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Original Article

Our Dartos Pouch Orchiopexy Results Without Transparenchymal Testicular Suture Fixation

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ABSTRACT

Objective: To evaluate the operation results in children with the diagnosis of undescended testis who underwent orchiopexy without fixation of transparanchymal sutures.

Methods: In this study, 347 patients who were operated on for undescended testis between October 2013–January 2020 were retrospectively reviewed. The testis was placed in the dartos pouch and the pouch was narrowed on both sides in patients. Those who underwent surgery with the diagnosis of undescended testis were between the ages of 1 and 15. Transparenchymal suture fixation was not applied in order not to damage testicular parenchymal tissue and adversely affect spermatogenesis. The patients were evaluated in terms of postoperative complications, operation success rate, and recurrence.

Results: 347 patients who underwent orchiopexy by narrowing the dartos pouch without transparenchymal suture fixation were evaluated. In the physcial examination performed in the follow-up of 338 patients, it was observed that the testicles were in the scrotum, and the testicular dimensions were normal in the scrotal ultrasonography performed at the 6th month and 1st year postoperatively. 7 patients underwent reoperation due to recurrence, 2 patients underwent orchiectomy for atrophy.

Conclusion: In some experimental studies, it was found that the suture passing through the testicular parenchyma damage the testicular parenchyma tissue and affect the germ cell development. For this reason, if the testicle descends into the scrotum without tension, and the dartos pouch is narrowed on both sides without recurrence, testicular parenchymal fixation may not be applied because the suture to be passed through the testicular parenchyma may damage this tissue histologivally. Considering the 97.4% success rate in this study, it was seen that successful orchiopexy could be performed without passing through the testicular parenchyma in suitable patients in order not to adversely affect the spermategenesis.

INTRODUCTION

Undescended testis is one of the most common congenital anomalies in boys and is seen in 2–9% of term babies. This rate is reported as 0.8–1.0% in children over the age of 1.[1,2] The testis may descend spontaneously in the first 3–6 months after birth in 35–43% of the cases, but undescended testis has been reported to develop again in 22% of these cases.[3] The incidence of undescended testis is closely related to the week of birth and weight; while this rate is 33% in premature babies, it decreases to 3% in term babies.[4]

In patients with undescended testicles, the testis can be located in the abdominal, inguinal, superficial inguinal, high scrotal pouch, and rarely ectopically. The testis can be palpated in 70% of patients with undescended testicles.[5] In those with non-palpable testicles, 30% were inguinoscrotal, 55% were intra-abdominal, and 15% were vanishing testicles.[6,7]

In more than 70% of the patients, adequate diagnosis can be made by physical examination and no additional imaging technique is required. There is a need for radiological studies, especially in nonpalpable testicles.[8] Ultrasonography (US), computed tomography (CT), or magnetic resonance imaging (MRI) are imaging methods used in diagnosis. US is the most commonly used test in nonpalpable testicles, with 45% sensitivity and 78% specificity.

Orchiopexy, which is the method used in undescended testicular surgery, is among the most common surgical interventions in pediatric surgery and can be performed either open surgery or laparoscopically.[8] Placing the testis into the scrotum; it is important to provide a normal genital appearance, prevent complications such as torsion-inguinal

hernia, preserve fertility, and reduce the risk of malignancy.[8] Orchiopexy achieves its purpose with adequate release of testis and its vessels, adequate scrotal fixation, prevention of the cord and testis torsion, and absence of recurrence. Commonly used methods include classical transfixation orchiopexy, fixation of the testicular wall at two different points and fixation to the dartos fascia, window technique, eversion of the parietal tunica vaginalis, and true dartos pouch orchiopexy. Dartos pouch orchiopexy is also performed by creating an opening in the dartos fascia, passing the testis into the scrotum, and closing both sides of the opening.[9] While applying all these, it should be aimed to achieve these goals with the least trauma to the testicular parenchyma for a normal spermatogenesis.

The aim of this study is to share the results of the patients who underwent dartos pouch orchiopexy.

