

Laparoscopic Orchiopexy for High Intra Abdominal Undescended Testis , One Stage or Two Stages Fowler-Stephens Orchiopexy ; A Comparative Study

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ABSTRACT:

BACKGROUND:

Laparoscopic management of the high intra abdominal testis is still a matter of controversy. Laparoscopic Fowler-Stephens orchidopexy (FSO) is performed either by one stage (laparoscopic clipping and division of the spermatic vessel and proceed for orchiopexy at the same time) or by two stages FSO (laparoscopic clipping and division of the spermatic vessel only and performing laparoscopic release of the testis along with orchiopexy 3-6 months later).

OBJECTIVE:

To study the outcome of Laparoscopic one stage and two stages FSO for the management of high intra abdominal testes.

PATIENTS AND METHODS:

A prospective comparative clinical Study included 25 patients (21 unilateral and 4 bilateral non palpable abdominal testes , 29 testes in total) and laparoscopic surgical procedures (One stage FSO was done for 18 testicles and Two stages FSO was done for 11 testicles) were performed at the urology department ,Medical city complex, Iraq , during the period between December 2010 and March 2013 . Their mean age was 3.2 years.

The comparative criteria include; Time of surgery, postoperative complications, testicular position, and testicular viability.

RESULTS:

Testicular Doppler study revealed four atrophied testes of one stage F.S.O. (22.2%), two atrophied testes among two stages FSO group (18 %) ,this difference was statistically non significant . The difference in the proper scrotal position also was not significant. The operative time difference was significant between both groups (86.6 ± 10.1 min. for one stage vs 122.7 ± 13.5 min. for two stages FSO).

CONCLUSION:

One-stage FSO avoids repeated anesthesia and the potential for extensive, sometimes tedious, dissection that is occasionally required during re operation, and shorter operative time, making it more optimal than two stages FSO.

KEYWORDS: laparoscopic orchidopexy, laparoscopic fowler-stephens orchidopexy.

INTRODUCTION:

Cryptorchidism is one of the most common congenital genital anomalies, occurring in 1% to 4% of full-term and 1% to 45% of preterm male neonates ⁽¹⁾.

The testis cannot be palpated in approximately 20% of all cases of undescended testicles . Most of the impalpable testes are intra-abdominal although an impalpable testis does not exclude an

intra canalicular or absent testis. ^(2,3).

Primary laparoscopic orchidopexy by laparoscopic mobilization of the testis without spermatic vessels division is the treatment of choice for low intra abdominal testis (lying within 2 cm of the internal inguinal ring). ⁽⁴⁾.

Among several options in the surgical management of high intra abdominal testis (staged orchiopexy, transperitoneal or retroperitoneal dissection via an extended inguinal or Pfannenstiel incision, Fowler-Stephens orchiopexy in 1 or 2 stages , microvascular transplantation) , The technique described by Fowler and Stephens in 1957 seems

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to have a higher success rate^(5,6). Diagnostic laparoscopy will help in determining intra-abdominal testicular anatomy and the feasibility of a primary, single or two-stage orchidopexy or orchiectomy if indicated.^(7,8) The spermatic vessels are usually the length-limiting factor in accomplishing a tension-free orchidopexy. The decision whether to divide these vessels needs to be made early in the course of laparoscopic orchidopexy⁽⁹⁾.

There are no absolute criteria when transaction 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 transaction will be necessary⁽¹⁰⁾. Laparoscopic Fowler-Stephens Orchidopexy procedure is now typically performed laparoscopically with spermatic vessel clipping and division followed by laparoscopic mobilization and orchidopexy at once (one stage FSO) or 3- 6 months later (two stage FSO)^(11,12).

We reviewed the outcome of Laparoscopic one stage and two stages Fowler-Stephens orchidopexy(FSO) for the management of high intra abdominal testes and to assess which one is optimal procedure.

