Clinical Study
Role of Ultrasonography in the Preoperative Assessment of Impalpable Testes: A Single Center Experience

Tariq O. Abbas,1 Noora Al-Shahwani,1 Ahmed Hayati,2 Abdul Hady Samaha,1 Ibrahim E. Bassiouny,1 and Mansour Ali1

1 Pediatric Surgery Department, Hamad General Hospital, Doha 3050, Qatar
2 Urology Department, Hamad General Hospital, Doha 3050, Qatar

Correspondence should be addressed to Tariq O. Abbas, tariq2c@hotmail.com

Received 2 December 2011; Accepted 12 January 2012

1. Introduction

About 1-2% of boys at age 1 year have an undescended testis (UDT); this disorder is unilateral in about 90% of cases and bilateral in about 10% [1–3]. Almost one-fifth of undescended testes are nonpalpable [4]. Approximately 50% of nonpalpable testes are abdominal, with 45% being atrophic secondary to in utero spermatic cord torsion, and 5% being in the inguinal canal [5–7].

Among the radiologic methods used to try to “localize” the nonpalpable testis preoperatively are retrograde venography, computerized tomography (CT), magnetic resonance imaging (MRI), and sonography [8–12]. Abdominoscrotal sonography appears promising for the evaluation of impalpable testes, as it is noninvasive, with no radiation risk, and does not require sedation or general anesthesia. We describe our experience with ultrasonography in the preoperative diagnosis of impalpable testes.

2. Methods

We retrospectively reviewed the medical records of all patients less than 14 years who underwent abdominoscrotal ultrasonography for impalpable undescended testes (IUDT) between 2006 and 2010 at our institution. Data reviewed included patient age at surgery, ultrasound results, and intraoperative laparoscopic findings. The results of sonography were compared with those of laparoscopy.

3. Results

We identified a total of 22 patients with 26 impalpable testes, including 4 patients with bilateral impalpable testes, who underwent ultrasonography during the study period. Average patient age at the time of laparoscopy was 31 months. Ultrasonography was successful in localizing 8 of 26 (31%) testes (Table 1).

Only 6 of 26 (23%) testes explored by laparoscopy were identified by sonography, with five of the detected testes localized at the inguinal ring on laparoscopy. In contrast, 7 of the 18 (38.9%) testes not seen on ultrasonography were at the internal ring, whereas two testes identified by ultrasonography were absent during surgical exploration.
4. Discussion

Cryptorchidism is one of the most common genitourinary disorders in young boys. Although the management of boys with palpable testes has been standardized, there are no formal guidelines for the management of boys with nonpalpable testes [13].

Orchiopexy is necessary, whether or not ultrasonography localizes a testis. If ultrasonography fails to demonstrate a viable testis, surgical exploration is still necessary, because neither CT nor MRI has been shown to be reliable in diagnosing a vanishing testis. Consequently, routine preoperative imaging is generally unnecessary, although obese boys may require imaging, since physical examination for an undescended testis can be difficult [14]. Nevertheless, a physical examination, even for obese children, is the most important aspect of presurgical assessment of a boy with an undescended testis [15].

Laparoscopy is currently the most reliable diagnostic modality used in the management of impalpable testes. This method clearly shows the anatomy and provides visual information upon which a definitive decision can be based [16].

It was found that sonography is unnecessary in boys with a nonpalpable testis, because it rarely, if ever, localizes a true nonpalpable testis, and it does not alter the surgical approach in these patients [14]. Ultrasound does not reliably localize a nonpalpable testis and does not rule out an intra-abdominal testis. Eliminating the use of ultrasound will not change the management of boys with nonpalpable cryptorchidism, but it will decrease health care expenditures [17]. In our hands, ultrasonography identified only 6 of 26 (23%) testes, a percentage lower than observed previously [14, 18].

Brody [19] proposed a “top-5 list” in which he called for all medical specialties to identify and recommend against heavily used and expensive diagnostic tests that offer little benefit to patients. We believe that the use of ultrasound to evaluate cryptorchidism meets these criteria [15].

