of the acquired undescended testis appears to be rare.
INTRODUCTION

Undescended testis (UDT) occurs in 1% of boys and is associated with impaired spermatogenesis and an increased risk of testicular malignancy.¹⁻³ Orchidopexy is often performed aiming for preserving germinal epithelium but also because of a presumed increased risk of torsion of the testis located in the groin area.⁴ Williamson et al estimated testicular torsion would be ten times more common in undescended than in normal scrotal testes.⁵ Others describe it as a relatively rare phenomenon and underline the need of more evidence of the incidence of torsion of the UDT.⁶ UDT may be manifested at birth as congenital cryptorchidism or later in childhood as acquired UDT. For acquired UDT, we have followed a ‘wait and see’-policy, awaiting spontaneous descent at puberty. Therefore, we were able to observe the occurrence of testicular torsion in boys with acquired UDT situated in the groin for a longer period of time. We hypothesize that torsion of the acquired UDT is rare.

MATERIALS AND METHODS

Study population
This report concerns part of a survey on boys referred to our outpatient clinic for non-scrotal testis. Further details of this survey can be found in previous publications.⁷,⁸ During the period 1996 – 2012, all patients referred to the outpatient clinic and diagnosed with acquired UDT were requested to participate in a long-term evaluation. Prepubertal surgical intervention was actively withheld, in accordance with the Dutch consensus on non-scrotal testes.⁹ Pubertal orchidopexy was only performed in case of non-descent.
We included all boys in whom acquired UDT was diagnosed, uni- or bilaterally. Boys were excluded when the UDT had developed after previous inguinoscrotal surgery or if an orchidopexy at diagnosis was performed.

Study design
At annual follow-up a questionnaire was used that included inguinal or scrotal complaints and inguinoscrotal surgery. Physical examination for pubertal stage and
testis position and testicular ultrasound were performed. Data were managed with SPSS, version 20.0. Testis-years of follow-up for all acquired UDTs were calculated from referral until spontaneous descent, pubertal orchidopexy (in cases of non-descent) or the end of the study, December 2012.

**Definitions**

UDT was defined as a testis which could not be manipulated in a stable scrotal position and further tension on cord structures was painful. Acquired UDT is defined as a UDT previously situated in the scrotum. The scrotal position should have been documented at least twice by youth health care physicians.7

**RESULTS**

**Study population**

During a 17 year period (1996-2012), 504 boys were diagnosed with acquired UDT at our outpatient clinic. We excluded 46 boys for further analysis, due to previous inguinoscrotal surgery (hernia inguinalis repair n=13, orchidopexy n=16), 13 boys/parents preferred an orchidopexy directly after diagnosis and 4 boys were lost to follow-up after the first visit. We included 458 boys with a mean age at referral of 9.2 ± 2.4 years. Unilateral UDT was present in 372 patients (190 right-sided, 182 left-sided) and 86 were found to have bilateral acquired UDT. During the ‘wait and see’-period, in 235 boys (280 testes) spontaneous descent had occurred. In 65 boys (74 testes) no spontaneous descent had occurred and pubertal orchidopexy was performed. At the end of the study 158 boys (190 testes) were still in follow-up, with a mean age of 9.6 ± 2.2 years (Figure 1). The 458 included patients, with 544 acquired UDT, had a mean follow-up of 4.9 ± 3.3 years per UDT which resulted in 2664 testis-years of follow up.

**Torsion of acquired UDT**

During the ‘wait and see’-period 2 patients had presented with inguinal pain at the site of the UDT and were suspected for a testicular torsion. Both underwent a surgical exploration. In one patient (age 10 years) there were no abnormalities found, in the other patient (age 11 years) a torsion of the appendix testis was found. In both cases an orchidopexy was performed.
DISCUSSION

During 2664 testis-years of follow-up no torsion of the acquired UDT was seen and one torsion of the appendix testis. These data show us that testicular torsion of the acquired UDT is rare.

