

Research Article

Ante-grade Laparoscopic Testicular Vessels Dissection in Proximal Inguinal Undescended Testis: A Novel Approach

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Abstract

Purpose: To present a novel approach to deal with proximal inguinal undescended testis (UDT) to improve the mobilization of testicular vessels in these cases laparoscopically in order to improve the outcomes.

Patients & Methods: Seventeen testes of proximal inguinal UDT as diagnosed by clinical examination and ultrasound scan were treated along the last 7 years. All cases were subjected to laparoscopic ante-grade dissection in a medial and lateral manner of inguinal canal including dissection of testicular vessels with distal division of gubernaculum after dissection if needed as described by Prof Sherif Shehata. The testis is brought to abdomen than passed to the scrotum through the canal under laparoscopic guidance. Associated hernia repaired accordingly laparoscopically. Operative findings and post-operative results and complications were assessed. The patients were followed for a period that ranged between 6 and 24 months with mean of 18.5 ± 8 months. Post-operative duplex is done in 3 cases at 3 months post operatively

Results: We have 16 boys with UDT; 8 right and 7 left and one bilateral case. Operative age ranged between 8 months and 36 months. Six cases of associated hernia were repaired; 4 by purse string suture and 2 with herniotomy. Operative time ranged between 45 and 90 min without conversion. Mild scrotal edema was reported in 4 cases and port site infection in one case where all were treated conservatively. No case of testicular atrophy in the 3 cases subjected to post-operative ultrasound.

Conclusion: Laparoscopic ante-grade dissection of testicular vessels is feasible and safe new approach in unilateral proximal inguinal UDT. It provides enough length of testicular vessels that provides better outcome along follow up. Larger studies and long-term follow up are needed to support this initial experience.

INTRODUCTION

The first comprehensive description of the surgical anatomy of testicular maldescent was that of Sir Denis Browne (1938), and most of the views expressed in his classic article concerning the types of undescended testicles, their clinical and operative features, and their prognostic implications are now universally accepted [1]. Diagnosis of undescended testis (UDT) specially proximal inguinal location rely upon clinical examination, abdomino-pelvic ultrasonography (US), computerized tomographic scanning (CT) of the abdomen and pelvis, magnetic resonance imaging (MRI) and diagnostic laparoscopy [2,3]. The testicular position after conventional inguinal orchidopexy for canalicular, "peeping" and redo undescended testes may not be satisfactory despite retroperitoneal dissection [4]. The advantages of the laparoscopic approach include the following; a procedure that clarifies and treats both sides in one session; any associated hernia can be detected during laparoscopy and closed immediately, trocar position is the same for both sides, excellent visualization and magnification of the cord structures

[5]. Esposito and colleagues stated that laparoscopic orchidopexy without division of the spermatic vessels should be the treatment of choice in the management of non-palpable testes, because it does not affect normal testicular vascularization and is minimally invasive [6]. Laparoscopic finding of a vessels and vas passing through the internal ring without testicular atrophy in undescended testis (UDT) remains a challenge for surgeon to complete orchidopexy free of tension [7,8]. In similar location regarding length of testicular vessels (peeping testis), two out of twenty open orchidopexies requires redo surgery reported formerly [9]. This study was proposed to present a novel approach to deal with proximal inguinal UDT to facilitate the laparoscopic mobilization in order to improve the outcomes.

PATIENTS AND METHODS

Sixteen consecutive boys with proximal inguinal UDT presented to the Department of pediatric surgery, Tanta University Hospital, Egypt, over a 7 years period (From January 2009 till December 2016) were included in this study. A detailed informed consent was obtained from each patient's guardian.

Exclusion criteria included distal half inguinal UDT on clinical examination, impalpable testis. No special preoperative measures were required. All patients received GA with endotracheal intubation or laryngeal mask. In all patients, we had adopted the open technique to establish pneumoperitoneum. Intra-abdominal gas pressure ranging from 8 to 12 mmHg has been found to be sufficient for the procedure using 5-mm 30° telescope. All cases were subjected to laparoscopic exploration first where 15 have vessels and vas of good caliber was passing the internal ring including one bilateral case. All cases were subjected to laparoscopic ante-grade dissection in a medial and lateral manner of inguinal canal including dissection of testicular vessels with proximal mobilization of gubernaculum after dissection if needed as seen in Figure (1A-1C). This novel technique is described by the first author; Prof Sherif Shehata [10]. The testis is brought to abdomen than passed to the scrotum through the canal under laparoscopic guidance as seen in Figure (1D-1E). Associated hernia repaired accordingly laparoscopically. Operative findings and post-operative results and complications were assessed. The patients were followed for a period that ranged between 6 and 24 months. Post-operative duplex is done when there is slight decrease in testicular size according to Tanner's scale at 3 months post-operative follow up visit.

RESULTS

We have 16 boys with proximal UDT testis, 15 unilateral; 8 right and 7 left and one bilateral case. Operative age ranged

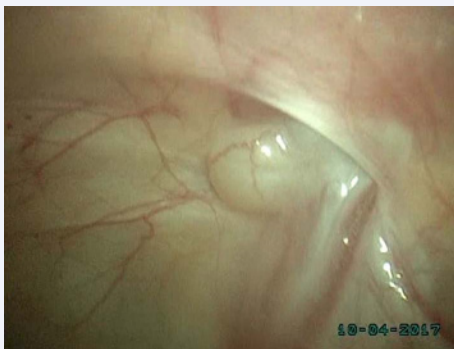


Figure 1a Operative laparoscopic view of Left case of UDT showing vessels and vas pass the internal ring.

