Original Article

Laparoscopic orchiopexy for the nonpalpable testis: 3 years experience.

Md. Nowshad Ali,[a] S.M. Ahsan Shahid[a],
Mst. Rokeya Khatun,[b] Mostaque Ahmed[a]

[a]Department of pediatric surgery, Rajshahi Medical College, Rajshahi, Bangladesh.
[b]Department of Gynaecology & Obstetrics, Rajshahi Medical College, Rajshahi,Bangladesh.

Correspondence to:
MN Ali
nowshadmd@yahoo.com

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Abstract

Background: We evaluated the safety and efficacy of laparoscopic orchiopexy in management of nonpalpable intra-abdominal testis and studied the outcomes. Here, 3 years experience is being reported. **Methods:** Laparoscopic Orchiopexy was performed on 28 children (32 testicular units) for non-palpable intra-abdominal testis between 2010 and 2012. We retrospectively reviewed the medical records. The mean age was 3.4 years (range, 2.5 -11 years).). Of the 28 patients, 18 (64.3 %) were on the right, 6 (21.4%) were on the left and 4 (14.3%) were bilateral. The mean follow-up period was 14.8 months (range, 3-36 months). Testicular viability and orchiopexed positioning were evaluated within 1 month and beyond 3 months. **Results:** Thirty one testes were descended successfully by laparoscopy. The average operative time was 41.5 ± 3.8 min. Primary laparoscopic orchiopexy done in 26 testes. Three of unilateral and 2 of bilateral testicular units underwent one - stage Fowler-Stephens Orchiopexy. One patient needed laparoscopic orchiectomy. At follow-up (mean 14.8 months), one testis atrophied and needed orchiectomy. Testicular survival rate was 96.8% (30/31) and all of the testes maintained an adequate size. Twenty six (83.9%, 26/31) are in an acceptable scrotal position and 4 testes (12.9%, 4/31) are mid to high in the scrotum without atrophy. There was no recurrent inguinal hernia. **Conclusions:** Laparoscopic orchiopexy is successful for a nonpalpable intra-abdominal testis with a high testicular survival rate. The low incidence of complications and high success rate underscore the feasibility of this procedure.

Key words: Non palpable testis, Laparoscopic Orchiopexy, Children.

INTRODUCTION

Undescended testis (UDT) is one of the common clinical disorders of childhood, occurring in approximately 3% of full-term newborns, 21% of premature newborns, and 0.8-4% of 1-year-old boys.[1-3] In the eight week of intrauterine life, the testes develops in the abdominal cavity, and descend through inguinal canal to the scrotum in the third trimester.[4] In 80% of cases of UDT, a testis is palpable in the groin, and in 90% of these boys, it is associated with hernia. In these cases, conventional open orchiopexy has been accepted as a standard treatment. In 20% of cases, testis is nonpalpable and among them 20% is absent on exploration.[5] Due to increased risk of malignant transformation and infertility,[6-8] it is important to determine the presence or absence of testis. Accurate preoperative localization of nonpalpable testes has been difficult. CT scan, although noninvasive, is unable to localize such testes and carries risk of radiation.[9] Sonography and MRI are noninvasive but USG is poor in localizing the nonpalpable testes and the value of laparoscopy has been proved to have the most important role both in diagnostic and treatment of undescended testis.[7,8] Since 1976 when Cortesi and associates first described laparoscopic diagnosis of a nonpalpable testis,[10] this method for diagnosing a nonpalpable testis has been established as the most reliable one. Since 1992 when the first laparoscopic orchiopexy was reported by Jordan et al.,[11] laparoscopic orchiopexy has obtained wide popularity with technological advances. The final goals of orchiopexy are to keep the testes viable in optimal position within the scrotum. We aimed to evaluate the safety and efficacy of laparoscopic orchiopexy in management of nonpalpable intra-abdominal testis in our settings. It was carried out after gaining experience in laparoscopic cholecystectomy, laparoscopic appendectomy and laparoscopic herniotomy. A three years experince on testicular positing in Rajshahi Medical College Hospital is being reported performed by retrospective review of patient records.

