

Evaluation and Management of the Undescended Testis in Puerto Rico: A Single Surgeon's 10 Years of Experience

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Objective: Cryptorchidism is an abnormality of the male genitourinary tract in which one or both testes fail to descend into the scrotum. The American Urological Association (AUA) clinical guidelines for the evaluation and treatment of cryptorchidism were recently published. We reviewed our experience with the evaluation and management of our patients and examined our findings with respect to the AUA and European Association of Urology (EAU) guidelines.

Methods: Data were obtained from pediatric patients who underwent a surgical intervention for an undescended testis from 2007 through 2017 at HIMA Hospital and the University Pediatric Hospital (both in Puerto Rico); all the surgeries were performed by the same surgeon. A total of 754 patients were identified; 142 patients were excluded due to lack of follow-up data (N = 612). The data obtained included age, testes locations, radiologic and surgical findings, and postoperative results.

Results: At their initial evaluations, a large proportion of the patients (46.4%) came accompanied with radiographic imaging. These findings were consistent with those of the physical examination in 58.5% of the patients and with the surgical findings in 63.1% (sensitivity 77.9%, specificity 45.8%). Our data showed that the median referral age was 24 months, which suggests that there was a significant delay in diagnosis. At the time of surgery, the average age of the patients who required an orchiectomy was 3.93 years, while those who underwent an orchiopexy had an average age of 3.28 years.

Conclusion: Our data reveal that, despite its lack of usefulness, radiologic imaging continues to be included in the diagnostic workups of children newly identified with cryptorchidism in Puerto Rico. In addition, and contrary to the guidelines, there tends to be a significant delay in treatment with surgical intervention. It is important to continue to educate our referring physicians on the AUA and EAU guidelines in order to create awareness and encourage the proper diagnostic and treatment approach for cryptorchidism. [*PR Health Sci J* 2019;38:269-271]

Key words: Cryptorchidism, Undescended testicle, Sonogram, Ultrasound

Cryptorchidism is an abnormality of the male genitourinary tract, in which one or both testes fail to descend into the scrotum by 4 months of age. It is the most common genitourinary anomaly in male infants and is seen in 1 to 3% of full-term male infants and up to 30% of premature infants (1,2). Recent reports have questioned the need for routine imaging in the workup for cryptorchidism and the ideal timing for referral. The American Urological Association (AUA) clinical guidelines for the evaluation and treatment of cryptorchidism were revised in 2014, with the purpose of providing a consensus to primary care providers as well as to urologists. Physician counterparts affiliated with the European Association of Urology (EAU) also revised and released their cryptorchidism guidelines in March 2013. These new guidelines highlight the importance of early

referral to surgical specialists and stress the fact that a primary care provider should not, prior to said referral, perform an ultrasound (or any other imaging modality) in the evaluation of a boy with cryptorchidism (3). Cryptorchidism is a clinical diagnosis that requires only a physical exam by an experienced

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pediatric clinician (4). Ultrasound imaging, or any other imaging modality for that matter, will not have an impact on clinical decision-making and represents only an unnecessary economic expense.

We reviewed our experience with the evaluation and management of our patients and assessed our findings with respect to the current AUA and EAU cryptorchidism guidelines.

Methods

We reviewed our IRB-approved database of 754 pediatric patients who underwent surgical intervention for an undescended testis from 2007 through 2017 at HIMA Hospital and at the University Pediatric Hospital (both in Puerto Rico) all the surgeries were performed by a single pediatric urologist (MPB). Demographics were obtained from medical charts. The surgeon performed a physical exam of the scrotum during each patient’s initial visit. The results of any imaging studies performed were also obtained.

Of the 754 patients who were identified to be included in our study, 142 were excluded due to a lack of follow-up data (N = 612). The data obtained included age, testes locations, radiologic findings, surgical findings, and postoperative results.

Results

A total of 612 patients with an undescended testis and having an average age of 4.32 years (median age of 24 months) were included for analysis. Bilateral cryptorchidism was identified in 66 patients (11%). Cryptorchid testes were palpable in 407 patients (66.5%) and non-palpable in 205 (33.5%) patients.

At their initial evaluations, a large proportion of the patients (46.4%) came accompanied with radiographic imaging. These findings were consistent with those of the physical examination in 58.5% of the patients and with the surgical findings in 63.1%. Table 1 compares ultrasound findings with physical-exam findings in the patients with cryptorchidism. Testes that were identified by ultrasound were palpable on physical exam in 141 out of 199 cases, which corresponds to a positive predictive value of 70.8%. Alternatively, testes that were not identified by ultrasound were not palpable on physical exam in 49 out of 89 cases, corresponding to a negative predictive value of 55%. Overall, ultrasound imaging had a sensitivity of 77.9% and a specificity of 45.8% in terms of identifying cryptorchid testes in our cohort.