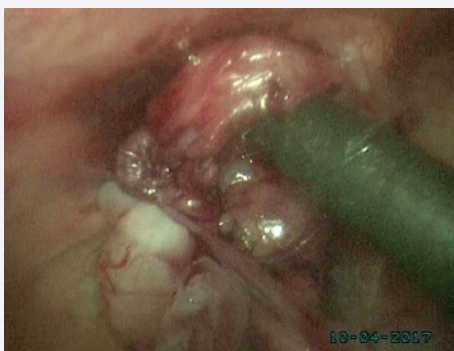


Figure 1b A laparoscopic view of the same case showing elevation of testicular vessels after lateral and medial dissection in ante grade manner towards the canal.

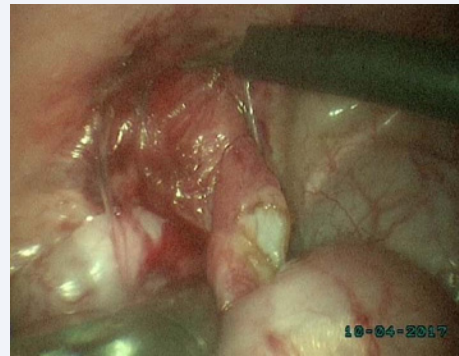


Figure 1c A laparoscopic operative view of the same case showing the complete dissection around the vessels and bringing the testis to abdomen with the start of gubernaculum separation.



Figure 1d A laparoscopic view of the same case showing the complete delivery of Lt proximal UDT.

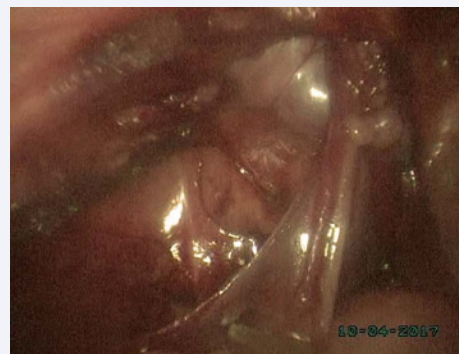


Figure 1e A laparoscopic view of the same case showing the delivery of testis towards the ipsilateral scrotum under laparoscopic guidance.

between 8 months and 36 months. All cases completed laparoscopically without conversion. Two testes were found to be of peeping type and managed in the same way. Operative time ranged between 45 and 90 min. Six cases of associated hernia were repaired; 4 by purse string suture as seen in Figure (2) and 2 with herniotomy. Mild scrotal edema was reported in 4 cases and port site infection in one case where all were treated conservatively. No case of testicular atrophy in the 3 cases subjected to post-operative ultrasound in the follow up period at 3 months post operative visit.



Figure 1f Operative photograph showing the left testis through scrotal wound.

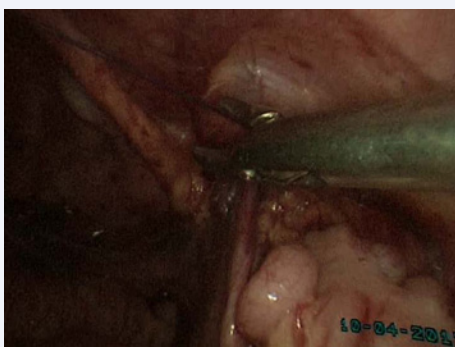


Figure 2 A photograph showing laparoscopic view of Right proximal UDT in the bilateral case during laparoscopic hernia repair by purse string suture.

DISCUSSION

The problem of tension on testicular vessels in cases of proximal inguinal UDT, peeping testes or intraabdominal testis is a major concern reflected on the outcome of orchiopexy in these cases [11]. Trials to find solutions to such cases continue. The laparoscopy changed the management of UDT in a definite way [12]. The problem is more prevalent in impalpable cases but complete dissection of testicular vessels is a key point to prevent later atrophy or ischemia [13]. This is augmented by minimal manipulation of testis [7,9,13]. Improvement of technology of optics and laparoscopic instruments added to the experience gained along decades make the notion the possibility to dissect through the inguinal canal is feasible [5,14]. The idea to dissect the proximal half of the inguinal canal with preservation of vessels and vas by laparoscopy presented in this study is new using the laparoscopic advances and experience. This novel approach gives the best dissection to the whole vessels till origin which is impossible by open way [9]. The principle may be reported earlier in inguinal hernia repair by open techniques but not in UDT [4,15]. We did not encounter any intra operative complications in the 17 testes managed employed the ante grade dissection as the natural route of testis from abdomen to inguinal canal. Selection criteria for the cases in this study are exclusive to proximal canalicular UDT without atrophy is a factor for excellent outcomes since intra-abdominal high testes may not come down in one stage that necessitate another option or session to preserve the testicular vascularity [11,16]. Outcome of this new technique shows no atrophy as any tension exerted on testicular vessels

in the cases managed without late sequel even hidden. Age is not a limit in accordance to guidelines [17], since with smaller instruments we operate at 8 months age. Another advantage is managing associated inguinal hernia in the same session and complete orchiopexy as one stage with single anesthesia exposure is another advantage over staged procedures in well indicated categories of UDT [18]. As reported before, laparoscopic orchiopexy is a natural extension of diagnostic laparoscopy for the intraabdominal testis at the internal ring or that seen peeping from it [18]. Hence, this new ante-grade dissection technique [Shehata's Ante-Grade Approach] provides many advantages in well selected cases with no subsequent atrophy despite that the small number of cases in this study [10]. Larger number of cases is needed to standardize this new technique in proximal inguinal UDT.

CONCLUSION

Laparoscopic ante-grade dissection of testicular vessels is feasible and safe new approach in unilateral proximal inguinal UDT. It provides enough length of testicular vessels that provides better outcome along follow up. Larger studies and long-term follow up are needed to support this initial experience.

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