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Comparison of high scortal incision with standard inguinal incision orchidopexy in infants and children with palpable undescended testis.

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ABSTRACT… Objective: To compare high scortal incision with standard inguinal incision orchidopexy in infants and children with palpable undescended testis. **Study Design:** Randomized Controlled Trial. **Setting:** Department of Pediatric Surgery, Allied Hospital Faisalabad. **Period:** 17-10-2020 to 16-10-2021. **Methods:** Two groups were randomly assigned to children diagnosed with perceptible UDT, aged 9 to 18 months. In group A, orchidopexy was performed through a high scrotal incision, in group B, standard two-incision inguinoscrotal procedure was used. Length of surgery, hospital stay, scrotal hematoma, wound infection, testicles atrophy, secondary ascent variables were used to compare groups. **Results:** Average age in Group B= 12.18±2.59 months; Group A=12.66±2.71 months. 51% had undescended testicles on right side, 49% had them on left. Whereas 58% children had canalicular appearance, 42% showed testes at external ring. Mean operating times in Group A= 27.26 ± 3.93 min and Group B= 34.72±3.25 min. Mean hospital stays in group A =1.10 ± 0.30 minutes; group B= 1.40±0.49 minutes. 4% in group A and 16% in group B had scrotal haematoma. 6% in group A and 14% in group B acquired wound infections. 4.0% in group A and 6.0% in group B experienced secondary ascent. **Conclusion:** Scrotal incision strategy is preferable to inguinal incision method for palpable UDT treatment.

Key words: Cryptorchidism, Orchidopexy.

INTRODUCTION

Undescended testes (UDTs), also known as cryptorchidism, affect between 1% to 4.6% boys compared to other congenital disorders affecting male newborns.[2,3] Infertility, cancer of the testicles, torsion of the testicles, and other diseases are all known to be independently associated with cryptorchidism.[4] Early on correction of the UDT is essential to prevent later testicular deterioration. Fortunately, around 80% of the UDT are palpable at either internal or external inguinal ring, or even higher scrotal canal.[4,5]

As a developmental abnormality, an undescended testis can affect anywhere from 2% to 4% of infants to around 1% of children beyond the first year of life.[5] Numerous deformities of the abdominal wall, gubernaculums, epididymal abnormalities, inadequate activation of gonadotropin hormones, and the mother's administration of exogenous estrogen are all risk factors, however the precise cause of the condition is unclear. The vast majority of cases involving undescended testes occur within the first few months of a baby's life, with only a small percentage occurring throughout the subsequent nine months.[5]

One alternative for therapy is the use of exogenous hormones, which have a therapeutic response rate of around 30%. In many circumstances, the only way to increase fertility is to undergo surgery.[6] The inguinal procedure is considered the typical surgical intervention for undescended testicles, and it includes two incisions: an inguinal incision to reach the inguinal canal; scrotal incision to conduct orchidopexy.[7] Inguinal incision should be performed for greater exposure and mobility of the spermatic cord and hernia sac, as well as aiding high sac ligation to give sufficient length for placement and stabilization of the testis in the

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scrotum.[8,9] Bianchi and Squire established the high scrotal incision technique in 1989 as a unique means to minimize the complications associated with the standard inguinal approach.[1,10] Scrotal orchidopexy may not be enough to provide enough spermatic cord length for a high testicular position, according to some studies, while others assert that it does not permit sufficient high ligation of the patent processus vaginalis to prevent inguinal hernia.[11] In children with palpable undescended testes, a study compared the risks and efficacy of single incision transscrotal orchidopexy to standard inguinal orchidopexy. Every category contained 134 instances. Group A had an average operation time of 28.32±0.92 minutes and group B's average operation time was 47.83±0.76 minutes.[12]

The superiority of the conventional inguinal technique vs the high scrotal incision method in the therapy of undescended testicles in babies remains uncertain. In order to determine which is preferable for babies and children with palpable undescended testicles, the present study compared the traditional inguinal technique versus the high scrotal incision strategy for performing orchidopexy.

METHODS

Department of Paediatric Surgery in Allied Hospital Faisalabad undertook this randomized controlled study from 17-10-2020 to 16-10-2021. Both the institution's ethics committee (vide letter No. 1073 dated17-10-2020) and the parents' informed consent processes were successful in approving the study.