References

[1] D. D. Sweeney, M. C. Smaldone, and S. G. Docimo, "Minimally invasive surgery for urologic disease in children," Nature Clinical Practice Urology, vol. 4, no. 1, pp. 26–38, 2007.
[2] A. J. Swerdlow, C. D. Higgins, and M. C. Pike, “Risk of testicular cancer in cohort of boys with cryptorchidism,” British Medical Journal, vol. 314, no. 7093, pp. 1507–1511, 1997.
[3] F. Hadzismilovic, B. Herzog, and J. S. Barthold, “Treatment with a luteinizing hormone-releasing hormone analogue after successful orchiopexy markedly improves the chance of fertility later in life,” Journal of Urology, vol. 158, no. 3, pp. 1193–1195, 1997.
[4] C. Esposito and V. Garipoli, “The value of 2-step laparoscopic Fowler-Stephens orchiopexy for intra-abdominal testes,” Journal of Urology, vol. 158, no. 5, pp. 1952–1955, 1997.
[5] J. S. Elder, “Laparoscopy for impalpable testes: significance of the patent processus vaginalis,” Journal of Urology, vol. 152, no. 2, pp. 776–778, 1994.
[6] D. A. Diamond and A. A. Caldamone, “The value of laparoscopy for 106 impalpable testes relative to clinical presentation,” Journal of Urology, vol. 148, no. 2, pp. 632–634, 1992.
[7] R. G. Moore, C. A. Peters, S. B. Bauer, J. Mandell, and A. B. Retik, “Laparoscopic evaluation of the nonpalpable testes: a prospective assessment of accuracy,” Journal of Urology, vol. 151, no. 3, pp. 728–731, 1994.
[8] R. M. Weiss, M. G. Glickman, and B. Lytton, “Clinical implications of gonadal venography in the management of the nonpalpable undescended testes,” Journal of Urology, vol. 121, no. 6, pp. 745–749, 1979.
[9] M. K. Wolverson, B. Jagannadharao, M. Sundaram, M. A. Riaz, W. J. Nalesnik, and E. Hottiuin, “CT in localization of impalpable testes,” American Journal of Roentgenology, vol. 134, pp. 725–729, 1980.
[10] P. J. Fritzsche, H. Hricak, B. A. Kogan, M. L. Winklow, and E. A. Tanagho, “Undescended testis: value of MR imaging,” Radiology, vol. 164, no. 1, pp. 169–173, 1987.
[11] R. M. Weiss, A. R. Carter, and A. T. Rosenfield, “High resolution real-time ultrasonography in the localization of the undescended testis,” Journal of Urology, vol. 135, no. 5, pp. 936–938, 1986.
[12] C. M. Kullendorff, E. Hederstrom, and L. Forsberg, “Preoperative ultrasonography of the undescended testis,” Scandinavian Journal of Urology and Nephrology, vol. 19, no. 1, pp. 13–15, 1985.
[13] C. Esposito, A. A. Caldamone, A. Settimi, and A. El-Ghoneimi, “Management of boys with nonpalpable undescended testes,” Nature Clinical Practice Urology, vol. 5, no. 5, pp. 252–260, 2008.
[14] J. S. Elder, “Ultrasoundography is unnecessary in evaluating boys with a nonpalpable testis,” Pediatrics, vol. 110, no. 4, pp. 748–751, 2002.
[15] B. N. Breyer, M. DiSandro, L. S. Baskin, and M. H. Hsieh, “Obesity does not decrease the accuracy of testicular examination in anesthetized boys with cryptorchidism,” Journal of Urology, vol. 181, no. 2, pp. 830–834, 2009.
[16] S. Y. Tennenbaum, S. E. Lerner, and I. M. McAleer, “Preoperative laparoscopic localization of the non palpable testes;
a critical analysis of a 10-year experience,” *Journal of Urology*, vol. 164, pp. 154–155, 2000.

[17] G. E. Tasian and H. L. Copp, “Diagnostic performance of ultrasound in nonpalpable cryptorchidism: a systematic review and meta-analysis,” *Pediatrics*, vol. 127, no. 1, pp. 119–128, 2011.

[18] R. L. Hrebinko and M. F. Bellinger, “The limited role of imaging techniques in managing children with undescended testes,” *Journal of Urology*, vol. 150, no. 2, pp. 458–460, 1993.

[19] H. Brody, “Medicine’s ethical responsibility for health care reform—the top five list,” *The New England Journal of Medicine*, vol. 362, no. 4, pp. 283–285, 2010.