

## Laparoscopic Orchidopexy: Current Surgical Opinion.

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### ABSTRACT:

#### BACKGROUND:

With the use of diagnostic laparoscopy widely accepted in the setting of the non palpable testes, now day's laparoscopic orchidopexy is an efficient and logical alternative to open orchidopexy.

#### OBJECTIVE:

We reviewed the efficacy of laparoscopy for diagnosing the intra abdominal testes.

Also we review the efficacy of primary orchidopexy, one stage and two stages laparoscopic orchidopexy for the management of the intra abdominal testes.

#### PATIENTS AND METHODS:

Prospective Study includes 20 boys with 23 impalpable testes (3 patients were bilateral). underwent laparoscopy for a non palpable testes at urosurgical department between June 2007 and February 2009.

Their age ranged between 3years and 7 years. Eight patients had primary laparoscopic orchidopaxy without division of spermatic vessels .twelve patients had one stage Fowler Stephen method, and Two patients had two stages Fowler Stephen method.

#### RESULTS:

During diagnostic laparoscopy: Bilateral abdominal testes was found in 3 patients, Left intra abdominal tests was found in 10 patients, while right intra abdominal testes was found in 7 patients .With the use of laparoscopic orchidopexy : twenty two testes were brought down to the scrotum: sixteen testes (72.7%) brought down to the normal scrotal site, while six testes (27.2 %) were placed at high scrotal position. Orchiectomy was done for one (4.3%) intra abdominal testis.

#### CONCLUSION:

Laparoscopy is extremely effective for diagnosis and treatment of patients with non palpable testes. Laparoscopic orchidopexy is the logic extension of diagnostic laparoscopy for intra abdominal testes.

**KEY WORDS:** laparoscopic orchidopexy, undescended testis.

### INTRODUCTION:

Laparoscopy has attained its greatest degree of general acceptance, both diagnostically and therapeutically, in the realm of pediatric urology for the management of a non palpable testis. Since the earliest reported cases over a quarter of a century ago, there are now several thousand cases in the literature documenting the impact that laparoscopy has made in the management of a non palpable testis <sup>(1)</sup>.

The principles of surgery for a non palpable testis are equal to, if not enhanced by a laparoscopic approach; exposure, lighting, and magnification remain critical to this pediatric procedure <sup>(2)</sup>. However, the advantages of laparoscopy over a conventional "open" surgical approach to a non palpable testis include accurate anatomic assessment of testicular position and viability and, when necessary, optimal accessibility to the crux of the surgical problem <sup>(3)</sup>.

There are three distinct possible findings, and courses of action, when laparoscopy is used to assess a non palpable testis. Findings include : Blind-ending vessels above the internal ring (vanishing testis), Cord structures entering the internal ring (viable intracanalicular testis versus an intracanalicular or scrotal atrophic testis), and Intra-abdominal testis <sup>(4)</sup>.

An intra-abdominal testis is usually found within 1 to 2 cm of the internal ring, which is usually patent and primary orchidopexy without division of the spermatic vessels can be performed <sup>(5)</sup>.

If the testis is immobile and beyond 2.5 cm from the internal ring, it may be prudent to perform a staged orchidopexy consisting of clipping the internal spermatic vessels and returning 6 months later to mobilize the testis with collateral vessels and the deferential artery <sup>(6)</sup>.

Laparoscopic Fowler-Stephens Orchidopexy  
The spermatic vessels are usually the length-limiting factor in accomplishing a tension-free

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orchidopexy. The decision whether to divide these vessels needs to be made early in the course of laparoscopic orchidopexy<sup>(7)</sup>. There are no absolute criteria for when transection needs to be performed, but the obvious maxim is the further the distance that the testis is from the scrotum, the greater the likelihood that vessel transection will be necessary<sup>(8)</sup>. As a general guideline, a testis within 2 cm of the internal ring can be brought down without vessel transection, between 2 and 4 cm is a gray area, and beyond 4 cm vessel transection needs to be seriously considered before any peritoneal dissection<sup>(4)</sup>.

