



ORIGINAL ARTICLE

Role of laparoscopy and ultrasound in the management of “impalpable testis” in children



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Received 10 July 2013; accepted 14 January 2014

Available online 22 March 2014

KEYWORDS

undescended testis;
impalpable testis;
ultrasound;
laparoscopy

Summary *Background:* Undescended testes is one of the most common congenital abnormalities in boys. In cases of impalpable testes, ultrasound is often used to find the testis, which frequently provides false-negative results. Recently, laparoscopy has become popular in the management of impalpable testes.

Methods: Retrospective study of all children with impalpable testes presenting for laparoscopy between August 2007 and July 2011 who had undergone ultrasound examinations without localizing the testes was conducted and the role of laparoscopy in diagnosing impalpable testes was evaluated.

Results: Twenty-three patients presented with impalpable testes for laparoscopy. All patients underwent ultrasound examinations in which the testes could not be identified. Of the 23 patients, Five patients were found to have palpable testes in the superficial inguinal pouch under anesthesia and proceeded to conventional open exploration during which the testes were brought into the scrotum. Eighteen patients were found to have impalpable testes in an evaluation under anesthesia (EUA) and proceeded to laparoscopy. Twelve patients were found to have intra-abdominal testes and underwent laparoscopic-assisted orchidopexy. Three patients

Conflicts of interest: The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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<http://dx.doi.org/10.1016/j.asjsur.2014.01.013>

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underwent a two-stage Fowler-Stephens procedure, and two patients with “vanishing” testes with the vas and atrophic vessels entering a closed internal ring proceeded to open exploration and orchidectomy for atrophic testes. In addition, a teenager with atrophic testes underwent laparoscopic orchidectomy.

Conclusions: Laparoscopy is superior to ultrasound in the management of impalpable testes when high-resolution ultrasound is not available during the diagnostic process, with respect to both the sensitivity of localizing the testis and being more time and cost effective.

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1. Introduction

Undescended testes in boys is a very common congenital abnormality in which one or both testes do not reach the bottom of the scrotum prior to birth. The incidence of the condition is 3–5% among all boys at birth, and decreases to 0.8–1% after 6 months of age.^{1–12} The classification of undescended testes includes suprascrotal, intracanalicular, intra-abdominal, and ectopic types,^{6,13} whereas the classification of impalpable testes includes intra-abdominal, intracanalicular, vanishing testis, and agenesis testis types.¹⁴ The diagnostic tools used to detect undescended testes include physical examinations, radiologic examinations, hormonal examinations, and laparoscopic examinations.^{1,4,10,15–18} When the testes cannot be detected by physical examination, ultrasound is the most favored tool among the radiologic examinations because it is the least invasive procedure and does not scare children, whereas other radiologic examinations require anesthetic procedures and the associated risk of radiation. Ultrasound is also a fast and simple procedure to perform. Despite its advantages, ultrasound provides the lowest sensitivity results in localizing impalpable testes,^{2,4,6,8,18–20} unless high-resolution ultrasound is used, which achieves similar outcomes as computed tomography scans.^{1,6} However, high-resolution ultrasound is not widely available in most centers in developing countries. The lack of equipment sometimes leads to misdiagnosis and misleads the parents into not taking further action and assuming that the testes had not formed.

Males with undescended testes have a lower sperm count, poorer quality sperm, and lower fertility rate, compared to males whose testicles descend normally; the rate of subfertility increases with bilateral involvement and increasing age at the time of orchidopexy.^{1,4} Based on the results of testicular biopsies performed at the time of orchidopexy, the germ cell density decreases over time, beginning as early as 1 year of age.⁴ Fertility is directly related to the age at orchidopexy with a success rate as high as 87.5% if the surgery is performed before 2 years of age and as low as 14% if the surgery is performed at 13 years of age or older; however, these figures may be influenced by the distribution of unilateral and bilateral cases.²

Undescended testes are not a life-threatening disease. Therefore, most parents try to avoid any invasive procedures they believe are unnecessary. However, the long-term risk of testicular cancer has been well documented in males with a history of undescended testes, particularly if surgical correction is performed after 1 year of age.^{1,2,4,6–8,11,12}

Hence, making a correct diagnosis is essential to ensure that the patient receives proper treatment at the appropriate time to reduce the risk of testicular cancer.

Laparoscopy has become widely used to diagnose impalpable testes since 1976 when Cortesi et al¹⁵ initially described it. Using laparoscopy, the testes can be clearly identified and localized, and treatment can be administered immediately after making a diagnosis. Therefore, the risk of misdiagnosing agenesis testis in impalpable testes is reduced, which then reduces the risk of testicular cancer over the long term.

2. Patients and methods

The diagnosis of impalpable testis in patients who were referred to Universiti Kebangsaan Malaysia (UKM) Hospital Pediatric Surgery Outpatient Clinic in Kuala Lumpur, Malaysia between August 2007 and July 2011 was confirmed by physical examinations (Fig. 1). Based on the UKM Clinical Pathway Guidelines, the patients were eligible for an evaluation under anesthesia and proceeded to open orchidopexy if the testes were palpable, or they underwent diagnostic laparoscopy and then proceeded to the appropriate surgery. If intra-abdominal testes were detected, the testes were evaluated with respect to whether they could be brought down into the scrotum without tension by bringing the testis to the contralateral side. If there was no tension, the procedure was continued with laparoscopic-assisted orchidopexy. If there was tension, the procedure was continued with the two-stage Fowler–Stephens technique.¹ If remnants of the testes were present or if the vas deferens and vessels entered the inguinal canal, the procedure was continued with exploration and orchidectomy of the atrophic testis. If the testes were found to be atrophic intra-abdominally, a laparoscopic orchidectomy was performed.

3. Results

Prior to being referred to the UKM Hospital Pediatric Surgery Outpatient Department, 23 patients with impalpable testes presented for laparoscopy after having undergone ultrasound. No testes were identified on ultrasound examinations. Five patients had palpable testes in the superficial inguinal pouch under anesthesia, and proceeded to conventional open exploration during which the testes were brought into the scrotum without tension. Eighteen (18/23)

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