MATERIALS AND METHODS

The files of 347 patients diagnosed with the undescended testis, who were operated on with the dartos pouch technique between October 2013 and January 2020, were retrospectively analyzed. Orchiopexy was applied to 347 patients who were diagnosed with undescended testicles located distal to the inguinal canal and high in the scrotal location in the physical examination. Patients with ectopic testicular tissue located high at the level of the inner ring of the inguinal canal and operated due to undescended testicular torsion were not included in the study. All patients were evaluated in terms of testicular dimensions and localization by preoperative inguinoscrotal ultrasonography. The patients were prepared according to the surgical procedure. Under general anesthesia, the incision was made in the inguinal region and the skin was passed. Scarpa's fascia is crossed. Testicular tissue was dissected from the gubernaculum and surrounding tissues. High ligation was applied to patients with hernia sac. If the testis could be lowered into the scrotum without tension, the scrotal skin was incised and a dartos pouch was created. The testis was passed through this pouch without torsion of the cord and vessels. The testis was placed in this pouch with the help of forceps. The pouch was narrowed on both sides of the testis with a poliglecaprone suture without disturbing the circulation of the cord and vessels. During this process , no suture fixation was applied from the testicular parenchyma or the tunica albuginea. The incision sites were closed according to the procedure. Postoperative short- and long- term results of the patients were followed up. The results were evaluated in terms of testicular atrophy, recurrence, and success rate, which is one of the late complications.

Ethics committee approval of our hospital was obtained for the study (Decision number: 514/192/4).

RESULTS

347 patients who had testicular tissue distal to the inguinal canal or high scrotal region on physical examination and who could be placed in the dartos pouch without tension during the operation were included in the study. The mean age of 347 patients included in the study was determined as 4.41 (1–15 y). Of 347 patients, 139 (40.1%) had right undescended testicles, 107 (30.8%) left, 101 (29.1%) bilateral undescended testicles. In the follow-up, recurrence was observed in 7 (2%) patients. After the physical examination and scrotal ultrasonography follow-up, the reoperation was performed after an average of 3 months. The cord and vessel lengths of the patients who were re-operated were normal. The cause of the failed orchiopexy was thought to be due to insufficient scrotal pouch formation or insufficient narrowing of the pouch. In the reoperation, fixation was performed by narrowing only the dartos pouch, and the fixation suture passing through the testicular parenchyma was not used. No recurrence or atrophy was detected in the controls.

Testicular atrophy was detected in 2 (0.6%) patients. Preoperative ultrasonography of these patients revealed that the testicular volüme was 25% smaller than the contralateral testis.

DISCUSSION

For a successful orchiopexy, the testis should be placed into the scrotum with minimal trauma. Bevan first suggested orchiopexy for an undescended testis in 1899. Little emphasized adequate mobilization of the testis and its tension-free placement into the scrotum in undescended testicular surgery. The most important complication of orchiopexy is testicular atrophy. Injury of the spermatic vessels, lowering the testis into the scrotum with excessive tension can cause postoperative venous congestion and ischemia, resulting in testicular atrophy. This rate has been reported as 8% in the distal undescended testis and 25% in abdominal testes.[10]

Experimental studies have shown that fixation sutures made from testicular parenchyma or tunica albuginea cause various inflammatory changes in testicular parenchyma.[11,12] These changes are shown histologically as testicular tubular atrophy, tubular necrosis, decreased or absent spermatogenesis.[11,12] In the experimental study conducted on rats by Dixon et al.[12] inflammation was demonstrated histologically in all animal experimental groups, regardless of the size and material of the suture used for testicular fixation. Inflammation was observed in only 5% of the rats in the Dartos pouch control group. In their study, Pul et al.[13] examined the effect of different suture materials passing through the testicular parenchyma and accordingly abscess formation was found to be 72.7% in chromic sutures, 36.3% in nylon sutures, and 18.1% in vicryl sutures. Şencan et al.[14] compared the effects of fibrin glue, silk sutures and polypropylene sutures on testicular parenchyma in testicular fixation in prepubertal rats. It has been shown that the fixation method of the testis to the scrotum with fibrin glue without suture leads to less inflammation and affects less seminiferous tubule structure.

