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Original Article

Is fixation suture necessary in undescended testicle surgery?

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Abstract

Aim: It is still controversial whether or not testicular fixation is required for undescended testes surgery. In this study, we aimed to compare the results of the patients with undescended testis in a single center, who underwent orchiopexy with or without transfixation suture.

Material and Methods: The medical records of the patients with undescended testes who were operated at our tertiary pediatric surgery department were retrospectively analyzed between July 2015 and November 2018. Patients were divided into two groups as fixation performed (Group 1) and not performed (Group 2). Group 1 included n=30 patients (40 testes) and Group 2 included n=41 patients (49 testes). The age of the patients, type of undescended testis, surgical technique and complication rates were determined

Results: The mean age of the patients was 37.2 (12-104) months in Group 1 and 41.2 (12-110) months in Group 2. In both groups, complications such as recurrence, testicular atrophy, testis torsion, and hernia or hydrocele formation were not observed. One patient in Group 2 developed wound infection, which was recovered with antibiotic treatment.

Conclusion: As a result of the short-term follow-up of our study, there was no clinically significant difference between the two groups. Therefore, we recommend the use of other techniques that do not include parenchymal suture fixation during orchiopexy, and avoiding the routine use of testicular parenchymal sutures if possible.

Keywords: Undescended testis; orchiopexy; fixation.

INTRODUCTION

Undescended testis is a common congenital anomaly in childhood, expressed as one or both of testes not descending into the scrotum (1,2). It occurs in 2-4% of children and this rate decreases to 1% at the end of the first year of life (2). It should be corrected by surgical treatment (orchiopexy), which is known as placing the undescended testicle in the scrotum that corresponds to 0.8% of the full-term new-born males (1-4). The placement of undescended testes in the scrotum was first advocated in 1820, and successful surgical intervention, orchiopexy, was described in 1877 (5-7). Orchiopexy is recommended and performed in order to provide a normal genital appearance, prevent testicular torsion or incarcerated inguinal hernia, increase the fertility rate and reduce the risk of malignancy (1,3,4,7-13). Although experimental studies show that adequate fixation can be achieved with dartos pouch alone, many surgeons opt to use one or more absorbable or non-absorbable sutures through the inside of the tunica albuginea to have a secure fixation (1,3,5,11). Although different techniques have been proposed over the years for the most appropriate fixation, the best method of fixation or whether or not it is required is still controversial (7,10,11,14).

In this study, we aimed to compare the results of the patients with undescended testis in a single center, who underwent orchiopexy with or without transfixation suture.

MATERIAL and METHODS

The study was approved by the Ethics Committee of our hospital and informed consent was obtained from the parents of the patients (17/01/2019-18). The medical

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records of the patients with undescended testes who were operated at our tertiary pediatric surgery department were retrospectively analyzed between July 2015 and November 2018. The age of the patients, type of undescended testis, surgical technique and complications were investigated. The follow-up period and treatment of the patients were conducted by three attending pediatric surgery specialists.

Patients were divided into two groups, as fixation performed (Group 1) and not performed (Group 2). Standard orchiopexy was performed in both groups except for fixation. Group 1 included n=30 patients (40 testes) and Group 2 included n=41 patients (49 testes). The surgical procedures were performed in a day surgery fashion. Non-palpable, retractile, ectopic, recurrent undescended testes (who had second operation between July 2015 and November 2018) or patients who underwent two-stage Fowler-Stephens laparoscopic orchiopexy were not included in the study. In addition, patients lost to follow-up or patients with incomplete medical records including postoperative testicular size and location were also excluded from the study. The patients were evaluated with physical examination during the postoperative course, and the least follow-up period was 9 months. The physical examination findings included localization of the testis, position and consistency, testicular atrophy, testicular torsion and prolonged pain were evaluated.

Standard Surgical Technique

The patients were placed on supine positon under general anesthesia, and surgical area was prepared with 10% povidoniodine solution and patients were covered with sterile surgical drapes. A 3cm long standard inguinal skin-crease incision , a 3-cm-long inguinal incision (above tuberculum pubicum line) was performed The Scarpa and Camper fascias were opened with sharp dissections, and the inguinal canal was exposed and opened along its axis, disrupting the outer inguinal ring. The undescended testis was taken out of the incision and separated from its gubernaculum connections. Cremasteric muscle fibers were separated from the spermatic cord. The patent processus vaginalis or hernia sac was separated from the vas deferens and vascular structures, and high ligation of the sac was performed at the inner ring level with 3/0 absorbable suture (polyglactin). Afterwards, a 2-cm-long transverse ipsilateral incision was made on the scrotum, and sub-dartos pouch was prepared. A tunnel extending along the inguinal canal was created and the testis was descended to the scrotal area with the caution not twisting the spermatic cord. In order to prevent testicular retraction, the tunnel entrance to the scrotum was narrowed with a single 3/0 polyglactin suture. The testicle was placed in the subdartos pouch. At this stage a 3/0 polypropylene or polyglactin fixation suture was placed between the superficial tunica albuginea and inner scrotal wall in Group 2 patients. The scrotal incision was closed with interrupted cuticular 5/0 polyglactin sutures. Following the closure of inguinal canal layers were closed relevant to the anatomic fashion.

Statistical analysis was performed using SPSS 21 (SPSS Inc., Chicago, Illinois, USA) package program . Student's t-test was used to compare continuous variables. A P value <0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 37.2 (12-104) months in Group 1 and 41.2 (12-110) months in Group 2. There was no statistically significant difference between the two groups in terms of age distributions (p> 0.05). The overall mean follow-up period for both groups was 15 months (9-24). The demographic characteristics of the patients in Group 1 and 2 are summarized in (Table 1). In both groups, complications such as recurrence, testicular atrophy, testis torsion, and hernia or hydrocele formation were not observed. In the postoperative follow-up, physical examination findings revealed normal testis position, size and consistency. Chronic pain was not observed in any patient. In addition, no patient had a history of testicular trauma after the operation. Wound infection was observed in only one patient in Group 2, which was recovered after subsequent sulbactam-ampiciline (p.o.) treatment.

