

# Practical approach to evaluating testicular status in infants and children

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## Abstract

**Objective** To review the differences between normal, retractile, ectopic, ascended, and undescended testes and to describe the optimal way to perform a testicular examination to distinguish one from the other, as well as to demonstrate that ultrasound imaging is not necessary and to clarify when to consider specialist referral.

**Sources of information** This paper is based on selected findings from a MEDLINE search on undescended testes and orchiopexy referrals, and on our experience at the Urology Clinic at the Children's Hospital of Eastern Ontario in Ottawa, including review of referrals to our clinic for undescended testes and the resultant findings of normal variants versus surgical cases. The MeSH headings used in our MEDLINE search included *undescended testicle*, *retractile testicle*, *ectopic testicle*, *ascended testicle*, *referral and consultation*, and *orchiopexy*.

**Main message** An *undescended testis* is defined as the true absence of one testis (or both testes) from normal scrotal position. Ectopic and ascended testes will likewise be absent from the scrotum, the latter having been present at one point in development. Differentiating among testicular examination findings is important, as descended and retractile testes are managed conservatively, while prompt surgical intervention should be offered for ascended, ectopic, and undescended testes. Uncertainty surrounding the diagnosis of an undescended testis causes anxiety, might lead to unwarranted imaging, and might increase the wait list for specialty assessment. For this reason, avoidance of ultrasound in the evaluation of undescended testes was included in the recent Choosing Wisely Canada campaign. We seek to clarify the physical examination findings in the evaluation of possible undescended testes, the suggested referral parameters, and the subsequent management.

**Conclusion** Undescended testes and their variants are common. As decision for referral is based on the primary care physician's physical examination findings, we clarify distinguishing between normal and abnormal findings on testicular examination to aid in appropriate referral for subspecialist evaluation. Consultation, if needed, should be sought at 6 months' corrected gestational age, or at detection if later than 6 months, without delay for ultrasound imaging, as surgical management is recommended for those patients with undescended, ectopic, or ascended testes.

Family physicians represent the front line in health care and are most likely to make the initial discovery of undescended testes (UDT). Distinguishing normal from abnormal testicular examination findings will facilitate appropriate referrals, allowing for prompt intervention as needed. At our institute, review of our UDT referral data from 2008 to 2012 was recently undertaken. We identified 894 eligible patients. In 77% of cases the urologist was able to palpate the testis: 51% had a normally positioned or retractile testis and 26% had a

## EDITOR'S KEY POINTS

- Undescended testes and their variants are common. Indications for urologic consultation include any nonpalpable testis or undescended testis after 6 months' corrected gestational age, ectopic location of a testis, and an ascended testis.
- Ultrasound imaging before referral is not recommended, as determination of undescended testes is a physical examination finding, and imaging has been shown to be a poor indicator of true testicular position.
- At the authors' clinic, about half of referred patients had normally positioned or retractile testes and could likely have been managed by continued observation at well-child visits. Further, 32% had undergone ultrasound imaging, and in 61% of cases the ultrasound results did not correlate with the urologist's findings. Improving management of such patients would prevent considerable parental anxiety, reduce costs from unnecessary imaging, improve wait times, and facilitate prompt surgical correction when appropriate.



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palpable undescended testis.<sup>1</sup> These findings demonstrate there is ongoing uncertainty regarding the diagnosis and management of UDT, and we aim to provide clear information in this regard.

Improving our management of these patients would prevent considerable parental anxiety, reduce costs from unnecessary ultrasound imaging, ameliorate wait times for subspecialist referrals, and facilitate prompt surgical correction of UDT in appropriate cases within the optimal recommended window of 6 to 12 months of age.

## Case description

A 2-year-old boy is brought to your office by his parents. They are anxious because they have not recently seen his right testicle down in the “sac.” Upon taking a history, you find out that they occasionally see the testis down in the scrotum in a warm bath. The parents do not recall any mention of a genital abnormality at birth. The patient is otherwise healthy.