Keeping in mind that staged orchidopexy carries risk rate with regard to testicular atrophy<sup>(9)</sup>. However, if a single-stage Fowler-Stephens orchidopexy is the intended or possible procedure, the peritoneum between the spermatic vessels and the vas deferens needs to be carefully preserved to prevent disruption of the collateral vasculature<sup>(10)</sup>. Vessel transection may not be as necessary in children younger than 1 year because the critical distance of the testis to the scrotum is not significantly more than that for an intracanalicular testis<sup>(8)</sup>.

### **PATIENTS AND METHODS :**

During the period between June 2007 and February 2009, We have performed laparoscopy on 20 boys with 23 impalpable testes (3 cases were bilateral), at urosurgical department, surgical specialties hospital in medical city.

Their age ranged between 3 years and 7 years.

All operations were performed under general anesthesia.

All patients (scrotal and inguinal regions) were examined under general anesthesia.

Laparoscopy was performed through a 10mm infra umbilical port for 0 degree telescope and two iliac fossa ports of 5 mm size for the operative instruments.

The patient was positioned head down with a right or left tilt depending on the side being operated upon.

A Foley's catheter was introduced into the urinary bladder at the initiation of the procedure and was removed at night of surgery.

Pneumoperitoneum was created using a Veress needle, and Laparoscopy was performed at 8-10 mm pressure.

Diagnostic Laparoscopy was done first, and assessment of the testes location, size, and proximity to the internal inguinal ring.

We classified the laparoscopic findings according to the testis location into three groups:

Group A: Where the testis located within 2 cm from the internal inguinal ring.

Group B: Where the testis located between 2-4 cm from the internal inguinal ring.

Group C: Where the testis located more than 4 cm from the internal inguinal ring.

Eight patients (with group A) had primary laparoscopic orchidopexy without division of spermatic vessels:

The testis was mobilized by division of gubernaculum and making an incision on the posterior peritoneum lateral to testicular vessels.

The testicular vessels and the vas deferens were mobilized for a length of 6-8 cm using blunt dissection.

An adequately mobilized testis is the one that reach the opposite internal ring without tension, and there are no limiting spermatic vessels.

Twelve patients (All patients with group B and four patients with group A) had one stage Fowler-Stephens procedure because, the presence of limiting spermatic vessels after complete dissection, The testes managed by laparoscopic mobilization followed by laparoscopic vessel clipping, transection and orchidopexy in one stage,

Two patients (with group C) had been managed by two stages Fowler-Stephens procedure. The first stage include clipping and transection the spermatic vessels and meticulous mobilization of the testis near the internal inguinal ring, the second stage performed 6 months later to enhance formation of collateral vessels and testes mobilized to the scrotum by open technique.

Seven testes were brought down through a new opening created in the anterior rectus sheath medial to inferior epigastric vessels (Closed internal inguinal ring); the other fifteen testes were brought down through the patent inguinal canal. All testes were placed in subdartos pouchs.

Transfer of the testis into the scrotum has been done by making small scrotal incision and passing a curved hemostat from the subdartos pouch over the symphysis pubis into the peritoneal cavity where the laparoscope can guide its path medial to the obliterated umbilical artery, The testis then grasped and placed into subdartos pouch, an external nylon fixation button is useful in maintaining testicular position securely in the scrotum when tension is present.

One testis located in higher location (group C) was atrophied and was removed laparoscopically (laparoscopic orchidectomy):

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By clipping of the spermatic vessels and vas deference and testis extraction through 10 mm iliac fossa port (which replace the already inserted 5 mm iliac fossa port).