Open-epi sample size calculator was used to determine the sample size of 100 patients at a 95% confidence interval, 80% test power, and mean hospital stay of 1.027±0.21 days for orchidopexy and 3.023±0.203 days for conventional method. The research included all patients with palpable UDT and age of 9 and 18 months. The study excluded patients suspected of having sex differentiation abnormalities, ectopic and retractile testes, whose parents refused to participate and those who were lost during follow-up. Using the lottery approach, all kids were divided into two equal groups. One modest scrotal incision was used to conduct orchidopexy on group A. To view the testis, the scrotum was opened and retracted. The testes and spermatic cord were prepared for migration into the scrotum by dividing and ligating the patent processus vaginalis. Group B underwent the traditional two-incision inguinoscrotal technique, which involved opening the inguinal canal, mobilizing the testes and spermatic cord, and then transporting them into the scrotum following a herniotomy.

Surgical Management of Patients in Group A

We exposed the scrotum's subcutaneous tissues and skin with surgical incision that is made in superolateral scrotal margin, then separated the fascia to expose and deliver the testis through the wound. The cremaster muscle was incised and the vas and vessels were preserved. We high-ligated the hernia sac/ processus vaginalis after separating it from the spermatic cord till the level of deep ring. After attaining adequate length, an extradartos pouch was created through the same incision and the testis was placed in it and fixed using absorbable suture. Lastly the dartos fascia and skin were restored.

Treatment for Surgical Procedures in Group B

Patients who had treatment utilizing the traditional inguinal approach had two skin incisions. We could observe the structures of the spermatic

cord through the inguinal canal, which was accessible through the first incision, that was created in the groin. To place the testis in the scrotum, we separated and tied the high hernia sac. Using absorbable suture, we fastened the testis within the dartos pouch that was created by a scrotal incision. Lastly, the skin and dartos fascia were restored. We measured the duration of the operation and any consequences, such as wound infection, scrotal hematoma, testicular ascent or testicular atrophy for both groups of patients. The size of the testicles was determined by means of ultrasonography. Operative time and postoperative wound infection are the primary surgical outcomes, whereas scrotal hematoma, testicular ascent, hospital stay and testicular atrophy are the secondary outcomes. In order to detect recurrence, complications, and testicular location and size, we monitored all patients for two weeks, three months, six months, and a year following release from the hospital. In order to gauge parental happiness with the cosmetic outcomes of their child's operation, we polled them on the subject.

Statistical analysis was conducted using SPSS version 17.0.

RESULTS

The mean age of the children was 12.42+2.65 months (12.66±2.71 months in group A and 12.18±2.59 months in group B). Fifty-one children (51%) had a right-sided palpable undescended testis, and forty-nine children (49%) had a left-sided undescended testis. According to side, no difference was noted in both groups (p 0.345). According to location, 42 (42%) children presented with external ring and 58(58%) children presented with canalicular location. There was not any significant distinction between the two groups, per side (p 0.272).

Both groups had significantly different mean operating times: 27.26 ± 3.93 min for group A and 34.72±3.25 min for group B ($p < 0.0000$). Groups A and B had significantly different mean hospital stays, with group A measuring 1.10 ± 0.30 minutes and group B 1.40±0.49 minutes ($p < 0.0000$). The incidence of scrotal hematoma increased from 4% in group A to 16% in group B, a statistically significant increase ($p = 0.046$). The three cases of wound infection in group A (6%) and seven cases in group B (14%), all of which were not statistically significant ($p = 0.159$), Plus, three patients (6.0%) in group B and two (4.0%) in group A had secondary ascent as indicated in Table-II.

DISCUSSION

When the testis is unable to descend to the scrotal level without putting excessive strain on the spermatic cord, this condition is known as cryptorchidism or undescended testis. Between six months and a year is the right time for orchidopexy.[13] Over time, there has been little change in the way of UDT care. To place the testis in a dependent sub-dartos pouch without inducing excessive tension, it requires a high ligation of the vaginal process, a secondary incision in the scrotum, and a surgical incision in the groin to reach the spermatic cord structures. This procedure is still being used, but with variable degrees of alterations.

		Group		Total	P-Value
		A	B		
Mean Age		12.66±2.71	12.18±2.59	12.42+2.65	0.097
Age Groups (months)	≤10	38(76.0%)	35(70.0%)	73(73%)	0.558
	11-15	11(22.0%)	12(24.0%)	23(23%)	
	>15	1(2.0%)	3(6.0%)	4(4%)	
Side	Right	24(48.0%)	27(54.0%)	51(51.0%)	0.345
	Left	26(52.0%)	23(46.0%)	49(49.0%)	
Location	External ring	23(46%)	19(38%)	42(42%)	0.272
	Canalicular	27(54%)	31(62%)	58(58%)	
Total		50(100%)	50(100%)	100(100%)	

