

Comparison of Ultrasonographic and Operative Findings in Undescended Testes

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ABSTRACT

INTRODUCTION: A patient with a nonpalpable testis (NPT) is a diagnostic challenge. Use of ultrasonography (US) for the diagnosis of NPT is controversial. The purpose of the present study was to compare US with surgical findings.

METHODS: Between January 2000 and January 2007, 65 patients with a diagnosis of undescended testis (UDT) were evaluated. The 65 patients had 77 UDT. The patients had a physical examination that was followed by US and then surgery. All patients had a second physical examination in the operating room while under anesthesia.

RESULTS: US localized 57 (74%) nonpalpable testes. Of these, 50 were in the inguinal region and 7 were in the abdomen. The sensitivity of US was 100% for the inguinal canal and 39% for intraabdominal viable testes.

CONCLUSION: All patients with presumed nonpalpable, undescended testes should be referred to a urologist for physical examination before receiving US. The authors recommend US as a first instrumental test for all patients with NPT. When US is negative, they advise laparoscopy.

KEYWORDS: Undescended testes; Ultrasonography; Cryptorchidism; Operative Finding

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INTRODUCTION

Undescended testes (UDT) or cryptorchidism is a common anomaly in children. Cryptorchidism is a condition in which the testis is not positioned in the scrotum at 36 weeks of gestation. It occurs in 0.8-2% of full term and 18-30% of prematurely born boys. Sixty to 70% of undescended testes are unilateral and 30% are bilateral. Twenty percent of the undescended testes are nonpalpable on physical examination [1]. Of these, approximately 50% are abdominal, 45% are atrophic secondary to spermatic cord torsion in intrauterine life, and 5% are in the inguinal canal [1,2].

The atrophic testes are known as vanishing testes. Usually they are in the scrotum; a few are in the inguinal canal. The diagnosis of UDT can be done by clinical examination, through repeated and meticulous palpation of the inguinal canal and scrotum [3]. An undescended testis has impaired spermatogenesis and is prone to malignancy changes. The risk is greater when the testis lies higher, especially when it is intraabdominal [4]. Some reports showed that spermatogenesis decreased in the undescended testis; the longer surgery is delayed the higher the risk [5,6].

Currently, there is controversy as to what steps should be taken when clinical examination fails to identify a testis. Further exploration might be done using laparoscopy or a less invasive procedure such as ultrasonography (US), CT, MRI or venography [2,7,8,9]. US is the preferred choice for children because it avoids x-ray exposure, is noninvasive, inexpensive, and widely available. Correct diagnosis is essential because there is worldwide consensus for early treatment of undescended testes to decrease the risk of malignancy and infertility problems [5, 10].

The purpose of the present investigation was to compare the results of US and surgery, to determine if US was effective in diagnosing undescended testes. It was hypothesized that if US failed to localize NPT undescended testes, laparoscopy would be the next choice.

METHODS

Between January 2000 and January 2007, 65 patients with the diagnosis of UDT were referred or presented to the Department of Urology in Alkwait University Hospital-Sana'a, Yemen. Their ages ranged from 2 to 35 years (median = 16 years). There was no genetic syndrome found in any of the patients.

A clinical examination was done by a urologist. This included a thorough local examination of the inguinal, genital, and suprapubic areas, the perineum, and all possible sites for ectopic testes. The findings were recorded.

Next, ultrasonography examination was done by an experienced radiologist, using a linear array transducer set at 7.5 MHz. In unilateral UDT, the US was done on the normal descended testis followed by the undescended testis. The examined region included the scrotum, inguinal canal, pelvis, and abdomen, following the normal pathway through which the testis descends into the scrotal sac. The possible locations of ectopic testes were examined if no testis was found in the normal pathway. The site and size of the testes were recorded.

All patients underwent surgical exploration using laparoscopy, except for those with intraabdominal testes. For viable testes, most of the patients underwent orchiopexy in one or two stages (subdartos pouch). For atrophic or vanishing testes, orchidectomy was performed. Following surgery, patients received a second physical examination while they were still under anesthesia.

RESULTS

The participant group of 65 patients had 77 nonpalpable undescended testes. The UDT was unilateral in 53 patients (right 22; left 31) and bilateral in 12 patients.

US localized 57 UDT (74%); 50 were located in the inguinal region and 7 were in the intraabdominal area. Twenty cases were not located by ultrasound. Clinical examination was repeated after ultrasound, and 30% of previously nonpalpable testes were located by using the US results.

All cases underwent surgical exploration and they were managed by either one or two-stage orchiopexy or orchidectomy. Comparing the ultrasound results with operative findings, US was able to predict 100% of the 7 intraabdominal testes. Of the 20 cases that were not detected by US, 11 testes were found in the lower abdomen (retroperitoneal) or close to the internal inguinal ring. A majority of these patients underwent one-stage orchiopexy. For the remaining 9 undescended testes that were not seen on US, 5 were vanishing testes diagnosed by laparoscopy and 4 were defined by operation as atrophic intraabdominal (for which orchidectomy was undertaken).

US failed to localize 20 NPT; however, the results of surgery showed that 11 of the 20 appeared to be viable located intraabdominally and 9 were atrophic and vanishing testes located in the abdomen. In summary, 68 (88%) of the 77 UDT were defined as viable at operation (orchiopexy was performed); 57 of the 68 (84%) were located by US. Nearly all viable inguinal testes were correctly located by US; 7 out of 18 (38.9%) viable abdominal testes that were found surgically were seen in the ultrasound.

DISCUSSION

Cryptorchidism literally means hidden or obscure testis. It is synonymous with incomplete testicular descent. The condition may be unilateral or bilateral. The term encompasses palpable as well as ectopic testes and it is one of the most common surgical disorders in childhood. The definitive treatment of true undescended testis is surgical placement into the scrotum. The majority of UDT are palpable, but as many as a third of these testes are retractile when examined [14].

Twenty percent of all UDT are nonpalpable and might be located anywhere between the upper scrotum and abdomen, or may be absent. Accurate preoperative localization of the NPT is a challenge. Many imaging techniques have been proposed, such as selective gonadal arteriography and venography. These

procedures are invasive and may require general anaesthesia [16]. CT is unreliable and carries the risk of radiation [7]. Others that are noninvasive and have no risk of irradiation are US and MRI [10,11]. Laparoscopy has high accuracy rate in localizing an intraabdominal testes [15,16], but it carries operative complications including peritoneal adhesion [13,17].

Ultrasonography and MRI have nearly identical accuracy rates (US 84%; MRI 85%) for diagnosing NPTD [11]. MRI is more sensitive than US in localizing high testes, especially abdominal testes. However, MRI has some disadvantages such as long scanning time, motion artifacts during the examination, the need for sedation, and high cost. The advantages of US include convenience, noninvasiveness, lack of radiation exposure, low cost, and availability. It is useful for detecting canalicular testis, but not for detecting abdominal and atrophic testes [11].

CONCLUSION

In the present study, the sensitivity of ultrasonography for identifying the viable NPT was 57 out of 68 (84%). There was a 30% increase in clinical diagnosis after the US. These results are comparable with the results of other studies. The authors recommend referring patients with NPT to a urologist or pediatric surgeon with extensive experience in genital examination of small children. The authors recommend the use of US as the first investigation for all patients with NPT, and the use of laparoscopy when US is negative. They also recommend inguinal exploration and orchiopexy for all cases demonstrated by US.

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