

Orchidopexy with and without Sac Ligation in Pediatric Patients with Palpable Testes

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ABSTRACT

Objective: To compare mean operative time with and without sac ligation and incidence of post-operative hernia in pediatric patients with palpable testes undergoing orchidopexy.

Study design: Prospective Comparative study

Duration and place of study: Pediatric surgery department Children's Hospital and Institute of Child Health Lahore, Khairpur Medical College Civil Hospital Khairpur and Ghulam Muhammad Mahar Medical College Civil Hospital Sukkur from January 2015 to July 2020.

Methodology: A total of hundred patients were selected for this study and were divided in two equal groups. Group I included cases in which orchidopexy was carried out without dissection and ligation of peritoneal sac, while group II included patients in which sac ligation was performed. Mean operative time was recorded for each case. Post-operative follow ups were carried out at one, four, eight and twelve weeks. Patients were examined for post-operative hernia at each follow up and results were noted.

Results: The mean age of the patients was observed as 4.05±1.73 years. The study results showed that 60 (60%) patients had left incompletely descended palpable testes whereas 40 (40%) patients had right UDT. The study results showed that the mean operative time of the patients was noted as 22±7.11 minutes. The mean operative time of the patients from no sac ligation group was 21.25±0.90 minutes whereas in ligation group 33.10±1.10 minutes. Statically, two groups showed a highly significant difference with p-value 0.001. Post-operative hernia was not seen in any of the patients from either group.

Conclusion: It was concluded in our study that orchidopexy without sac ligation consumes less operative time and carries no risk of post-operative hernia.

Keywords: Cryptorchidism, Operative time, Post-operative hernia, Sac ligation Undescended testicle.

INTRODUCTION

The cryptorchidism is a translation of a Greek term meaning obscure or hidden testis. It is one of the most common abnormalities of male sexual development¹⁻². Orchidopexy is likely to be successful in children when the undescended testis is relatively close to the scrotum. An undescended testicle is not common in general, but quite common among the males born prematurely³. Recent evidence suggests that ligation of sac in orchidopexy is not only unnecessary but consumes lot of time and also results increased severity in post-operative pain.

The undescended testis can be retractile, incompletely descended, ectopic and atrophic or completely absent. During 6th week of gestation, testes begin to form at germinal ridge close to the kidney in the retroperitoneum, by 28 weeks' gestation due to the differential growth of the fetus, the testicles begin their descent and reach scrotum by 40 weeks' gestation. Normal descent is pre requisite for normal spermatogenesis⁴.

In case of UDT 80% cases; the testes are palpable within inguinal canal while in 20% cases they are impalpable. Spontaneous descent of testes after 09 months of age is very unlikely, therefore fixation of testes within scrotum is recommended before age of one year to prevent the risk of infertility due to impaired germ cell production at

high supra-scrotal temperature, to prevent testicular torsion, and to decrease the risk of seminoma associated with undescended testes⁵.

The mainstay of treatment is surgery. When testes are impalpable or abdominal, laparoscopic surgery is recommended as both diagnostic and therapeutic procedure⁶. Laparoscopic orchidopexy can either be done through the traditional or the newly introduced single incision multiport approach or the single or two-stage Fowler-Stephens techniques, as there are no significant differences between the two procedures with regard to size, position, blood supply, or atrophy rate of the testes but for the palpable inguinal testes, the debate continues to exist about the surgical approach, and technique⁷⁻⁸.

Some authors favor the time tested traditional inguinal incision, while others recommend Bianchi single high scrotal incision for the primary palpable undescended, gliding, or trapped testes. Ligation of sac in inguinal hernia surgery is unnecessary and time consuming⁹. Furthermore, it has been reported that orchidopexies without ligation of sac, save intraoperative time, are simple safe and effective.

Aim of this study is to compare the mean operative time with and without sac ligation and incidence of post-operative hernia in pediatric patients with palpable testes undergoing orchidopexy.

METHODOLOGY

This prospective comparative study was conducted at Pediatric surgery department Children’s Hospital and Institute of Child Health Lahore, Khairpur Medical College Civil Hospital Khairpur and Ghulam Muhammad Mahar Medical College Civil Hospital Sukkur from January 2015 to July 2020.

A total of 100 patients were recruited for this study and were divided in two equal groups. Patients were selected following non-probability purposive sampling technique. Sample size was calculated with 95% confidence level, 80% power of test and taking magnitude of mean operative time i.e. 16.45±7.0 minutes during orchidopexy without sac ligation and 30.0±7.0 minutes during orchidopexy with sac ligation in patients with UDT¹⁰⁻¹¹. Patients of age less than 12 years with palpable undescended testes, scheduled for single stage orchidopexy were included in study. Patients with impalpable testes, patients undergoing staged or laparoscopic technique, patients with history of orchidopexy, patients with ambiguous genitalia, patients with co-morbidities like neural tube defects, cardiac anomalies, storage disease and patients with pre-operative hernia were excluded from this study.