Table 2. Tablo 1. The demographic characteristics of the patients in Group 1 and 2

	Group 1			Group 2			P value
	Patient	Testis		Patient	Testis		
Number	n=30	n=40		n=41	n=49		
Age (month)	37.2 (12-104)			41.2 (12-110)			P>0.5
Side	Right n=14 (47%)	Left n=6 (20%)	Bilateral n=10 (33%)	Right n=19 (46.3%)	Left n=13 (31.7%)	Bilateral n=9 (22%)	
Operation time (Minutes)	37 (30-41)			39 (30-45)			P>0.5
Complication	n=0			n=1(2%)			P>0.5

DISCUSSION

Undescended testicle surgery is based on Hunter's published studies at the end of the 18th century, at that time the treatment of undescended testis was castration (15). In 1820, Rosenmerkel was the first to advocate placement of an undescended testicle into the scrotum (7). Then, orchiopexy was first tried by Curling in 1871 (5,15,16). Today, orchiopexy is still performed according

to the principles that Curling described first (5,16). With the widespread use of the antiseptic technique and the first recorded successful orchiopexy performed by Annandale in 1877, this procedure was considered as a suitable option for correction of the testis (5). In 1909, Torek procedure was emerged as a two stage procedure, and had gained a dominant orchiopexy procedure for many years (11). Although, interesting methods such as fixation to the thigh, fixing with rubber band have been tried in time, subdartos pouch fixation technique has been the most preferred method that exists today (5, 7, 11). Petrivalsky reported scrotal pouch technique in 1931, DeNetto and Goldberg reported Dartos pouch technique "without suture" in 1964 (11). In the following periods, after the animal experiment and clinical studies, different modifications were described, avoiding to pass through tunica albuginea. As an alternative to trans-parenchymal suture fixation, an orchiopexy with a modified Dartos pouch was reported by Ritchey and Bloom in 1995 (11). Then, it was suggested to pass sutures from the cremaster or paratesticular tissues without passing any trans-parenchymal fixation sutures from the testes (7). Although surgical approaches to undescended testes are advancing progressively in chronological terms, the optimal surgery is still controversial (3). At least 40 surgical techniques and their modifications are still being used for the treatment of undescended testes (5,7,11,16).

Today, scrotal pouch fixation is still used for undescended testes. Most commonly, a fixation suture passing through the tunica albuginea is used in some major medical centers (5). Fixation sutures, commonly used as part of orchiopexy surgery, have been shown to produce severe histopathological changes such as local necrosis, vascular damage, or a serious inflammatory response that may lead to immunological response (3,5-7). Numerous experimental and clinical studies have indicated how those sutures may endanger normal spermatogenesis depending on how it is done, and negative effects on fertility by breaking up the seminiferous tubules within the testicular parenchyma have been reported (3,5-7,11). It is argued that these sutures could cause deterioration of the blood testicle barrier, resulting in anti-sperm antibody development and accordingly have a potential negative impact on fertility (6,9,11,13,17). It is known that the trans-parenchymal technique provokes the phenomenon known as "sympathetic orchiopathy" (damage to the contralateral testis in case of unilateral testicular damage or ischemia) (7,9,11,18,19). Placement of sutures in the testicles or just in the tunica albuginea has been shown to cause parenchymal damage to the testicle by causing segmental or complete infarction (20-22). Interestingly, one study showed that only mechanical parenchymal transfixation of the suture with no knot causes adequate damage by leading to morphological changes in the testicles (9). In men with history of orchiopexy surgery for undescended testis the fixation sutures are considered to be a strong independent predictor of infertility (3,6). In addition to aforementioned risks, various studies have reported that fixation sutures cannot prevent testicular torsion in certain circumstances even 27 years after orchiopexy testicular torsion was observed (1,3,5,11,13). Numerous clinical and animal experiments have shown that the trans-parenchymal suture causes testicular damage, and the use of sutureless techniques have been advocated due to the concerns described above (3,6,7, 11,13,19-22).

Contrary to these studies, although the trans-parenchymal sutures cause morphological changes, there are few publications that argue that they do not cause significant or permanent damage to sperm parameters and that reporting torsion followed by undescended testes surgery when fixation sutures are not placed. (9, 10). Although many modified sutures have been described, the need for fixation sutures when performing orchiopexy for undescended testis is still controversial.

The aim of our study was to investigate whether there were any differences between the two groups in terms of basic complications such as testicular atrophy and recurrent undescended testis, which are accepted to be dependent on suture and emerged as a result of concerns mentioned above.

Testicular atrophy, which is the most important complication of orchiopexy and is considered to develop after injury to spermatic vessels, was not observed in both groups in our study (12,19,23). In addition, no recurrent undescended testis was observed in both groups. Wound site infection rate was 2% (n=1) in our study, similar to the existing literature (24).

CONCLUSION

It is still controversial whether or not testicular fixation is required for undescended testes surgery. As a result of the short-term follow-up of our study, there was no clinically significant difference between the two groups. Therefore, we recommend the use of other techniques that do not include parenchymal suture during orchiopexy, and avoiding the routine use of testicular parenchymal sutures if possible. The small number of patients, short-term follow-up period and the lack of histopathological examination, and ultrasonography imaging in both groups were the limitation of our study.

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