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Single *vs.* two stage laparoscopic Stephen fowler's orchidopexy-A prospective study.

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Abstract

Background: Laparoscopic Stephen Fowler's Orchidopexy (Lap SFO) is routinely performed worldwide procedure for non-palpable testis. Some institutions prefer two stages Lap SFO and in some institute single stage SFO is performed. There has been less data regarding the comparison of single *vs.* two stages Lap. SFO in the literature. We, in our study attempted to compare these two procedures respectively.

Methods: Unilateral non-palpable UDT were included in this study. Only testes which were within 2.5 cm of Deep Inguinal Ring (DIR) were included. Patients were randomly divided into two groups 'A' and 'B'. In group 'A' patients, laparoscopic ligation of the vessel and dissection of the testicular pedicle by preserving a strip of peritoneum on both side of vas was performed. The testis was delivered through a trochar medial to Inferior Epigastric Vessel (IEV) and fixed in subdortos pouch. In group B patients, laparoscopic ligation of the vessel was performed in stage I of operation. In group 'B' stage II procedure was performed after 4 months. A strip of peritoneum on was preserved on both side of vas and vasal vessels. A trochar was inserted medial to the IEV and testis delivered in scrotum and fixed in subdortos pouch. The size of the testis was followed with USG and successful result was considered when testis was located deep in the scrotum. Procedure was considered failure if testis had altered echogenesity and testis was located above mid-scrotal point.

Results: Only unilateral cases of Non palpable Undescended Testis (NP UDTS) were included in the study. In group 'A' 28 patients. Underwent single stage SFO, while as in group 'B' 30 patients underwent staged SFO. Average age was 3.2 years ± 13 months in all 58 patients. The volume was followed at 1, 3, 6 monthly intervals after the operation. In group 'A' (20 out of 28) and group 'B' (26 out 30 patients) had testis located deep in scrotum were considered successful respectively. Overall success rate in group A and B was 71% and 86% respectively. In group 'A' and 'B' there were five and two cases of testicular atrophy respectively. This difference of success rate between the two groups was statistically significant.

Conclusion: The success rate of two staged SFO is better than that of single stage SFO. While the need for the second anesthesia is avoided in single stage SFO, but we believe it should not be at the cost of non salvageablity of testicles. We propose that staged SFO is better than single stage.

Keywords: Laparoscopic Stephen Fowler's Orchidopexy (SFO), Undescended Testis (UDT), Lap (Laparoscopic), Vasal vessels, Testicular vessels, Deep Inguinal Ring (DIR), Inferior Epigastric Vessel (IEV).

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Introduction

Laparoscopic fowler's stephens orchidopexy is a standard treatment for impalpable testis. Now a day SFO is performed either single or a two stage procedure [1]. Original SFO was a single stage operation. Ransley et al. in 1984 introduced two stage procedures with a hope that collateral vasal vascular circulation will develop after dividing the main vascular supply of the testis [2]. In this comparative study, we will be evaluating the outcome of the comparison of single *vs.* staged laparoscopic SFO.

Methods

Between January 2018 and January 2021, patients who underwent laparoscopic orchidopexy for unilateral impalpable testicles were included in this study. Testes which were within the 2.5 cm of DIR were included. The patients were randomly divided in groups 'A' and 'B'. Group 'A' included single stage SFO, while as group 'B' included patients who underwent staged SFO with a gap of 4 months in between the two stages.

All the patients were examined under GA, to confirming the impalpable nature of the UDT. Diagnostic laparoscopy was

performed with the patient in the trendelenberg position; only 5 mm ports were used. The distance of the testis from DIR was measured and only the testis with 2.5 cm of DIR testis was included in the study. Two 5 mm trochars were introduced in the right and left upper quadrant. The peritoneum was cut lateral to the testicular vessel. The testicular vessels were ligated with an edoclip 200. One cm strip of peritoneum was preserved on either side of the Vas. In single stage group 'A', 5 m trochar was introduced from a scrotal incision between the lateral peritoneal folds and IEA and testis was delivered *via* that port.

The testicle was fixed in the sub-dortos pouch with vessel to vas as pedicle. In group 'B' patients in stage second a 5 mm trochar was inserted medial to IEV and testis was dissected over vasal vessel. The testis was delivered fixed *via* a port and fixed in sub-dortos pouch. A tunnel was created to the scrotum *via* 5 mm trochar and fixed. Follow up included examination at 1,3,6 and 12 month interval after surgery. The position of the testis was noted down.