PATIENTS AND METHODS:

During the period from December 2010 to December 2012, we performed laparoscopy for high intra abdominal testes on 29 impalpable testes in 25 cases in the department of urology, Gazi Al.Hariri hospital, medical city, Iraq; the problem was bilateral in 4 cases and unilateral in 21 cases, Patients aged between (2- 4years).

We exclude from this study the low lying intra abdominal testicles which managed by primary laparoscopic orchidopexy without vessels transaction, also atrophic testicles which managed with laparoscopic orchidectomy and Vanishing testicles.

The preoperative scrotal and Doppler ultrasound for localization of the testicle was performed in all patients. One stage FSO was done in 18 testicles and two stages FSO was done in 11 testicles by the same surgical team after informed consent. The comparative criteria include; time of surgery, postoperative complications, postoperative testicular position, and testicular viability (assessed by Doppler study).

After induction of anesthesia, a further attempt to palpate the testis is made. After decompression of the bladder and stomach, an infraumbilical 5-mm

trocar is placed for passage of a 30-degree lens and both internal rings are visualized. An open Hassoni technique is used for umbilical trocar placement. CO₂ pneumoperitoneum to a maximum pressure of 8 to 12 mm Hg is used.

Diagnostic Laparoscopy was done first for assessment of the testis location, size, and proximity to the internal inguinal ring is determined before further decision making.

Two accessory ports (5mm, 10mm) were placed under direct endoscopic vision at approximately the umbilical level in the midclavicular line on either side of the abdomen for orchidopexy and vessels clipping and transaction. The technique of this procedure, stressing that in cases of low intra-abdominal testicle (located less than 2 cm from the internal inguinal ring) Laparoscopic orchidopexy can be done without transaction of the spermatic vessels (these cases was excluded from this study). While in those located higher (more than 2 cm from the internal inguinal ring) the vessels were sectioned to facilitate the appropriate descent of the testicle to the scrotum. The spermatic vessels clipped with laparoscopic metallic clips and divide with laparoscopic curved seizers, the testis is relocated into the scrotum either during the same surgical procedure(Laparoscopic one stage Fowler-Stephens method) or the procedure is post pond for three to six months (two stage Fowler-Stephens method). The distance between the internal inguinal ring and the testis was measured by the opened laparoscopic curved forceps jaw which equal to 2 cm. The major steps of laparoscopic orchidopexy are mobilization of any structures extending distal to the internal ring, including epididymis and vas and division of the gubernacular remnant, transaction of the peritoneum lateral to the vessels and distal to the vas, and proximal mobilization of the vessels while maintaining collateral blood supply between the vas and spermatic vessels. The testis is brought through a new hiatus at the level of the medial umbilical ligament and placement the testis through the sub dartose pouch (Figure 1,2). The time of operation was recorded, and it was calculated from the start of port incision until the removal of the umbilical port at the end of operation. All patients were followed up postoperatively (one month after the operation) by scrotal examination and Doppler study, to assess testicular location and viability.



Figure1: Laparoscopic View of abdominal testis.

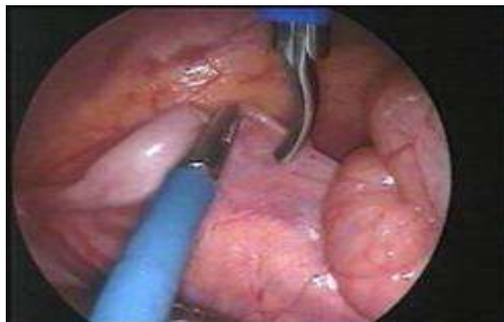


Figure 2: Laparoscopic Dissection of high intra abdominal testis.

Statistical Analysis: Chi square test was used to compare in between both groups for frequencies and percentages, Student's t test (independent 2 sample test) was used to compare means. Level

of significance (P.value) of < 0.05 is considered as significant.

RESULTS:

One stage FSO was done in 18 testis and 2 stages FSO in 11 cases (Table 1).

Table 1: Surgical approach.