In basic studies on intratesticular artery anatomy, it was stated that testicular parenchymal damage was related to the suture placed in the testis.[15] The suture passing through the tunica albuginea has been shown to damage the subcapsular end arteries.[16]

Surer et al.[17] evaluated the oxidative stress parameters in the testicular fixation model they applied in prepubertal rats. It was determined that the levels of MDA (malondialdehyde) and NO (nitric oxide), which are reactive oxygen products, increased significantly in the contralateral testis with and without suture fixation, and that the levels of superoxide dismutase and glutathione peroxidase from the enzymatic anti-oxidative defense system decreased significantly. They stated that it was related to fixation. In cases where transparenchymal fixation sutures were used, the risk of infertility was found to be 7.6 times higher than the controls.[18]

These studies reported that suturing during testicular fixation may damage the testis and therefore it would be more appropriate to create a dartos pouch without suturing. However, in order to ensure surgical safety, many of the clinicians still continue to put a fixation suture on the testis regardless of the surgical methods they apply.[19,20]

CONCLUSION

In all these experimental studies, it has been shown that the suture passing through the testicular parenchyma causes biochemical and histological damage. If the testis can be lowered into the scrotal pouch without tension, and has sufficient cord and vessel length, adequate fixation can be achieved from the testis parenchyma without suture fixation in order to preserve the testicular parenchyma structure and ensure normal spermatogenesis. In our study, we had a surgical success rate of 97.4% by narrowing the dartos pouch without applying testicular parenchymal fixation. We think that our aim is not only to keep the testis in the scrotum but also to provide a normal spermatogenesis without damaging the histological structure and function of the testis.

Ethics Committee Approval

This study approved by the Kartal Dr. Lutfi Kirdar City Hospital Clinical Research Ethics Committee (Date: 30.12.2020, Decision No: 514/192/4).

Informed Consent

Retrospective study.

Peer-review

Internally peer-reviewed.

Authorship Contributions

Concept: C.Ö.; Design: C.Ö., Y.K.; Supervision: C.Ö., Y.K.; Fundings: C.Ö., Y.K.; Materials: C.Ö.; Data: Y.K.; Analysis: Y.K.; Literature search: C.Ö.; Writing: C.Ö., Y.K.; Critical revision: C.Ö., Y.K.

Conflict of Interest

None declared.

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Transparankimal Testis Sütür Fiksasyonu Yapılmaksızın Dartos Poş Orşiopeksi Sonuçlarımız

Amaç: İnmemiş testis tanısı ile transparankimal sütür fiksasyonu yapılmaksızın orşiopeksi uygulanan çocuklarda operasyon sonuçlarını değerlendirmek.

Gereç ve Yöntem: Bu çalışmada geriye dönük olarak Ekim 2013–Ocak 2020 tarihleri arasında inmemiş testis nedeniyle ameliyat edilen 347 olgu ele alınmıştır. Bir–on beş yaş arası inmemiş testis tanısı ile ameliyata alınan hastalarda testis dartos poşuna yerleştirildi ve poş her iki yanlardan daraltıldı. Testis parankim dokusuna zarar vermemek ve spermatogenezi olumsuz etkilememek amacıyla transparankimal sütür fiksasyonu uygulanmadı. Hastalar ameliyat sonrası komplikasyonlar, ameliyatın başarı oranı ve nüks açısından değerlendirildi.

Bulgular: Transparankimal sütür fiksasyonu uygulanmaksızın dartos poş daraltılarak orşiopeksi uygulanan 347 hasta değerlendirildi. 338 hastanın takibinde testislerin fizik muayene ile skrotumda olduğu, ameliyat sonrası altıncı ayda ve birinci yılında çekilen skrotal ultrasonografide testis boyutlarının normal olduğu görüldü. Yedi hastaya nüks nedeniyle reoperasyon, iki hastaya atrofi nedeniyle orşiektomi uygulandı.

Sonuç: Yapılan bazı deneysel çalışmalarda testis parankiminden geçilen sütürün testis parankim dokusunu zedelediği ve germ hücre gelişimini etkilediği saptamıştır. Bu nedenlerden dolayı testis skrotuma gergin olmayacak şekilde iniyorsa ve dartos poşu testis skrotuma indirildikten sonra her iki yanlardan nüks olmayacak şekilde daraltılıyorsa, testis parankiminden geçilecek sütür bu dokuya histolojik düzeyde zarar verebileceğinden testis parankimal fiksasyon uygulanmayabilir. Bu çalışmada %97.4 gibi başarı oranı göz önünde bulundurulduğunda spermatogenezi olumsuz etkilememek için, uygun hastalarda testis parankiminden geçmeden başarılı bir orşiopeksi yapılabileceği görüldü.

Anahtar Sözcükler: İnmemiş testis; orşiopeksi; sütür fiksasyon.