A testis which was good volume and was below the mid-Scrotal point was considered successful outcome. Any testis, which was above the mid-scrotal line, near root of scrotum or pubic tubercular was considered failure of the procedure. Loss of echogenesity of testis on ultrasonography was considered a failure. Absence of testicular tissue feeling on palpation/ ultrasonography was considered atrophic testis. Testicular volume=length cm x breadth cm x height cm. Data was analyzed statistically using SPSS software, data were presented as mean with SD paired t- test was used for measurement data in each group pre and post. Operatively A 'P' value <0.05 was considered statically significant.

Results

A total of 58 patients were included in this study, group "A" included 28 patients who underwent one-stage SFO, while group "B" included 30 patients who underwent two-stage SFO. This study was conducted between January 2018 and January 2021. The average age group of patients in groups A and B was 2.6 ± 0.47 years and 2.9 ± 0.39 years respectively. The mean preoperative size in groups A and B was 2.2 and 3.8 cm^2, respectively. The post-operation average size in groups A and B was 0.30 and 1.2 cm^3 respectively. The mean duration of follow-up was 19.2 months, range (3-40 months). In groups 'A' and 'B' 20 of 28 patients (71%) and 26 of 30 patients (86%) had testicles located deep in the scrotum *i.e.* a successful outcome according to our study protocol.

This difference was statistically significant ($p<0.05$). In group 'A', there were 8 cases who had an unsuccessful outcome (5 atrophic and 3 could not achieve the desired scrotal position). There were 5 and 2 cases of atrophic testis in group 'A' and 'B' respectively. Among successful cases in group 'A' 'B' 3 and 1 case had migration of testis above the mid-scrotal point respectively. These three testis required refixation of testis *via* a single scrotal incision. The migration of the testis was noted after an average of 3.2 months in both groups. In group "A", there were only four failure cases, 2 atrophy cases and 2 cases that did not reach the desired position in the scrotum. The difference in the successful rates (post op testicular position and salvageablity) was statically significant ($p<0.05$) (Tables 1-3).

Age	Group A	Group B	P valve
Average	2.0 ± 0.47	2.9 ± 0.39	0.67
Right UDT	19	20	0.637
Left UDT	11	10	0.598
P-Value	0.6	0.54	0.562
Total	28	30	

Table 1. Average age between the two groups.

	Group A (single sate)	Group B (Two stage)	P valve
Average size in cm^3	2.2 cm	3.8	0.05
Median cm^3	3.6	4.7	0.576
Minimum cm^3	2 cm	3.9	0.085
Maximum cm	4.9	7.1	0.074

Table 2. Pre-operative USG size of each testis in both groups.

	Group A	Group B	P valve
Mean cm^3	0.3	1.2	0.046
Median cm^3	0.98	1.05	0.032
Minimum	0.2	1.3	0.043

Table3. Post-operative increase in size on USG for successful repair.

Discussion

Impalpable UDT constitute more than 8% of all instances of cryptorchidism. Laparoscopy is the standard tool to diagnose the position of the testis from DIR, vessels of testis and vas. SFO was reported in 1956 and achieved good clinical outcome [2]. The work of fowler and stephens suggested that in addition to spermatic vessels, the testicular blood supply also comes partially from vas difference vessels, gubernaculum vessels, collateral vessels from cremastric fibers, and IEV. This included the division of the testicular vessels in the first stage and orchidopexy in the second stage after the testis develop collateral circulation *via* the vessels to vas and gubernaculum. It can be performed either in one stage or in two stages. Most of the authors perform two stages SFO. There has been always controversial reports at to which of these two procedures are more successful [3]. In our study the overall success rate in two stages SFO was significantly more than single stage repair.

In single stage repair our success rate was (71%) 20/28 patients. Horasanli et al. reported 87.5% success rate in single stage SFO operation, which was more than our success rate [4]. Authors like Xinhvi et al. and Ali Slimane et al. claim higher, (100%) success rate of single stage SFO [5]. However there are few reports with an opposing view like Docimo et al. [6], who reported 66.7% success rate in single stage SFO Chary et al. [7] and Robertson et al. [8] determined the efficacy of two stage SFO operation to be significantly better than a single stage SFO. These Authors had a successful rate (90% of staged SFO similar to our success rate 86% our study). Furthermore the testis Salvage ability rate was also higher in two stage operation than single stage operation. In a study by Radmayr et al. the success rate for primary laparoscopy assisted orchidopexy is 88%, which is slightly lower to that in the literature ranging from 97% to 100% [9].

