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## Laparoscopic single-stage Fowler-Stephens orchidopexy in a case with bilateral undescended testes

Soner Coban<sup>1</sup>, Ali Riza Turkoglu<sup>1</sup>, Muhammet Guzelsoy<sup>1</sup>, Murat Ozturk<sup>1</sup>, Osman Akyuz<sup>2</sup>, Efe Onen<sup>1</sup>, Kadir Acibucu<sup>1</sup>, Salim Zengin<sup>1</sup>

<sup>1</sup>Department of Urology, Yuksek Ihtisas Research and Educational Hospital, Bursa, Turkey

<sup>2</sup>Department of Urology, Medicine Hospital, Biruni University, Istanbul, Turkey

### ABSTRACT

Nowadays laparoscopy has been used for diagnostic purposes; also it has become more preferable to place intra-abdominal testes to the scrotum than to open surgical method. In the management of non-palpable testes, laparoscopy is a standard and widely accepted technique. The high success rates in diagnosis and treatment, as well as cosmetic results and short hospitalization periods provided by laparoscopy are the other advantages of this technique. In this case report, we shared a case of non-palpable testes treated by laparoscopic method.

**Key Words:** Laparoscopy; non-palpable testis; orchiopexy; hernia repair.

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*Corresponding Author: Dr. Soner Coban.*

*Department of Urology, Yuksek Ihtisas Research and Educational Hospital, Bursa, Turkey.*

*E mail: [sonercoban75@my.net.com](mailto:sonercoban75@my.net.com)*

*ORCID ID: <https://orcid.org/0000-0002-4687-8754>*

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### Introduction

Non-palpable testes (NPT) constitutes 20% of all undescended testis cases and these may be due to vanishing, agenesis, intra-abdominal localization, or varying degrees of dysplasia or atrophy. In the case of intra-abdominal testis, the testis can be located anywhere between the lower pole and the internal ring, while the most common site is just above the internal ring. Physical examination and radiological imaging

methods are often insufficient to prove the presence of testis [1-3]. Since Cortesi et al. defined diagnostic laparoscopy in 1976 for non-palpable testis, nowadays this practice has been accepted as the most reliable method in diagnosis [1].

There are many advantages of laparoscopy, such as decreased postoperative pain, better cosmetic appearance and decrease in hospitalization time compared to open surgery [2]. Laparoscopy not only used for diagnostic purposes, but also it has become more preferable to be place the intra-abdominal testes to the scrotum than to open surgical method [3]. In this report, we aim to present a case with bilateral nonpalpable testes who underwent laparoscopic orchidopexy, and to

emphasize the importance of laparoscopy in diagnosis and treatment in NPT.

### Case report

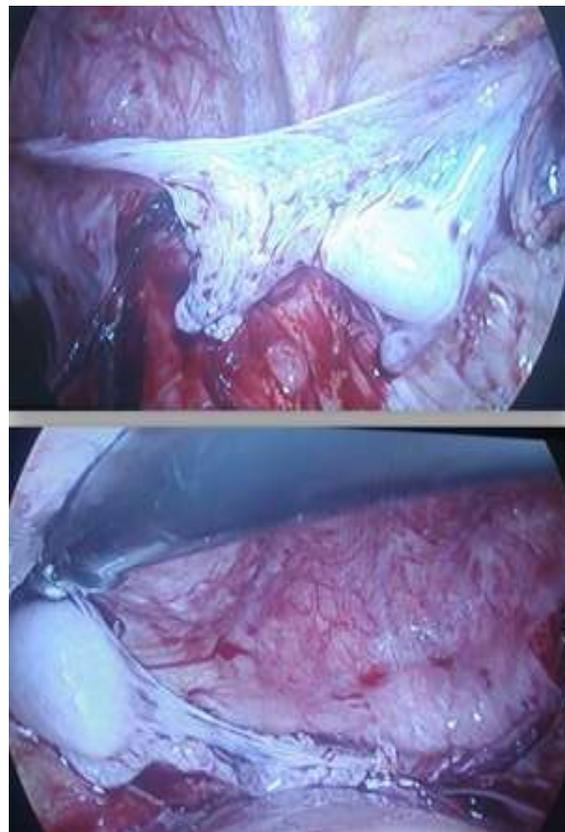
A 4-year-old patient was admitted to the outpatient clinic due to the bilateral empty scrotum. Physical examination revealed a normal male external genitalia, with the normally developed scrotum. Because of testes cannot be palpated in the scrotum, the inguinal canal, the femoral region and the perineum, we considered a diagnostic laparoscopy for evaluation for the NPT.