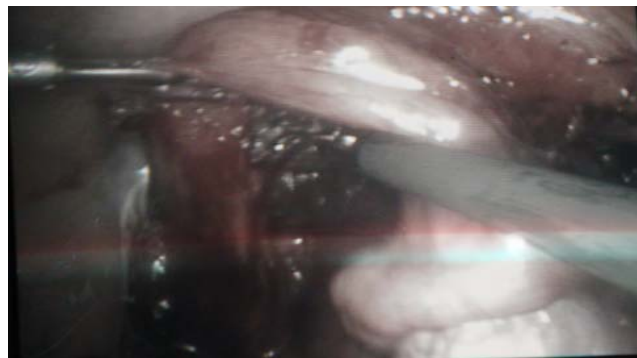
The operating time for laparoscopic procedures ranged between 45 minutes to 104 minutes.

All patients required analgesia in the post operative period.

Most patients were fit to go home the next day.



**A-Laparoscopic view of intra abdominal testis.**



**B-Laparoscopic dissection of the spermatic vessels.**

### RESULTS:

We have performed laparoscopy on 20 boys with 23 impalpable testes. Their age ranged between 3years and 7 years.

Bilateral abdominal testes was found in 3 patients, Left intra abdominal tests was found in 10 patients, while right intraabdominal testes was found in 7 patients.(Table 1).

**Table 1: Break-up of patients**

AGE	3 years	3
	4 years	10
	5 years	7
	6 years	2
	7 years	1
	Total No.	23
SIDE	BILATERAL	3
	LEFT	10
	RIGHT	7
	Total No.	23

The laparoscopic findings during diagnostic laparoscopy was mentioned on (Table 2).

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**Table 2: Laparoscopic finding**

Testis location	Group	No.	%
Adj.to int. ing .ring	A	12	52.1
2-4cm from the int. ing. Ring.	B	8	34.7
More than 4 cm from the int. ing. Ring.	C	3	13.2
total		23	100

Ten boys had left empty scrotum and 7 had right empty scrotum, while the other 3 had bilateral empty scrotal sacs.

Eight patients(group A) had primary laparoscopic orchidopaxy without division of spermatic vessels . Twelve patients (group B and four patients of group A) had one stage Fowler Stephen procedure.

Two patients with high intra abdominal testes (group C) were managed by two stages Fowler Stephen procedure.

One testis located in higher location (group C) was found to be atrophied and was removed laparoscopically ( laparoscopic orchidectomy). (Table 3).

**Table 3: Types of Surgical procedures**

Type of Procedure	No. Of Patients	%
Primary Orchidopexy	8	34.8
One stage Fowler Stephen method.	12	52.2
Two stages Fowler Stephen method.	2	8.7
Orchidectomy	1	4.3
Total	23	100

Of the 22 testes brought down to the scrotum 16 site, 6 (27.2%) are at high scrotal position. (Table testes (72.7%) brought down to the normal scrotal 4).

**Table 4: Percentage of testicles brought down to the scrotum**

Type of the procedure	No. of the testicles operated	No. of the testicles brought down to the scrotum	%
Primary orchidopexy	8	7	87.5%
one stage Fowler-Stephens procedure	12	8	66.6 %
Two stage Fowler-Stephens procedure	2	1	50%
Total	22	16	72.7%

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The complications encountered with the laparoscopic orchidopaxy were listed on (table 4). On Doppler study was performed one month post operatively, two patients with one stage Fowler-

Stephens procedure had decrease vascularity and testis size (testicular atrophy).

Difficult dissection was observed in one patient with two stages Fowler-Stephens procedure (operative time about two hours) because of fibrosis.

**Table 4: Complications with the laparoscopic orchidopaxy**

Complications	No.	%	Management
Port infection	1	4.3	Local dressing and antibiotic treatment
Gaseous swelling of the scrotum.	1	4.3	Resolved spontaneously within 48 hours.
Prolonged illus for 24-36 hours.	2	8.6	Resolved spontaneously
Testicular atrophy (one stage Fowler-Stephens procedure).	2	8.6	Follow up
Difficult dissection (Two stages Fowler-Stephens procedure).	1	4.3	Meticulous dissection

### DISCUSSION :

Laparoscopic orchidopaxy is now standard in the urologists' armamentarium of management for an intra-abdominal testis.