In contrast, the overall success rate for laparoscopic staged SFO procedure is 63%, which is slightly lower to that in the literature (ranging from 76% to 93%) [10]. We believe the laparoscopic approach is definitely better for performing SFO, but staged SFO is better than single stage SFO, though with an obvious drawback of requiring a second anesthesia/surgery. In this study, similar groups of patients were compared, who underwent single stage and two stage SFO procedures. The results showed that the staged II SFO achieved good testicular volume and optimal position and decreased atrophic rates. We believe technical aspect of stag II SFO is very critical since the testis has to survive on the vassal vessels. The dissection of the vas and associated vessel has to be very meticulous and optimal. As this is the critical step for operation can jeopardize the vascular supply of testis, which results in testicular atrophy. Prior to selecting a patient for a single-stage SFO, the color of the testicles must be checked after clipping the vessel. The puncture in the testis can also represent the appropriate collateral that can indirectly ensure that the subsequent dissection could be safe for the future outcome of the testis [11].

We performed stage 2nd after 4-6 months as a study protocol. Rosito et al. found histological changes are not caused by clipping the spermatic vessels. Instead 6 month interval between the two stages exposed the testis to prolonged warm ischemia time as suggested by Bianchii et al. Many authors believe that if after clipping the vasal vessel, if surgeon feels the vascular supply of testis is not optimal. It is not appropriate for single stage operation at this stage. This is because a complete collateral circulation will still take some time to become established, so it is not appropriate for dissection of at this stage, as it, may result in post-operative testicular atrophy.

In such instances a performed in series operation should be done in two stages. We presume of recently been introduction. Surgeons must always be wary of the risk of atrophy or undesirable position of the testicles with a one-step operation. Single stage SFO should not egoistically be carried out as the outcome could be unsatisfactory and it can be lead to testicular atrophy, as demonstrated in our study. A complete understanding of anatomy and meticulous dissection and on table decision of completing a surgery or leaving the orchidopexy for the second stage is the critical steps in SFO.

Conclusion

In conclusion, the management of impalpable UDT should be the initial diagnostic lap and followed by either single or two stages SFO is now the standard of care. Single-stage SFO is now presented as being more popular because consecutive series did not show any significant differences observed between children who underwent single or two stages SFO. We recommend proper examination of the anatomy and all the tissues *i.e.* testis, vas vessel and looking for color of the testis after clipping the testis. All though one stage SFO has obvious advantages of improved convenience for parents and avoiding second hospitalization. We believe it should be performed whenever feasible.

References

1. Ali N, Gökhan BB, Cankat E, et al. Laparoscopic one-stage fowler-stephens orchiopexy preserving gubernaculum. Turk J Urol 2017; 43(1): 75-8. [Crossref] [Google Scholar] [Indexed]
2. https://link.springer.com/article/10.1007/BF00326700
3. Horasanli K, Miroglu C, Tanriverdi O, et al. Single stage fowler-stephens orchidopexy: A preferred alternative in the treatment of nonpalpable testes. Pediatr Surg Int 2006; 22: 759-761. [Crossref] [Google Scholar] [Indexed]

4. https://www.unboundmedicine.com/medline/citation/15098752/[Impalpable_testis:_value_of_one_stage_surgical_descent]_
5. Docimo SG. The results of surgical therapy for cryptorchidism: A literature review and analysis. J Uro1 1995; 154(3): 1148-1152. [Crossref] [Google Scholar] [Indexed]
6. Chang B, Palmer LS, Franeo I. Laparoscopic orchidopexy: A review of a large clinical series. BJU Int 2001; 87(6): 490-493. [Crossref] [Google Scholar] [Indexed]
7. Robertson SA, Munro FD, Mackinlay GA. Two-stage Fowler-Stephens orchiopexy preserving the gubernacular vessels and a purely laparoscopic second stage. J Laparoendosc Adv Surg Tech 2007; 17(1): 101-8. [Crossref] [Google Scholar] [Indexed]
8. Radmayr C, Oswald J, Schwentner C, et al. Long-term outcome of laparoscopically managed nonpalpable testes. J Urol 2003; 170: 2409-11. [Crossref] [Google Scholar] [Indexed]
9. Baker LA, Docimo SG, Surer I, et al. A multi-institutional analysis of laparoscopic orchidopexy. BJU Int 2001; 87(6): 484-9. [Crossref] [Google Scholar] [Indexed]
10. Rosito NC, Koff WJ, Silva OTL, et al. Volumetric and histo-logical findings in intra-abdominal testes before and after division of spermatic vessels. J Urol 2004; 171: 2430–2433. [Crossref] [Google Scholar] [Indexed]
11. Bianchi A. Microvascular transaction of the testis. (5th edn): Pediatric surgery London, Chapman and Hall Medical. 1995, pp726–733.

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