Methods

We reviewed pre and postoperative medical records including clinical results and complications of 28 patients (32 testicular units) who underwent laparoscopic orchiopexy for a non-palpable intra-abdominal testis between January 2010 and December 2012 in the department of pediatric surgery, Rajshahi Medical College Hospital. Data were collected by using a data collection sheet. The data collection sheet was designed to record the information regarding age of the patients, affected side, location of the testis at the time of laparoscopy, operation performed, operative time, complications and the surgeon who performed the surgery. The age of the children when undergoing the laparoscopic orchiopexy ranged from 2.5 to 11 years, with a mean age of 3.4 years. Initially, diagnostic laparoscopy is performed under general aesthesia to locate the testis, distance from the internal ring and presence of hernia, if any.

The testicle was classified as peeping (at the internal inguinal ring (IIR)) or low (within 3 cm from the IIR) or high(> 3 cm from the IIR); primary laparoscopic orchiopexy (PLO) was performed if peeping or low, one-or two-staged Fowler- Stephens laparoscopic orchiopexy (FSLO) if high, or PLO if atrophic,

All patients were followed up post-operatively at 1 month and 3 months thereafter for a mean post-operative follow-up of 14.8 months with highest up to 36 months and findings noted included: surgical site infections, post-operative testicular location, and testicular size, measured at the time of surgery and compared to the normal contralateral testis on follow-up.

Data were entered in the computer and processed using SPSS for windows. Descriptive techniques involving frequency distribution, computation of percentage etc. were applied.

Surgical procedure

All laparoscopic orchiopexy were done under general anesthesia. A stab incision was made in umbilicus through which a Veress needle was inserted and CO_2 was insufflated at a pressure of 10-12 mmHg. A 5 mm laparoscopy port was inserted after enlarging the umbilical stab incision. This port was restricted for the use of a laparoscope with an attached camera that was connected to a television monitor. On the location and volume of testes, the length of vas deferens and vessels, the presence of a patent processus vaginalis, and presence of inguinal hernia were determined. Two additional 3 mm working port were inserted at the lateral border of the rectus muscle in each flank under visual control in order to facilitate the laparoscopic dissection. The port on the side of UDT was placed at a higher level than the umbilicus and in case of bilateral UDT both ports were placed higher. The child was then placed in Trendelenburg position and the operating table tilted away from the side of the UDT. Further procedure depended upon whether or not the testes were present and their size.

Figure-1: laparoscopic view of UDT

When the testes were found and seemed suitable size, laparoscopic orchiopexy was performed (Figur-1). The gobernaculum of the testes was transected and the dissection was performed alongside the testicular vessels, carefully teasing all the bands with good visual control. Mobilization was carried out up to the aorta and left renal vein or the aorta and venacave depending on the side involved. The vas deferens was also mobilized retaining its blood supply in the adjacent tissue (Figur-2). Practically mobilization of the testis is enough when the testis easily reaches the opposite deep ring. Through a transverse incision made in the scrotum, tip of a long curved artery forceps was guided cephalad in to the peritoneal cavity just medial to the inferior epigastric vessels. Grasping the gobernaculum, the testes were delivered in to the scrotal wound, making sure that there was no twist on

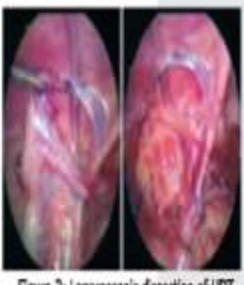

Figure-2: Laparoscopic dissection of UDT

the testicular vessels (Figure-3). The testes were then secured in the extra dartos pouch and the scrotal wound closed with vicryl.

Figure-3: Dartos pouch in Orchiopexy.

After adequate mobilization when the length is not sufficient testicular vessels are dissected after proper coagulation (Figure-4). In case of atrophied or severely hypoplastic, it was removed after diathermy of testicular vessels and vas deferens. The laparoscopy ended in all cases with deflation of peritoneum, suturing of the laparoscopy ports using Vicryl.

Figure-4: Laparoscopic dissected views of testis.

Result

By analyzing the diagnostic laparoscopic findings of the 28 UDT patients, 18 (64.3 %) were on the right, 6 (21.4%) were on the left and the rest 4 (14.3%) were bilateral. Of 32, 21 (65.6%) testicular units were located within 3 cm of the DIR among them 1 (3.1%) testicle was found atrophied, 5 (15.6%) testicular units (3 of unilateral and 2 of bilateral) were more than 3 cm from the DIR, and 6 (18.8%) testicular units were peeping testes.