## Sources of information

The paper is based on selected findings from a MEDLINE search for literature on undescended testes and orchiopexy referrals, and on our experience at the Urology Clinic of the Children’s Hospital of Eastern Ontario in Ottawa. The MeSH headings used in our MEDLINE search included *undescended testicle*, *retractile testicle*, *ectopic testicle*, *ascended testicle*, *referral and consultation*, and *orchiopexy*. The literature on this topic consists of level II (cohort studies) and level III (retrospective reviews) evidence.

## Main message

**Natural history of testicular descent.** An undescended testis is one of the most common congenital anomalies, occurring in 1% to 4% of full-term and 1% to 45% of preterm male neonates.<sup>2</sup> It is a component of many congenital syndromes; however, by far most cases are isolated. The pathogenesis of isolated cryptorchidism is most likely multifactorial, involving both genetic and environmental risk factors. Testicular descent begins as early as 5 weeks’ gestation, while transabdominal descent is finished by 10 weeks’ gestation and inguinoscrotal descent is complete at 20 to 28 weeks’ gestation.<sup>3</sup>

### Classification

**Normal scrotal position:** When in normal position, the testes are positioned at or below the midpoint of the scrotum without palpable tension on the spermatic cord.

**Retractile testis:** A retractile testis is found in the upper scrotum or lower inguinal canal but can be positioned in the scrotum without spermatic cord tension; it remains there for a short period of time but intermittently resides in the groin.

**Palpable undescended testis:** This is when one testis (or both testes) is not in the normal scrotal position during examination; the testis can be clearly identified and can be brought into the upper scrotum but with persistent tension on the cord or immediate retraction upon release of the cord.

**Acquired undescended testis (also known as ascended testis):** In this case, a previously documented normally positioned testis is palpable but found to be undescended.

**Ectopic undescended testis:** An ectopic testis is palpable but not located along the line of normal descent. These testes are always found distal to the external inguinal ring. The most common location is the superficial inguinal pouch (anterolateral to the external ring); more rarely they are in a prepubic (dorsal to penis), femoral, perineal, or contralateral scrotal position.

**Nonpalpable undescended testis:** This is when one testis (or both testes) is not in the normal scrotal position during examination and the testis cannot be clearly identified in any position.

**Diagnosis.** The male genital examination can be challenging to teach and difficult to master. Multiple studies have documented limited practitioner comfort with this examination.<sup>4</sup> Thus, it could be expected that this unfamiliarity, coupled with the added difficulty of the natural anxiety a child often experiences during such an examination, complicates the determination of testicular position.

Testicular position is best determined in the supine and frog-legged position (**Figure 1**). Abduction of the thighs contributes to dampening the natural cremasteric reflex, as well as avoiding the resultant testicular elevation from inadvertent contact with the inner thigh during scrotal examination. Patient distraction and relaxation are helpful, and provider and patient comfort will assist with this. The examination room should be warm, and the child’s pants and underwear should be removed completely.

Careful observation should begin before the examination. First, the examiner’s nondominant hand is used to retract the skin of the suprapubic area upward. In many cases the testis will become visible in the scrotum with this maneuver alone. If not, the examiner can then use the nondominant hand to gently apply pressure sweeping in a cranial to caudal direction to help encourage descent of the testis, while the dominant hand waits to receive or trap the testicle in its lowest possible location. Occasionally, a testis can be felt to “pop” under the fingertips of the nondominant hand when just superior to the inguinal ligament, indicating a testis near the internal ring (ie, a palpable undescended testis). Repeated examination can be helpful.

Examination documentation should include testicular palpability, position, mobility, size, and any associated findings such as hernia or hydrocele. Indications for referral for consultation are outlined in **Box 1**.