Table 1. Performance of ultrasound in the evaluation of Cryptorchidism

	Palpable testis on PE	Non-Palpable testis on PE	
+ US	141	58	Sensitivity: 77.9%
- US	40	49	Specificity: 45.8%
			PPV: 70.8%
			NPV: 55%

US: ultrasound; PE: physical examination; PPV: positive predictive value; NPV: negative predictive value

At the time of surgery, the average age of the patients who required an orchiectomy was 3.93 years, while those who underwent an orchiopexy had an average age of 3.28 years. Excellent surgical outcomes were seen for both palpable and non-palpable testes.

Discussion

Cryptorchidism is the most common genitourinary anomaly in male infants (1,2). Normal testicular migration begins in the 8th week of gestation: The testes descend from the mid-abdomen towards the internal inguinal ring and scrotum. At 28 weeks, the testes pass through the internal inguinal ring, inguinal canal, and external inguinal ring, finally reaching the scrotum by 36 weeks of gestation. Cryptorchid testes may be absent, undescended, retractile, or ascending. Also known as undescended testes, cryptorchidism is seen in 1 to 3% of full-term male infants and up to 30% of premature infants (1,2). Previous studies have shown a strong association between cryptorchidism and decreased fertility, inguinal hernias, and an increased risk of testicular cancer (5-7). The treatment of cryptorchidism consists of an orchiopexy if spontaneous testicular descent has not occurred by 6 months of age (3).

The new AUA clinical guidelines for the evaluation and treatment of cryptorchidism came out in 2014; they state that primary care providers should palpate the testes for quality and position at each well-child visit (3). Since the probability of spontaneous descent is low after 6 months, if a child has persistent cryptorchidism or newly diagnosed cryptorchidism after 6 months, then he should be referred to a pediatric urologist for evaluation and treatment. Recent studies show that a delay in treatment is associated with a testicular histology consistent with impaired fertility (8). It has also been noted that performing an orchiopexy at 9 months rather than at 3 years confers a significant fertility advantage (9). Castillo et al reviewed their patients with intra-abdominal testis and found that patients undergoing a laparoscopic orchiopexy before 2 years of age had significantly better surgical outcomes (10). We believe that early (6 month of age) surgical intervention leads to an easier operation with improved outcomes.

We found that the median referral age was 24 months, significantly beyond the recommended 6 months of age. Other studies have also noted this delay. One study found that the referred patients had a median age of 43.3 months when they underwent surgery (11), while another reported that these patients had a median age of 42.6 months (12). The cause of this delay was not examined, and many factors are likely involved, including the ability to access primary care, access to and delay of specialized care, and health insurance status (13).

In addition, the AUA guidelines state that primary care providers should not perform an ultrasound (or any other imaging modality) in the evaluation of boys with cryptorchidism prior to their referral appointments due to the fact that these studies rarely assist in the decision-making process (3). The

EAU guidelines similarly state that a physical exam performed by the pediatric urologist is sufficient in and of itself for clinical decision-making. Ultrasound is an operator-dependent study that can yield inconclusive findings, especially in patients with non-palpable testes. Our study revealed that testicular ultrasound had poor sensitivity and specificity when used in the evaluation of cryptorchidism. Similar to what we found in our study, Kanemoto et al determined that ultrasound had a sensitivity of 45% and a specificity of 78%, when used in the evaluation of cryptorchidism (14). A recent meta-analysis published in Pediatrics concluded that ultrasound does not reliably localize non-palpable testes and that abdominal–scrotal ultrasound is unnecessary in the preoperative evaluation of boys with non-palpable testes, as it does not affect surgical management (15). Thus, it can be safely stated that it is not a reliable modality for use as a diagnostic criterion for undescended testes.

Despite its lack of usefulness, this radiological study continues to be included in the diagnostic workups of children newly identified with cryptorchidism. In 2011, a national survey of practicing pediatricians revealed that 34% of those who participated either always or usually ordered imaging studies, mainly ultrasound (16). A testicular ultrasound has a cost ranging anywhere from \$150 to \$400, which may increase to up to \$2000 if abdominal imaging is also included. In today's fragile economic landscape, it is of paramount importance to take cost-effectiveness into account when deciding on a diagnostic approach and treatment plan.

Limitations of our study are that it is based on a single surgeon's experience, which may lead to referral bias. Furthermore, our testicular ultrasound database included only patients with documented cases of cryptorchidism. Even with these limitations, we feel that our data portray the current method of diagnosing and managing cryptorchidism in Puerto Rico.

Educating our pediatricians on the importance of early referral to a pediatric urologist and eliminating the use of a testicular ultrasound will improve our management of our patients with cryptorchidism. In order to diminish the economic burden on Puerto Rico's already overloaded public health system, healthcare providers must be made to understand that testicular ultrasound has no place in the diagnosis of cryptorchidism. Designing and then providing a series of educational programs on cryptorchidism is highly recommended to achieve these goals.

Conclusion

Our data reveal that, despite its lack of usefulness, radiologic imaging continues to be included in the diagnostic workups of children with cryptorchidism in Puerto Rico. In addition, there is a significant delay in treatment with surgical interventions compared to what is recommended in national guidelines. It is important to continue educating our referring physicians on the new AUA guidelines in order to create awareness and encourage a proper diagnostic and treatment approach for cryptorchidism.

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