

Laparoscopic Single Stage Vessel Sparing Orchiopexy

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ABSTRACT

Objective To find out effectiveness of primary laparoscopic orchiopexy and single stage vessel sparing technique for intra-abdominal testis.

Study design Retrospective study.

Place & Duration of study Department of Paediatric Surgery Peoples University of Medical & Health Sciences Nawabshah, from September 2011 to September 2015.

Methodology After approval from hospital ethical committee, data of patients with undescended non-palpable testes were reviewed. Ultrasonography was done in all cases. Variables analyzed included patients' age, laterality of testis, laparoscopic findings and postoperative complications.

Results Data of 100 patients was reviewed. There were 110 undescended impalpable testicles (UIT). Age ranged from infancy to 12 year. Most (80%) of the patients were between 1-5 year of age. Fifty-five patients had right sided impalpable testis, 35 left sided and 10 patients had bilateral UIT. Laparoscopy was performed in all. At endoscopy 78 testicles were intra-abdominal in position. In these patients single stage vessel sparing orchiopexy was done. Orchiectomy was performed in five patients due to impression of being atrophic. Laparoscopy revealed 10 canalicular testis. In these patient inguinal explorations was done and orchiopexy performed.

Conclusions Laparoscopic single stage vessel sparing technique was safe and orchiopexy was successfully performed. Testicular viability was noticed in 97.5% units.

Key words Laparoscopy, Intra-abdominal testes, Single stage orchiopexy.

INTRODUCTION:

Non-palpable testis, although rare, remained a controversial subject and there is an ongoing debate with regards to investigations and accurate diagnosis. In 1976 Cortesi et al, were the first to introduce laparoscopy for evaluation of impalpable testis, which is now a gold standard modality for the management of intra-abdominal testis.¹

In 1991, Bloom reported laparoscopic Fowler-Stephens staged procedure.² Three years later Jordan et al reported single stage laparoscopic assisted orchiopexy.³ This is an era of minimal invasive surgery. New techniques are being introduced and refinements made in the management of non-palpable testis. Aim of this study was to find out if primary laparoscopic orchiopexy or single stage vessel sparing technique was effective and feasible for intra-abdominal testis.

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METHODOLOGY:

This was a retrospective study which was conducted in the Department of Paediatric Surgery Peoples University of Medical & Health Sciences Nawabshah, from September 2011 to September 2015. After approval from hospital ethical committee, data of patients with non-palpable testes were

reviewed. Ultrasonography was done in all cases for localization of testis. Data was collected on age of the patient, laterality of testis, laparoscopic findings and postoperative complications.

All patients were operated under general anesthesia in supine position with slight Trendelenberg's tilt. Urinary bladder was emptied by Foley catheter. Few patients were given micro enema to evacuate bowel before surgery. First port was introduced through umbilicus (5 mm, 0° camera) by open technique. Two 3 mm working ports were placed in right and left lower abdomen in mid-clavicular line. Carbon dioxide was insufflated at 10-12 mmHg pressure and flow rate kept between 1-1.5ml/min.

After introducing telescope, testis location, size, and distance from internal ring, length of spermatic vessels and any other associated problems were noted. Further steps were taken according to the findings at laparoscopy. Single stage vessel sparing laparoscopic orchiopexy was performed in intra-abdominal testicles including high intra abdominal testis (>2-3cm from internal inguinal ring). Peritoneum over the spermatic vessels was incised as high as possible. Similarly peritoneum over the vas deferens on medial and lateral side was dissected up to the base or underneath the urinary bladder, taking care not to damage it. By this technique, testicular vessels got length, which facilitated in bringing testis down to scrotum, without creating any new opening medial to epigastric vessels. (Fig I). All patients were followed in outpatient department at postoperative week 1, then monthly for 6 months and at one year. During follow-



Fig I: Ports placement and intra-abdominal testicular position

up, clinical examination and Doppler ultrasound were done to check position, size and blood flow to testis.

RESULTS:

A total of 100 patients were included in this study

with 110 impalpable testicles. Age of the patients ranged from infancy to 12 years. Eighty patients were between 1- 5 year of age. In 55 patients right testis was impalpable, 35 patients had left sided and 10 patients bilateral IUDT.

Laparoscopy performed in all cases. Details are given in table I. In 78 testicles, laparoscopic single stage vessel-sparing orchiopexy was performed. Orchiectomy was done in 5 atrophic testicles. In 10 patients with canalicular testes, inguinal exploration was done.