Surgical correction at the time of diagnosis is usually recommended for acquired UDT.\textsuperscript{10,11} The presumed greater risk of testicular torsion is one of the arguments to advocate orchidopexy at diagnosis for acquired UDT.\textsuperscript{4,12}

In this study a conservative attitude for acquired UDT was followed, thus restricting orchidopexy to cases of non-descent at puberty. Spontaneous descent occurred in 78%. As no torsion of the acquired UDT was seen in 2664 testis-years of follow-up, we question whether the risk of torsion should be an argument for surgical correction at the time of diagnosis.

Furthermore, operative treatment of acquired UDT has also negative consequences. Ultrasonographic studies show abnormalities in the majority of the orchidopexied testes\textsuperscript{13} and orchidopexy may lead to complete atrophy in 1-5 %.\textsuperscript{14} Further, recently two studies showed a significantly smaller testicular volume in boys and adolescents after orchidopexy at diagnosis of acquired UDTs compared to normative values.\textsuperscript{15,16}

In addition, the psychological and economical impact of surgery should be taken into account as in 3 out of 4 cases of acquired UDT surgery seems to be unnecessary.
Testicular torsion has a bimodal age distribution, occurring either soon after birth or more commonly at puberty. In the United States the estimated incidence of testicular torsion for males aged 1 to 25 years is 4.5 cases per 100,000, and 8.6 cases per 100,000 male subjects per year, aged 10 to 19 years.17 Zhao et al found an estimated yearly incidence of testicular torsion for males younger than 18 years of age of 3.8 per 100,000.18 The incidence of testicular torsion is believed to be higher in patients with UDT compared to normally descended testes.4,19 This belief is based on retrospective studies analyzing the percentage involving UDT in all cases of torsion, not further specified for congenital or acquired. For example, a 25 year review of testicular torsion in Bristol described a total of 670 cases of testicular torsion. Among these, 41 (7%) occurred in UDT, age range from 2 months to 34 years. The salvage rate of torsion in UDT was poor, 70% coming to orchidectomy.20

In this prospective study, no torsion of the acquired UDT during 2664 follow-up years was seen. We studied acquired UDT while the increased risk described in the literature may concern mostly congenital UDTs. Both entities may differ in pathophysiology.21,22 The mechanism of torsion in UDT remains unclear, it may be related to an abnormal contraction of the cremaster muscles causing spermatic twist or a greater broadness of the testis compared to its mesentery.23

In our survey, one patient was diagnosed with a torsion of the appendix of the UDT. As far as we could ascertain there are no data on the risk of torsion of the appendages in UDT. Recently the first case-report of a torsion of the appendix testis in a UDT has been described.24

Whether rare or not, it is essential to underline the importance of early recognition, diagnosis and treatment of torsion in any child presenting with an empty hemiscrotum and concerning symptoms. The case reports regarding torsion of UDT mainly focus on the poor salvage and describe boys with -most likely congenital- UDTs, with a salvage rate of 10% to 50%.12,25-27

Our findings should be interpreted in light of their limitations. First, the size of our cohort in combination with the low incidence of testicular torsion is an important limitation. Incidences of rare conditions as testicular torsion should preferably studied in very large cohort studies. Otherwise, due to our ‘wait and see’-policy, including annually follow-up, we have a unique complete database of a relatively large cohort of acquired UDTs. Secondly, no control group was available. A case-control study would give more insight in the true incidence of testicular torsion in acquired UDT compared
to scrotal testis. At last, as we studied the acquired UDT during the non-scrotal period, the question remains whether a spontaneously descended acquired UDT is at greater risk for torsion.

In our survey we were able to observe a large cohort of boys with UDT. Nevertheless, in order to draw a firm conclusion about the risk of testicular torsion in boys with acquired UDT compared to boys with normally descended testes, a case-control study should be performed with a long-term follow-up of sufficient boys with acquired UDT and boys with scrotal testes.

**CONCLUSION**

Our study shows that torsion of acquired UDT while at a non-scrotal position seems to be rare. In addition, we dispute that the risk of torsion is an argument to orchidopexy an acquired UDT.
Chapter four

References