Diagnostic laparoscopy was successful in localization in each of the 28 patients. Thirty one testes of the 28 patients were descended successfully by laparoscopic orchiopexy. Initially we took significantly longer time for the first 11 patients than the next 17 patients. The mean operative time was 41.5±8.8 min. Five high testicular units (> 3 cm from the DIR) underwent 1-stage FSLO (3 of unilateral and 2 of bilateral). No testicular units underwent 2-stage Fowler-Stephens orchiopexy in this series. The remaining 26 low testicular units (within 3 cm from the DIR) underwent PLO without division of any vessels. One patient needs laparoscopic orchiectomy as it was atrophied.

The clinical results within 1 month after the laparoscopic orchiopexy. One testis becomes atrophy and 30 testicular units survived, giving a testicular survival rate (TSR) of 96.8%. At the end of the follow-up (mean 14.8 months), the rest 30 (96.8%) testes maintained an adequate size, 26 (83.9%) testes were low in an acceptable scrotal position and 4 testes (12.9%) were mid to high in the scrotum without atrophy or recurrent inguinal hernia (Table 1).

Table 1: Patient's outcome

[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
			[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DISCUSSION

The experience of laparoscopic cholecystectomy, laparoscopic appendectomy and laparoscopic herniotomy has opened the door of laparoscopic management of UDT. Laparoscopy has been established as a very useful diagnostic tool in the management of children with non palpable testes.[8] The findings of this study also suggest that laparoscopy is a reliable way to locate the site of impalpable testis.

Cryptorchidism is the most common disorder of male sexual differentiation and affect about 0.8%-4% of male and 20% of these are non palpable.[10] Important long-term sequelae include infertility and testicular tumors. Orchiopexy is thought to decrease the incidence of infertility and allow early detection of tumour. The ideal age of orchiopexy is as early as 6 month. Orchiopexy is recommended at between 6 and 12 months of age as histological damage is thought to occur if delayed.[11] The age of the children in this study were several fold higher than the optimal age of laparoscopic orchiopexy. It may be due to lack of awareness and poor socioeconomic status of the parents. The people of Bangladesh should be aware about the optimal age for the management of non palpable UDT.

Traditional surgical option of non palpable undescended testes includes a staged orchiopexy,[8] orchiectomy or microvascular auto-transplantation.[8] With increasing experience in the usages finer resolution equipment and smaller (pediatric) laparoscopes, a laparoscopic orchiopexy has been shown to be feasible, easier and more effective.[4] In this study a complete

testes. Because of high degree of magnification, laparoscopy gives excellent visualization of testicular vessels up to the origin from the aorta and drainage in to the renal vein and inferior venacava respectively. All adhesion to the testicular vessels can be divided with precision.
A total 28 patients, incidence of intra-abdominal non palpable UDT was higher in right side. It is in conformity with recently published data.17

Samadi et al. conducted PLO in 70.5% and FSLO in 29.5% of a total of 203 testicular units and reported a success rate of 95%, which was higher than the 76% success rate of open surgery.18 Lindgren et al. did a 6-month clinical follow-up after laparoscopic orchiopexy and reported a success rate of 93%.19 Lintula et al. reported a success rate of 88% for 19 testicular units undergoing laparoscopic orchiopexy and a success rate of 82% for 18 testicular units receiving open surgery, highlighting the excellent surgical outcomes of the laparoscopic orchiopexy.20 In this series, 14.8 months after the laparoscopic orchiopexy, the TSR was 96.8% and the rate of fixation in the lower scrotum was 83.9%. These outcomes are similar with those reported studies,18-20 and the successful results in this study confirm the clinical significance of laparoscopic orchiopexy for a non palpable intra-abdominal testis. One-stage FSLO was performed in 5 testicular units and success rate was 80%. Chang and Franco performed FSLO in 48 testicular units and reported that the success rate of one-stage FSLO was 94.3%.21 Comparing with the findings of these studies, the success rate of the FSLO in the present study was relatively unsatisfactory, it might be due to small number of cases. Improved results are expected in the near future after accumulating experience with FSLO for non palpable intra-abdominal testis.

In case of non palpable UDT , the reported rate of orchidectomy seems to vary between 14% 2 and 48%. 16 In this series, the orchidectomy rate is 6.25%. Our decision at the time of laparoscopy to carry out orchidectomy was supported by subsequent histopathological result.

CONCLUSIONS

Laparoscopic Orchiopexy certainly avoids a groin or laparatomy incision. It is safe and effective to manage a non palpable intra-abdominal testis. It should be a method of choice for a non palpable intra-abdominal testis.

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