Type of operation	Number of cases
1 stage F.S.O.	18
2 stage F.S.O.	11

Preoperative Ultrasound examination (US) was done for All cases and 9 of 29 (31 %) of the testes were seen by US examination and the others could not be seen (Fig. 3).

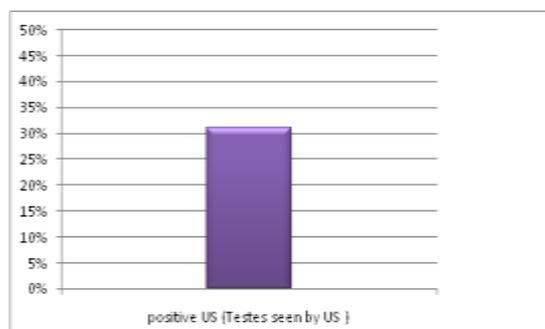


Fig. 3: US For impalpable testes.

LAPAROSCOPIC ORCHIOPEXY

The time of the operation was recorded, and it was calculated from the start of the first port incision until the removal of the Last umbilical port at the end of operation, and it was ranging

from 70-105 minute for one stage FSO (mean time is 86.6 min.).

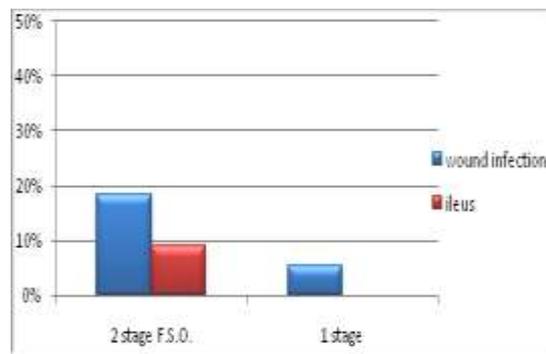
Operative time for 2 stages FSO was from 100-140 minute (the time of the two operations) and mean time is 122.7 min. which is statistically significant (Table 2).

Table 2: A comparison in operative time in between study groups.

Operative Time (min.) (Mean \pm standard deviation)		Difference
1 stage FSO	2 stage FSO	
86.6 \pm 10.1 SD	122.7 \pm 13.5 SD	36
Student's t test = 8.16		P.value= 0.0001 Significant

Wound infection occurred in 1 case of 1 stage FSO (5.5%) and in 2 cases (18.2%) of 2 stages FSO and ileus occurred in 1 cases (9.1%) of 2

stages FSO and it was treated conservatively and bowel sound returned after 24-36 hour postoperatively.(Figure 4).



Chi square =0.5

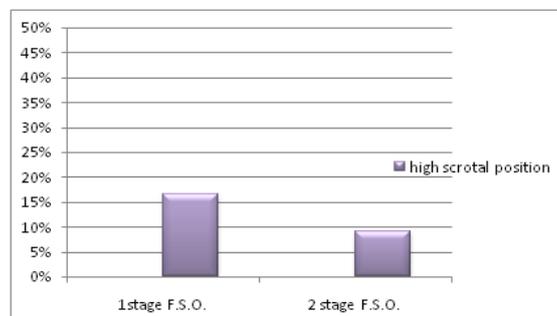
P.value = 0.47 (not significant)

Fig. 4: postoperative complications.

Follow up is done after 1months and it included clinical examination of testicular position and radiological evaluation (testicular size and vascularity assessed by US and Doppler study).

For 1 stage FSO; 3 testes (16.6 %) were high in scrotal position.

Only one testis (9.1 %) was high scrotal among those who were treated by 2 stages FSO. (Figure 5).



Chi square =0.8 \ P.value = 0.49 (not significant)

Fig. 5: Postoperative testicular position.

Doppler study revealed 4 atrophied testes of 1 stage FSO (22.2%).

584 atrophied testes had been found among 2 stage FSO group (18 %). (Figure 6).