Postoperative complications of high and low intra-abdominal testicles are given in table II

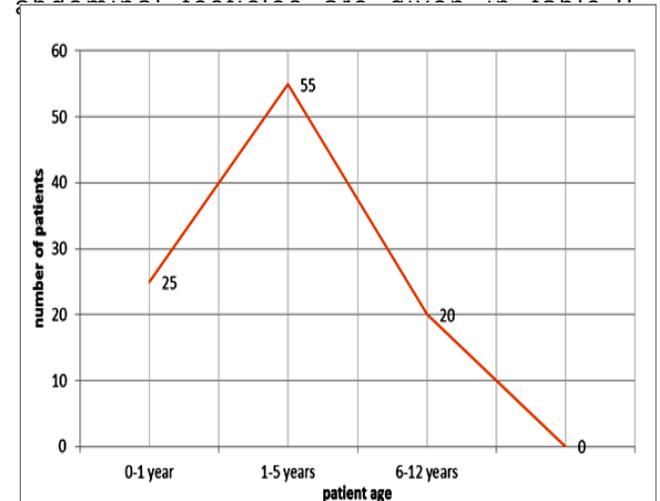


Fig II: Number of patients with age groups

DISCUSSION:

Undescended testis is a common genitourinary problem seen in 1-3% male infants and 20% of them are non-palpable.⁴ Before advent of laparoscopy it was difficult to diagnose non palpable testis (NPT). Laparoscopy is considered gold standard for diagnosing NPT.^{5,6}

Pediatric laparoscopy is fast growing in Pakistan. Initial experience of laparoscopy from Pakistan has been reported in literature by various surgeons.^{7,8} They shared their initial experience of laparoscopic orchiopexy for impalpable testis. Their experience was based upon Fowler Stephen approach. Our study aimed to preserve testicular vessels and perform one stage orchiopexy for intra-abdominal testis located 2-3cm from internal inguinal ring.

In this study most of the patients were between 1-5 year of age. This may be due to lack of knowledge on part of referring physicians. Late referral may affect future fertility potential in these patients.⁹ Unilateral undescended testis is more

Table I: Laparoscopic Findings and Procedures Done

Laparoscopic Findings	Number of testicles (n=110)	Procedure Done
Intra-abdominal testis	78	Single stage vessel sparing (both high and low testicles)
High (> 2cm – 3cm Internal Inguinal Ring)	40	
Low (< 2cm Internal Inguinal Ring)	38	
Atrophic testis	5	Orchiectomy
Canalicular testis	10	Inguinal exploration
Nubbin	4	Nubbin removed
Vanishing (blind ending vas and vessels)	6	
Absent (no vas and vessels)	7	

Table II: Postoperative Complications

Postoperative Complications	High Intra abdominal Testis (n=40)	Low Intra abdominal Testis (n=38)	Total (n=78)
Scrotal Wound Infection	None	1 (2.6%)	1 (1.3%)
Hematoma	1 (2.5%)	1 (2.6%)	2 (2.56%)
Testicular Position			
High scrotal	3 (7.5%)	1 (2.6%)	4 (5.1%)
Mid scrotal	22 (55%)	4 (10.5%)	26 (33.3%)
Low scrotal	15 (37.5%)*	33 (86.4%)*	48 (61.5%)*
Atrophy *	1 (2.5%)	1 (2.6%)	2 (2.56%)

common than bilateral. In our study right side was involved more than left which has been reported in other series as well.¹⁰

Our study showed superiority of laparoscopy in making diagnosis in patients with non-palpable testis as documented by others.^{6,11,12} Laparoscopy helped in identifying testis, localizing its position, size, distance from internal inguinal ring, vascular anatomy and contralateral testis. Surgical planning was also facilitated.^{13,14}

Laparoscopic Fowler Stephen technique, either single or stage procedure is commonly performed for intra-abdominal testis as testicular vessel length is a limiting factor.¹⁵⁻¹⁷ Proponents of staged Fowler Stephens procedure believe that neovascularization will develop maximally in six months of interval between two stages. Primary Fowler Stephen technique may increase the chance of vasospasm and testicular atrophy.^{18,19} Recently, few surgeons approached intra-abdominal testis without dividing vessel.²⁰⁻²² Ostile et al in their study compared primary and staged Fowler Stephen technique and

concluded that primary Fowler Stephen is more effective in terms of cost, and testicular survival.²³ A multi-institutional analysis by Baker et al showed overall success rate of 97.2% in primary laparoscopic versus single stage and 2-stage Fowler Stephen technique (74.1%, 87.9%). They also reported that atrophy was more common in Fowler Stephen orchiopexy group either single or staged than primary laparoscopic orchiopexy (22.2%, 10.3% versus 2.2%) and in terms of testicular position; 0.6% of primary laparoscopy group had bad testicular position versus single / staged Fowler Stephen (7.4% / 1.7%). Within this series, single stage Fowler Stephen operation resulted in a high failure rate than two-stage Fowler Stephen orchiopexy.²⁴ In our study, only two patients had atrophy of testis and testicular position was good in 48 patients. In patients of high intra-abdominal testis, issue of testicular position were more common.

CONCLUSIONS:

Laparoscopic single stage vessel sparing technique was safe. Testicular salvage was found in high number of cases.