A laparoscopic approach in the management of an intra-abdominal undescended testis has advantages over open orchidopaxy performed through either an extended inguinal incision or a high inguinal incision<sup>(11)</sup>. Laparoscopy accurately assesses the presence, absence, viability, and entire anatomy of an intra-abdominal testis. Success in testicular mobilization may require complete and proximal dissection of the spermatic vessels and redirecting the line of "descent" to the shortest distance to the scrotum.

Laparoscopic orchidopaxy allows accessibility to the entire course of the spermatic vessels to their origin, usually the limiting factor in tension-free mobilization of an intra-abdominal testis. Dissection close to the origin of the spermatic vessels is possible because the surgeon's range of motion with laparoscopic instrumentation extends across the entire abdominal cavity. Magnification of these delicate vessels aids in dissection and preservation of the main and collateral blood supply. Primary laparoscopic orchidopaxy (without division of the spermatic vessels) is the procedure of choice for intra abdominal testis located adjacent or within 2 cm from the internal inguinal ring because the preservation of the spermatic vessels.<sup>(12)</sup>

We classify the laparoscopic findings into three

groups depend on the distance of the abdominal testis from the internal inguinal ring, and we performed eight (66.6%) primary laparoscopic orchidopaxy on group A .Other testes had not been brought to the scrotum with out clipping and transaction of the spermatic vessels, for whom, we performed one stage Fowler-Stephens orchidopaxy for the testes located up to 4 cm from the internal inguinal ring to avoid the morbidity of the second procedure. Testis located more than 4 cm from the internal inguinal ring had not been brought to the scrotum with out staged procedure.

Success rates of laparoscopic orchidopaxy were comparable to the published results for laparoscopic orchidopaxy and are based on postoperative testicular position and viability<sup>(13)</sup>.

In present study we successfully replaced 16 testicles (72.7%) to their normal lower scrotal positions while other six testicles (27.2%) were placed in higher scrotal position. Success rates were dependent on the nature of surgical method (87.5%) for "primary" laparoscopic orchidopaxy, (66.6 % ) for one-stage Fowler-Stephens orchidopaxy, (50%) for two-stage Fowler-Stephens orchidopaxy), with an overall atrophy rate of 8.4%. Although testicular atrophy is a well-recognized complication of orchidopaxy, especially for an intra-abdominal testis, it has been more apt to occur in patients who have undergone previous surgery, presumably because of dissection around the vas deferens. Atrophy rates were found to be

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highest in the single-stage Fowler Stephens orchidopexy (16.6%). In one study by ( Baker et al ), Success rates were (97.2% for "primary" laparoscopic orchidopexy, 74.1% for one-stage Fowler-Stephens orchidopexy, 87.9% for two-stage Fowler-Stephens orchidopexy), with an overall atrophy rate of 6.1%. Atrophy rates were found to be highest in the single-stage Fowler-Stephens orchidopexy at 22%, whereas atrophy occurred in only 2% of testes after a straightforward laparoscopic orchidopexy<sup>(14)</sup>.

(Chang et al ) reported a large single-group experience with similar success rates for all laparoscopic techniques of orchidopexy, specifically, an overall 85% success rate for one- or two-stage Fowler-Stephens procedures with a 4% failure rate as a result of atrophy<sup>(15)</sup>.

The results of this study represent the initial Iraqi experience with laparoscopic orchidopexy and actually it will be more promising in future with the improvement of our experience with such laparoscopic techniques.

### CONCLUSION:

1-Laparoscopic is extremely effective for diagnosing and treating patients with non palpable testis.

2-Laparoscopic orchidopexy is the logic extension of diagnostic laparoscopy for intra abdominal testes.

3-Primary laparoscopic orchidopexy (without division of the spermatic vessels) is the procedure of choice for intra abdominal testis located adjacent or within 2 cm from the internal inguinal ring.

4-For high intra abdominal testes in wih vessel length prevents the testis from reaching the scrotum, Fowler-Stephens procedure (one stage or two stage) can be used.

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