Written consent was taken from parents/guardians who were willing to participate in this study. Demographic information including name, age, gender, and contact number was noted on specially designed proforma. A computer generated table of random numbers was used to randomly divide the selected patients in two groups. Group I included cases in which orchidopexy was carried out without dissection and ligation of peritoneal sac, while group II included patients in which sac ligation was performed. All the surgeries were performed by researcher himself under general anesthesia. Mean operative time was recorded for each case. Operative time was defined as the time from incision till the close of the skin excluding the induction and recovery time of anesthesia. Operative time was noted on the proforma for each patient. Post-operative follow ups were carried out at one, four, eight and twelve weeks. Patients were examined for post-operative hernia at each follow up and results were noted.

The Statistical Package for Social Sciences (SPSS) software version 24 was used to analyze the data. Descriptive statistics were used to calculate mean and standard deviation for numerical variables like age and operative time. Frequency and percentage was calculated for qualitative variables like gender, side and post-operative hernia. Operative times were compared in two groups using independent samples t-test considering p-value ≤ 0.05 as significant.

RESULTS

In our study, a total 100 patients were recruited. The mean and standard deviation of age of the patients was noted as 4.05±1.73 years. Age range of the selected patients was from two to seven years. The mean age of patients in group I was 4.10±1.51 years while mean age of patients in group II was 4.00±1.94 years.

The study results showed that 60 (60%) patients had left incompletely descended palpable testes whereas 40 (40%) patients had right incompletely descended palpable

testes. Out of 60 left incompletely descended palpable testes, 20 (40%) were randomized to no sac ligation treatment method while 40 (80%) were randomized to sac ligation group. Out of 40 right incompletely descended testes, 30 (60%) were randomized to no sac ligation treatment method while 10 (20%) were randomized to sac ligation group as shown in Table 1.

Table 1. Descriptive statistics of patients for side of UDT according to study groups

		Study Groups		Total
		No sac Ligation	Ligation	
Anatomical Side	Left	20 (40%)	40 (80%)	60 (60%)
	Right	30 (60%)	10 (20%)	40 (40%)
	Total	50 (100%)	50 (100%)	100 (100%)

In this study the mean operative time of the patients from no sac ligation group was noted as 21.25±0.90 minutes whereas the mean operative time in ligation group was noted as 33.10±1.10 minutes. Statically, two groups showed a highly significant difference with p-value 0.001. Post-operative hernia was not seen in any patient from either group. Detailed comparison is shown in table 2.

Table 2. Comparison of mean operative time and post-operative hernia

		Group I	Group II	P value
Mean Operative time (Minutes)	N	50	50	0.001
	Mean ± SD	21.25±0.90	33.10±1.10	
Post-operative hernia	No	50	50	--
	Yes	00	00	

DISCUSSION

During normal fetal development, testes develop in the abdominal cavity and then they gradually descend through the inguinal canal into the scrotum during the last two months of intrauterine life. Sometimes this process is either delayed or never initiated and results in cryptorchidism¹². There are various types of cryptorchidism which include retractile testis, testicular agenesis, ascending testis syndrome, testicular mal-descent¹³. Definitive treatment of this condition is timely surgery. A general consensus has been reached regarding at what age the corrective surgery should be carried out. Early detection and treatment by six to twelve months of age is of utmost importance to reduce the risk of loss of germ cells and improve the fertility index of the patient¹⁴⁻¹⁵.

The traditional conventional technique is well accepted and widely followed. It recommends that the hernia sac should be ligated to prevent post-operative complication of hernia. However, it was observed with laparoscopic orchidopexy technique that there is no significant difference between simple suturing when the peritoneum is incised, the hernial sac is dissected and left alone. One possible explanation for this phenomenon could be that metamorphosis of in situ mesodermal cells close the peritoneal defect within twenty-four hours post-operatively. Veena Kumari et al. study reports the results on

non-ligation of the hernial sac during conventional orchidopexy¹⁶.

Our study was done in Department of Pediatric Surgery, Pediatric surgery department Children's Hospital and Institute of Child Health Lahore, Khairpur Medical college Civil Hospital Khairpur, and Ghulam Muhammad Mahar Medical College Civil Hospital Sukkur from January 2015 to July 2020, to compare the incidence of post-operative hernia and mean operative time with and without sac ligation in pediatric patients undergoing orchidopexy.

In our study we found out that orchidopexy done without sac ligation technique consumes less operative time. Shirazi M et al.¹⁷ conducted a retrospective study on two techniques conducted at their institute over past ten years. They concluded that sac ligation technique was more time consuming and without any significant benefits of post-operative complications. Similarly, a study conducted by Amanollahi et al.¹⁸ concluded that non sac ligation technique does not raise the risk of post-operative hernia and could prove to be better alternative to classical technique. Similar results were observed in a study conducted by Maitra SK et al.¹⁹.

Contradictory results were observed in a study conducted by Sonmez K et al.²⁰, they concluded that high sac ligation is mandatory as it prevents the complication of post-operative inguinal hernia.

CONCLUSION

It was concluded in our study that orchidopexy without sac ligation consumes less operative time and carries no risk of post-operative hernia.

Conflict of Interest: Author declares no conflict of interest.

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