After obtaining parental consent for whole of procedure which consist diagnosis and treatment in the same session, the patient prepared for operation. Firstly, a physical examination under general anesthesia was performed prior to the surgical procedure in order to plane the surgical approach for patient with NPT. Then the child was supine and crossed his legs, placing the non-dominant hand just above the symphysis, we inhibited the cremasteric reflex. We made the milking movement to move the testis towards the scrotum. No testis was detected in the inguino-scrotal region.



**Fig. 1.** Trocar placement for laparoscopic procedure.

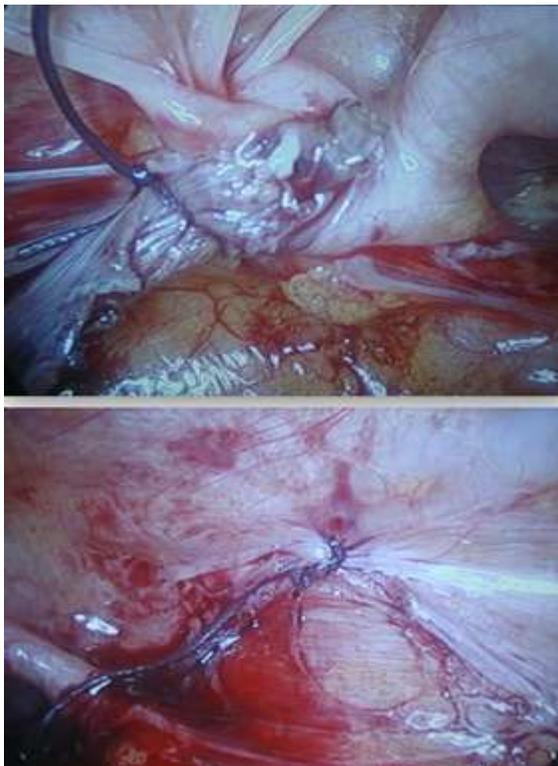
The patient was positioned in supine position and a bladder catheter was placed. After introducing a Veress needle into the intra-abdominal cavity through an infraumbilical stab incision, pneumoperitoneum with a pressure of 10 mm Hg was created by CO<sub>2</sub> insufflation. Then 10 mm optical trocar was entered into the abdomen for 0° telescope. Two 5 mm trocars were additionally inserted into the right and left of the umbilicus for working instruments [Fig. 1]. Both testes were detected in the inferiority of the internal ring in the abdomen (peeping). We realized the testes have difficulty reached to the scrotum via open inguinal canal, and decided the dividing of the testicular vessels for a single stage of Fowler-Stephens orchiopexy [Fig. 2].



**Fig. 2.** Dissection of the testes and the cord.

The testes were carefully mobilized from peritoneum as preserving vas deferens and vas

arteries. Testes were pulled down to establish a new route by the retrograde introduced 5 mm trocars from the scrotum at the medial end of the inguinal canal owing to inadequate length of cord. The testes were held with the grasper without any strain on the scrotum. Then the scrotum was closed. Bilateral hernia repair was performed by suturing internal ring due to patency [Fig. 3].



**Fig. 3.** Laparoscopic ring closure: completion of the purse string suture and occlusion of the internal ring.

The patient was discharged on the third postoperative day. On physical examination performed on postoperative 10 days control, it was observed that the testes were viable and located at the scrotum [Fig. 4].