**Figure 1. Demonstration of proper positioning to facilitate testicular examination:** *The patient is frog-legged and there is gentle upward traction applied to the suprapubic area.*



### Box 1. Indications for referral for consultation

Indications for urologic consultation regarding an undescended testis include the following:

- any nonpalpable testis,
- an undescended testis after 6 months' corrected gestational age,
- ectopic location of testis, and
- ascended testis

### Management of testes, classified by position

**Normal scrotal position:** Normally positioned scrotal testes require nothing more than annual examination in childhood as part of a routine well-child visit; however, it is important that these examinations continue throughout childhood, as there is evidence that 1% to 3% of testes might become ascended after normal newborn examination findings or after previous spontaneous descent.<sup>2</sup>

**Retractile testis:** Testes classified as *retractile* require regular repeat examinations. Testes that are quite retractile can be difficult to differentiate from UDT. Testes that rarely show spontaneous descent into the scrotum or that do not remain in position after manipulation must be watched more closely.<sup>5,6</sup> Retractile testes should be monitored until puberty, as rarely testes can ascend or become trapped in the inguinal canal, leading to acquired (also known as *ascending*) cryptorchidism. The causes of this

might include inadequate spermatic vessel growth, tethering by the processus vaginalis, or inadequate postnatal testosterone surge to stabilize the testis.<sup>7</sup>

Testes that are truly retractile are believed to be a variant of normal testis position and do not require surgical treatment or specialist evaluation. If there is doubt, however, a more experienced specialist can confirm the appropriateness of continued observation versus the need for surgical intervention. The testes can be expected to remain consistently in a dependent scrotal position by puberty.

**Undescended testis (palpable and nonpalpable):** Undescended testes (palpable and nonpalpable) require prompt subspecialist referral at the corrected gestational age of 6 months, or upon detection if later. Spontaneous descent is unlikely after 6 months of age, so referral should not be further delayed. The Choosing Wisely Canada campaign supports this timeline, as this allows for surgical correction within the range of 6 to 12 months of age, which might optimize spermatogenic functions.<sup>8</sup>

Ultrasound imaging before referral is not recommended, as determination of UDT is a physical examination finding, and imaging has been irrefutably shown to be a poor indicator of true testicular position.<sup>9</sup> Owing to the high number of referrals for UDT that include a completed inguinoscrotal ultrasound, the Choosing Wisely Canada campaign has advised as one of its educational mandates that primary care providers not order ultrasound for UDT before referral.<sup>8</sup>

Ultrasound imaging data were included in the review of our UDT referral data from 2008 to 2012. Of the 894 eligible patients that were identified, 32% had accompanying inguinoscrotal ultrasound. In 61% of cases the ultrasound results did not correlate with the urologist's findings. Thus, review of our referrals showed that ultrasound was unhelpful, or even misleading, in most cases.


After urologic examination, the undescended testis is determined to be nonpalpable or palpable, and this will guide surgical intervention, as an inguinal approach is used for palpable UDT and laparoscopic exploration is required for nonpalpable UDT.

### Case resolution

You examine the 2-year-old boy in a supine frog-legged position. You first retract the scrotum upward but the testis is not visible. Next, you sweep downward in the groin with your nondominant hand and then you are able to palpate the right testis in the low inguinal canal and can easily sweep it down into a midscrotal location. You complete the rest of your examination and then recheck the right testis. It is still in an appropriate location so you conclude the testis is retractile and plan to reexamine the genitals at the patient's

next well-child visit. If the testis cannot be brought down into a descended position at future follow-up examinations, or the diagnosis of retractile testis becomes unclear, urologic consultation should then be sought without ultrasound evaluation.

## Conclusion

Undescended testes and their variants are common. Diagnosis and decision for referral are based on physical examination findings. Surgical management is recommended for those patients with undescended, ectopic, or ascended testes. Consultation should be sought directly at 6 months' corrected gestational age, or at detection if later than 6 months, without ultrasound imaging. 

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### Contributors

Both authors contributed to the literature review and interpretation, and to preparing the manuscript for submission.

### Competing interests

None declared

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