REFERENCES:

1. Cortesi N, Ferrari P, Zambarda E, Manenti A, Baldini A, Morano FP. Diagnosis of bilateral cryptorchidism by laparoscopy. *Endoscopy*. 1976;8:33-4.
2. Bloom DA. Two-step orchiopaxy with pelviscopic clip ligation of the spermatic vessels. *J Urol*. 1991;145:1030-3.
3. Jordan GH, Winslow BH. Laparoscopic single stage and staged orchiopaxy. *J Urol*. 1994;152:1249-52.
4. Abbas TO, Hayati A, Ismail A, Ali M. Laparoscopic management of intraabdominal testis: 5-year single-centre experience a retrospective descriptive study. *Minim Invasive Surg*. 2012; 2012:878509.
5. Papparella A, Romans M, Noviello C, Cobellis G, Nino F, Del Monaco C, et al. The value of laparoscopy in the management of non-palpable testis. *J Pediatr Urol*. 2010;6:550-4.
6. Radmayr C, Oswald J, Schwenter C, Neurter R, Peschel R, Bartsch G. Long-term outcome of laparoscopically managed nonpalpable testes. *J Urol*. 2003; 170:2409-11.
7. Mehmood MT, Khan SA, Ahmad J, Athar MS, Ashraf MS, Rasool NA, et al. Preliminary results of laparoscopic assisted orchidopexy for intra-abdominal testis. *Pak J Surg*. 2007;23:136-40.
8. Sheikh A, Mirza B, Ahmad S, Ijaz L, Kayastha K, Iqbal S. Laparoscopic management of 128 undescended testes: Our experience. *Afr J Paediatr Surg*. 2012; 9:106-8.
9. Holland AJ, Nassar N, Schneuer FJ. Undescended testes: an update. *Current opinion in pediatrics*. 2016;28:388-94.
10. Srivastava S, Singh K, Srivastava S. Anatomical correlation of undescended testes. *Indian J Clin Anatomy Physiol*. 2016;3:370-2.
11. Samadi AA, Palmer LS, Franco I. Laparoscopic orchiopexy: report of 203 cases with review of diagnosis, operative technique, and lessons learned. *J Endourol*. 2003;17:365-8.
12. Riquelme-Heras MA, Landa-Juárez S, Miguel-Gómez D, Meneses-Juárez H, Andraca-Dumit R. Laparoscopic orchidopexy in palpable and nonpalpable undescended testis. *Revista Mexicana de Urología*. 2009;69:215-8.
13. Kim J, Min GE, Kim KS. Laparoscopic orchiopexy for a nonpalpable testis. *Korean J Urol*. 2010;51:106-10.
14. Papparella A, Romano M, Noviello C, Cobellis G, Nino F, Del Monaco C, et al. The value of laparoscopy in the management of non-palpable testis. *J Pediatr Urol*. 2010;6:550-4.
15. Esposito C, Caldamone AA, Settmi A, El-Ghoneimi A. Management of boys with nonpalpable undescended testis. *Nature Clin Pract Urol*. 2008;5:252-60.
16. Moursy EE, Gamal W, Hussein MM. Laparoscopic orchiopexy for non-palpable testes: outcome of two techniques. *J Pediatr Urol*. 2011;7:178-81.
17. Lindgren BW, Franco I, Blick S, Levitt SB, Brock WA, Palmer LS, Friedman SC, Reda EF. Laparoscopic Fowler-Stephens orchiopexy for the high abdominal testis. *J Urol*. 1999;162:990-3.
18. Fowler R, Stephens FD. The role of testicular vascular anatomy in the salvage of high undescended testes. *Aust NZ J Surg*. 1959;29:92-106.
19. Docimo SG. The results of surgical therapy for cryptorchidism: a literature review and analysis. *J Urol*. 1995;154:1148-52.
20. Esposito C, Vallone G, Settmi A, Sabin MG, Amici G, Cusano T. Laparoscopic orchiopexy without division of the spermatic vessels. *Surg Endosc*. 2000;14:658-60.

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21. Basu AK, Basu J. One stage laparoscopic orchidopexy without division of spermatic vessels. *J Indian Assoc Paediatr Surg.* 2002;7:195-8.
22. Bhaskar V, Sahoo MR. Laparoscopic orchidopexy without division of spermatic vessels using a neinguinal canal approach: A single center experience. *World J Surg.* 2013 ;6:121-6.
23. Ostlie DJ, Leys CM, Fraser JD, Snyder CL, St. Peter SD. Laparoscopic orchiopey requiring vascular division: a randomized study comparing the primary and two-stage approaches. *J Laparoendosc Adv Surg Tech.* 2015;25:536-9.
24. Baker LA, Docimo SG, Surer I, Peters C, Cisek L, Diamond DA, Caldamone A, Koyle M, Strand W, Moore R, Mevorach R. A multi-institutional analysis of laparoscopic orchidopexy. *BJU int.* 2001;87:484-9.
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