### Discussion

Testicular descent occurs as a result of two phases, transabdominal and inguinoscrotal landing, which develop as a result of different



**Fig. 4.** The patient's postoperative appearance.

anatomical and hormonal mechanisms which are not fully explained [4]. The gubernaculum, the most critical structure during descent, shows a 'swelling reaction' in the first phase, the transabdominal phase, and is between the 10th and the 15th weeks of intra-uterine development. In this phase, the testes move from the lower pole of the kidneys to the inguinal canal entrance in the abdomen and in the inguinoscrotal phase the second phase is actively migrated out of the abdominal wall and migrates to the scrotum together with the testis and the testes pass through the inguinal canal to the scrotum and the descent is completed at the end of the 35th week. In the first phase, insulin-like hormone 3 is the most important regulator and with the effect of testosterone, the cranial suspension ligament disappears. The inguinoscrotal phase is controlled by androgens either directly affecting on gubernaculum or enabling secretion of calcitonin gene-dependent peptide from the sensory branches of the genitofemoral nerve [5].

The main goal of the orchidopexy in undescended testes is to prevent testicular degeneration and infertility caused by the high temperature in the upper position of testis according to the scrotum, to prevent the possibility of malignancy, to prevent the formation of inguinal hernia and testicular torsion and trauma, and to prevent the psychological distress of the empty scrotum on the family and the child [6]. Histological changes in undescended testis are characterized by a decrease in Leydig cell number, degeneration of Sertoli cells, delayed gonocyte deterioration, delayed appearance of spermatogenesis, non-development of primary spermatocytes and decreased total germ cell counts, and it is observed between 1-2 years of age [7]. Therefore, treatment should be performed at the earliest 6th month at the latest at 18 months, preferably at around 1 year [8]. In 20% of all undescended testis cases, the testes are nonpalpated on physical examination. Although this condition may be due to obesity, retractile, ascending, and ectopic or canalicular located testis, 40% of the NPT are intra-abdominal and 28% are intracanalicular and 32% have no testes [9]. Laparoscopy has become the gold standard for both diagnostic and treatment decisions in the management of NPT patients. Many different classification described in the definition of laparoscopic findings [10]. These classifications are made according to the presence of testis, atrophy or absence of testis, the spermatic vessels entering the internal inguinal ring and the blind termination of vas deferens and intersex anomalies. Fowler-Stephens 2-stage repair technique is used if the cord is short or far from the inner inguinal ring of the testes (over 2-4 cm) [11]. At the first stage, the testicular veins are clipped. This waiting period is necessary for

maximizing the Vasal circulation with the collateral vascularization. The second stage is achieved after a period of at least 6 months. In our case, although testicular veins were short, cord was adequate length. For this reason, we decided to perform single-stage Fowler Stephens. We also noticed that the testicles have difficulty reaching the scrotum through the open inguinal canal. Therefore, we lowered the testis from the medial of the inferior epigastric vessels and lateral of the obliterated umbilical artery to a scrotum from a new hiatus (laparoscopic Prentiss maneuver). In a recent review, single and two-stage Fowler-Stephens techniques were compared and it was reported that both methods were successful [12].

The use of laparoscopy in non-palpable testis was primarily diagnostic. While the accuracy of current patterning methods is around 85%, the accuracy of diagnostic accuracy in laparoscopy is 97-100% [13]. Laparoscopy is indicated for single or double sided non-palpable testis. The only method for the differential diagnosis of non-palpable testis is diagnostic laparoscopy. The level of evidence 1b recommendation in the EAU guideline is A. Fertility is one of the main goals in the treatment of undescended testes. In the past 30 years, there has been strong evidence that undescended testis leads to damage to germ cell development during postnatal period [14]. One of the main objectives of the treatment of undescended testis is to prevent cancer development. Walsh et al. In a meta-analysis published by the children, the risk of developing cancer was found to be 5.8 times higher in the prepubertal period than in children without orchiopexy [15].

In conclusion, in the management of NPT cases, laparoscopy is a standard and widely accepted technique. The high success rates in diagnosis and treatment, as well as cosmetic

results and short hospitalization periods provided by laparoscopy are the other advantages of this technique.

### Compliance with ethical statements

*Conflicts of Interest:* None.

*Financial disclosure:* None.

*Consent:* All photos were taken with parental consent.

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