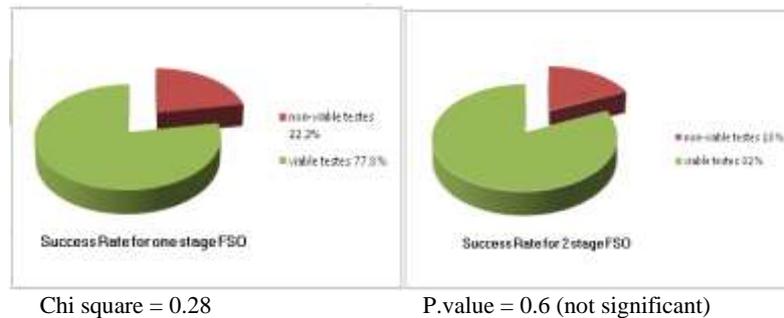


Figure 6: Testicular viability in 1 stage and 2 stage FSO

DISCUSSION:

The management of high intra-abdominal testis may be challenging in the presence of a short spermatic cord. The goal of the Fowler-Stephens maneuver during orchiopexy is to allow for more mobilization of the testis by dividing the spermatic cord vessels, which was originally done in a single stage. However, since Ransley et al described the 2-stage FSO maneuver there has been discussion about which of these techniques carries better results (13, 14).

Preoperatively, ultrasound (US) is useful to determine localization of nonpalpable testes, which facilitates planning the surgical procedure. An inguinal exploration is called when US identifies the testis in the inguinal canal. Because the sensitivity of US for localization of the abdominal testes is low, we now always perform laparoscopic exploration when US is negative and the testis cannot be palpated under general anesthesia.

Other imaging techniques like MRI still used by some centers but there specificity and sensitivity are not higher than ultrasonography. (15,16).

After transaction of the spermatic vessels the testis still viable depending on the collaterals vessels from the deferential artery a branch from inferior vesical artery and the cremasteric system a branch of the inferior epigastric artery (17).

Both one stage and two stages FSO techniques had comparable advantages and disadvantages for the management of high intra-abdominal testicles as first stage procedure may carry higher risk of testicular atrophy, the two stages may have the morbidity of the second operative procedure (18,19).

Two-stage FSO resulted in a high number of

viable testes, which may be related to a better blood supply obtained with this approach, A review by Baker et al, 2001 demonstrated testicular survival of 71% following transaction of the testicular vessels and a 88% success rate following staged orchiopexy (20).

Most authors who perform 2-stage FSO believe that the preserving of an intact peritoneum around the vas will allow the development of collateral blood supply to the testis. Avoiding dissection of the medial aspect of the peritoneum at the level of the internal ring during the second stage will also preserve the cremasteric artery, which is believed to contribute to the testicular blood supply (21). Creation of the new hiatus for passage of the mobilized testis at the level of the medial umbilical ligament shortens the pathway to the scrotum rather than passage of the testis through the original hiatus (22).

In this study the Operative time was longer with 2 stages FSO than with 1 stage that means more exposure to anesthesia, also the hospital stay and cost being more with 2 stages FSO. With highly significant difference it had been found that 2 stage FSO need longer time than 1 stage FSO.

This study also shows when diagnostic laparoscopy is combined with 1-stage laparoscopic surgery; it allows the diagnosis and treatment in one setting and, thus, one session anesthesia. This factor is the most compelling reason to perform the 1-stage procedure, since the difference in testicular viability, proper testicular position and postoperative complication was not statistically significant between two methods. Similarly Denes et al 2008 shows 88% success rate for two stage FSO with 6 % testicular

atrophy rate and Chang et al shows 84% success rate for one stage FSO with 10% testicular atrophy rate^(23, 24).

CONCLUSION:

Because there was no significant difference in the postoperative viability of the testis and testicular position, a 1-stage FSO avoids repeat anesthesia, as well as shorter operative time and the potential for extensive, sometimes tedious, dissection that is occasionally required during reoperation making it more optimal than 2 stages FSO. When there is any concern about future viability of the testis such as those patients with single testis or previous inguinal surgery two stage FSO can be considered.

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