Table-I. Participant baseline characteristics

		Group		P-Value
		A	B	
Operative Time (Minutes)		27.26±3.93	34.72±3.25	0.000
Hospital Stay (Days)		1.10±0.30	1.40±0.49	0.000
Scrotal hematoma	Yes	2(4.0%)	8(16.0%)	0.046
	No	48(96%)	42(84%)	
Wound Infection	Yes	3(6.0%)	7(14.0%)	0.159
	No	47(94.0%)	43(86.0%)	
Testicular atrophy	Yes	2(4.0%)	4(8.0%)	0.339
	No	48(96.0%)	46(92.0%)	
Secondary ascent	Yes	2(4.0%)	3(6.0%)	0.500
	No	48(96%)	47(94.0%)	
Total		50(100%)	50(100%)	

Table-II. Comparison of efficacy and complications in two groups

One of these adjustments is the retroperitoneal mobilization of the testicular vasculature, which provides for a new and more direct path towards the scrotum, which in turn allows for further testicular descent.[14]

This research examined the effectiveness and side effects of a single low trans scrotal incision against a typical two-incision inguinal orchidopexy in children whose testes were palpable but undescended. We included one hundred children who had testicles that had not yet descended. Mean age was 12.42+2.65 months. There were 51 children (51% of the total) with palpable undescended testicles on the right side and 49 children (49% of the total) with palpable undescended testicles on the left side at the time of presentation. According to the side, there was no discernible difference between the two groups (p 0.345). The findings of this study are consistent with those of other researches. The mean age of children in group A was 3.444 ± 2.2177, whereas the mean age of children in group B was 3.455 ± 2.2315 (p 0.967). The operation time in single scrotal incision group was 28.32 ± 0.92 and inguinal group was 47.83 ± 0.76 minutes. This study was conducted in Pakistan).[12] This decrease time requirement is in line with our results.

The percentage of children who presented with an exterior ring was 42 (22%), whereas the percentage of children who presented with a canalicular ring was 58 (58%). During the course of our research, we found that 59.77% of infants presented with UDT on the right side, whereas 40.23 percent of children presented with an undescended testis on the left side.[15] A comparable predominance of side of undescended testis was also discovered by Al-Mandil et al. in the youngsters who participated in their study. According to the researcher, there was no noticeable difference between the two groups (p 0.272), which is in line with the findings of other studies.[16]

The average operational time for groups A and B was 27.26 ± 3.93 minutes and 34.72 ± 3.25 minutes, respectively ($p < 0.0000$). The average hospital stay for groups A and B was 1.10 ± 0.30 minutes and 1.40 ± 0.49 minutes, respectively ($p < 0.0000$). Eight (16%) children in group B and two (4%) in group A developed scrotal hematomas showing a statistically significant difference ($p = 0.046$). Group B had seven (14% of the total) patients with wound infections, whereas group A had three (6% of the total), and there was no statistically significant difference between the two groups ($p = 0.159$). Group B had three cases of secondary ascent, whereas group A had two cases (4.0%). Comparing these to a study where mean operating time in group A was 25.35 ± 3.50 minutes and in group B was 45.45 ± 4.55 minutes ($p < 0.0001$). Group B had ten patients (7.5%) and group A had three (2.3%) scrotal hematomas, with a statistically significant difference ($p = 0.047$). In addition, two patients (1.5%) in group B and four (4.0%) in group A had secondary ascent.[16] Another study found

that the scrotal group had a lower operation time (35.26±5.153) compared to traditional group (52.46±3.86 min) [p<0.001].[17] Scrotal hematoma in another study was lower in scrotal incision only group that is 2.2% as compared to inguinal approach that was 4.4% and this also supports our results (10). One of the most frequent side effects following orchiopexy is postoperative wound infection.[18] In our study, testicular atrophy occurred in 2 (4.0%) of the participants in group A and 4 (8.0%) in group B. A research study found post-operative problems in 16 orchidopexies, including two bilateral issues. Specifically, there were two hydroceles, one inguinal hernia, three atrophies, and six main failures reported.[19] On verbal query parents were contented about single concealed scrotal scar.

Further studies with larger pool and long term follow up may be required to strengthen the results.

CONCLUSION

In conclusion, this study's data show that orchidopexy utilizing the scrotal incision strategy is preferable to the inguinal incision method for palpable UDT treatment.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Samreen Jamil:** Core concept, Manuscript writing.
2	**Sadaqat Ali:** Data analysis & Proof reading.
3	**Imran Qadir:** Manuscript writing.
4	**Ahsan Rehman:** Data acquisition.