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Review Article

Management of undescended testes: European Association of Urology/European Society for Paediatric Urology Guidelines

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Summary

Context
Undescended testis is the most common endocrinological disease in the male newborn period. Incidence varies between 1.0% and 4.6% in full-term neonates, with rates as high as 45% in preterm neonates. Failure or delay of treatment can result in reduced fertility and/or increased testicular cancer risk in adulthood.

Objective
To provide recommendations for the diagnosis and treatment of boys with undescended testes which reduce the risk of impaired fertility and testicular cancer in adulthood.

Evidence acquisition
Embase and Pubmed were searched for all relevant publications, from 1990 to 2015 limited to English language. Data were narratively synthesized in light of methodological and clinical heterogeneity. The risk of bias of each included study was assessed.

Evidence synthesis
There is consensus that early treatment, by 18 months at the latest, for undescended testes is mandatory to avoid possible sequelae regarding fertility potential and cancer risk. The current standard therapy is orchidopexy, while hormonal therapy is still under debate. However, in some individuals the successful scrotal placement of previously undescended testes may not prevent potential negative long-term outcomes regarding fertility and testicular malignancy.

Conclusions
There is good evidence for early placement of undescended testes in the scrotal position to prevent potential impairment of fertility and reduce the risk of testicular malignancy. No consensus exists on the various forms of hormonal treatment, which are assessed on an individual basis.

Methodology

The scientific literature on congenital diseases is limited. Generally, the level of evidence is poor, with most studies being retrospective with very heterogenous and not well-defined patient groups and poor stratification of quality. These guideline recommendations were developed by the European Association of Urology (EAU)/European Society for Paediatric Urology (ESPU) Guidelines Committee to provide a practical approach for treatment of children suffering from undescended testes. The Embase and Pubmed databases were searched for all relevant publications from 1990 to 2015. The terms cryptorchidism, undescended testis, hormonal treatment, orchidopexy, laparoscopy, testicular cancer, and fertility were used. At least two reviewers screened all 908 articles independently. Disagreement was resolved by a third party. A total of 73 full-text articles were included in the final version. Key historical articles were also included, for example [1]. The criteria used for level of evidence (LE) and grade of recommendation (GR) were defined according to the widely adopted classification system from the Oxford Centre for Evidence Based Medicine [2] (Tables 1 and 2).

Background

Cryptorchidism or undescended testis is one of the most common congenital malformations in male neonates and is related to a multifactorial process. Incidence varies and depends on

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Table 1 Summary of evidence.

	LE
An undescended testis justifies treatment early in life to avoid loss of spermatogenic potential.	2a
A failed or delayed orchidopexy may increase the risk of testicular malignancy later in life.	2a
The earlier the treatment, the lower the risk of impaired fertility and testicular cancer.	2a
In unilateral undescended testis, fertility rate is reduced whereas paternity rate is not.	1b
In bilateral undescended testes, fertility and paternity rates are impaired.	1b
The treatment of choice for undescended testis is surgical replacement in the scrotum.	1b
The palpable testis is usually treated surgically using an inguinal approach.	2b
The non-palpable testis is most commonly approached laparoscopically.	2b
There is no consensus on the use of hormonal treatment for testicular descent.	2b

Table 2 Recommendations.

	LE	GR
Do not offer medical or surgical treatment to boys with retractile testes but closely follow-up until puberty.	2a	A
Offer surgical orchidolysis and orchidopexy before the age of 12 months, and by 18 months at the latest.	2b	B
Evaluate male neonates with bilateral non-palpable testes for possible DSDs.	1b	A
In cases of non-palpable testes and no evidence of DSDs, offer laparoscopic intervention because of its excellent sensitivity and specificity in identifying an intra-abdominal testis, as well as the possibility for subsequent treatment in the same session.	1a	A
Do not routinely offer hormonal therapy, either in an adjuvant or neo-adjuvant setting for testicular descent. Patients have to be evaluated on an individual basis.	2a	C
In cases of bilateral undescended testes, offer endocrine treatment to possibly improve further fertility potential.	4	C
For an undescended testis in a post-pubertal boy or older, with a normal contralateral testis, discuss removal with the patient/parents because of the theoretical risk of a later malignancy.	3	B

gestational age, affecting 1.0—4.6% of full-term and 1.1—45% of preterm neonates. Despite spontaneous descent within the first months of life, nearly 1.0% of all full-term male infants still have undescended testes at 1 year of age [3]. This congenital malformation may affect both sides in up to 30% of cases [4]. In newborn cases with non-palpable or undescended testes on both sides and any sign of disorders of sex development (DSDs), such as concomitant hypospadias, urgent endocrinological and genetic evaluation is required [5].

Classification

The term cryptorchidism is most often used synonymously for undescended testes. The most useful classification of undescended testes is into palpable and non-palpable testes, and clinical management is decided by the location and presence of the testes (Fig. 1). Approximately 80% of all undescended testes are palpable [6]. Whether the condition is congenital or acquired can only be decided during a neonatal physical examination, documenting that the gonad is not in a proper scrotal position, compared with a testicle outside its normal position later in life, that was documented as being scrotal after birth. Acquired undescended testes can be caused by entrapment after herniorraphy or spontaneously referred to as ascending testis.

Palpable testes include true undescended testes and ectopic testes. Non-palpable testes include intra-abdominal, inguinal, absent, and sometimes also some ectopic testes. Most importantly, the diagnosis of a palpable or non-palpable testis needs to be confirmed once the child is under general anaesthesia, as the first step of any surgical procedure for undescended testes.

Palpable testes

Undescended testes

A true undescended testis is on its normal path of descent but is halted on its way down to the scrotum. Depending on