

Evaluation of Orchidopexy with or without Opening the External Oblique Fascia in Children with Superficial Inguinal Undescended Testis

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Key words

- orchidopexy
- undescended testis
- complication

Abstract

Introduction: Orchidopexy is one of the most common pediatric surgeries. In general, the operation for truly undescended testis (UDT) includes opening of the external oblique fascia. The most common location of the testis in UDT is adjacent to the external inguinal canal (superficial inguinal type). Using a new method we performed orchidopexy without opening the fascia. In this clinical trial we compared the outcome after a classic procedure with that obtained using our method.

Methods and Patients: This clinical controlled trial was undertaken in the Al Zahra hospital between 2008 and 2010. Patients were randomized into either into the closed technique group (group A, n=52) or the open group (group B, n=52). The incidence of short-term and long-term complications was recorded with a specific

questionnaire at the time of surgery and at follow-up visits. Data were analyzed with the SPSS 15.0 software using chi-square and t-tests.

Results: 104 patients were included in this study. The incidence of short-term complications (surgical site hematoma, surgical wound infection, scrotal hematoma) and long-term complications (testicular atrophy) did not differ significantly between the 2 groups. Procedure duration in group A was significantly shorter than in group B ($p=0.001$). Medial thigh sensory loss was more common in group B ($p=0.05$)

Conclusion: When investigating the surgical management of undescended testes, our study found differences in medial thigh sensory loss rate and procedure duration between the open and closed techniques. Operative treatment of UDT without opening the external oblique fascia is highly recommended.

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Bibliography

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Introduction

Truly undescended testicles (UDT), which must be distinguished from retractile and ectopic testes, occur in approximately 4% of newborn males [1,2].

Although most of these testes will descend spontaneously in first months of age, spontaneous descending occurs rarely after 6 months of age [2]. The complications of undescended testicles (malignant degeneration, subfertility, torsion, and inguinal hernia) demand early diagnosis and definitive treatment. Early orchidopexy reduces the risk of torsion, trauma and infertility [2–5]. Conventional operation for UDT performed with opening of external oblique fascia. In this study, we performed orchidopexy without opening of fascia. In this clinical trial we compared outcomes of conventional procedure with our method.

Methods

This study was carried out in one of the largest pediatric surgery hospitals in Iran from June 2008 to April 2010. All procedures were carried out as day-case procedures by one surgeon. To examine the effect of therapeutic interventions, a randomized controlled trial (2 groups: cases and controls) was carried out. To divide the children into groups, children with odd card numbers were allocated to the case group (group A) and those with even numbers were selected as controls (group B). Participants were all children consecutively admitted to the Pediatric Surgery Unit of the study hospital for elective surgery of unilateral UDT. The exclusion criteria were:

- 1) age more than 2 years;
- 2) patients whose parents were disagree to participate in the study
- 3) UDT located in peritoneal cavity or inguinal canal (intraoperatively).
- 4) Retractable testis



Fig. 1 Dissection of spermatic cord from inguinal canal.



Fig. 2 High dissection and suture ligation of the processus vaginalis.

Approval for the study was obtained from the university and hospital ethics committees. Written consent was obtained from the parents after they were told the purposes of the study. The diagnosis was made by inspecting the scrotum while asking the parents to hold child in supine in the frog leg position with both legs free and palpation of the testes in inguinal region. In some cases, we asked parents to take inguinal sonography for documentation. We did not use MRI because this was not necessary to demonstrate a superficial inguinal pouch UDT.



Fig. 3 Orchidopexy through scrotal incision.

Operative Technique

In the control group, children were operated by conventional orchidopexy. In the case group, after induction of general anesthesia, the patient was placed in a supine position. The incision for a routine orchidopexy was performed in the skin crease just lateral and cephalad to the pubic tubercle. The incision was carried down to the external oblique fascia with care to find superficial inguinal pouch or upper scrotum testis. Testis was freed of the gubernacular attachments. The cord was dissected from the floor of the canal (● Fig. 1). The testicle and the spermatic cord, including the spermatic vessels, the vas and the hernia sac were freed up to the level of the internal ring. Then without dividing of aponeurosis of external oblique muscle, a retractor was placed in to the canal and cord structures were dissected free from endopelvic fascia and preperitoneal layers. The internal spermatic fascia was then opened to separate the cord structures within this layer. The hernia sac was found on the medial and anterior surface of the cord and completely dissected free from cord. It was double ligated by PDS 30 (● Fig. 2).

Once adequate length has been achieved, fixation of the testis in the scrotum was accomplished within a subdartos pouch (● Fig. 3) through a second incision on the scrotum. Testis size was determined by using orchidometer.

Patients were followed for 24h, 1-week, and 6 months. On post-operative assessment, the duration of hospitalization and number of postoperative complications (surgical site hematoma, bleeding, scrotal swelling, infection, testicular atrophy, loss of sensation at medial thigh or inguinal region) were collected. Surgical site infections were diagnosed according to the following criteria:

- 1) Infection occurs within 30 days of surgery
- 2) Infection involves only the skin and subcutaneous tissue
- 3) At least one of the following is present:
 - a) Purulent discharge from a superficial infection
 - b) Organisms isolated from aseptically obtained wound culture
- 4) At least one of the following signs of infection is present:
 - a) Pain or tenderness
 - b) Localized swelling
 - c) Redness or heat

Bleeding was defined as symptomatic hemorrhage due to tissue dissection. Surgical site hematoma defined as accumulation of blood beneath the surgical incision need to remove suture(s) for adequate drainage. Loss of sensation diagnosed by detailed neurologic examinations using fine touch test by cotton, and pain sensation by needle done by a pediatric neurologist who was

Table 1 Comparison of case group and control group with regard to demographic baseline and surgery variables (n = 104).

	Cases [n (%)]	Control [n (%)]	p
number of patients	52	52	
age (months)	13.2 ± 4.4	13.6 ± 3.8	NS
surgery time (minutes)	17.83 ± 2.78	22.75 ± 3.48	0.001
anesthesia time (minutes)	56.73 ± 7.32	57.87 ± 8.77	NS

Table 2 Incidence of postoperative complications in the children (n = 104).

	Cases (%) n	Control (%) n	p
surgical site hematoma	1.9% (n = 1)	3.8% (n = 2)	0.5
infection	3.8% (n = 2)	5.8% (n = 3)	0.5
scrotal hematoma	1.9% (n = 1)	–	0.5
medial thigh sensory loss	1.9% (n = 1)	11.5% (n = 6)	0.05
testicular atrophy	1.9% (n = 1)	3.8% (n = 2)	0.18

unaware of allocation of patients. Testicular atrophy was determined by decreased in size of testicles 6 months after surgery (by orchidometer measurement).

All patients were followed for 6 months. We did power analysis in this study. Our power was 0.80 and sample size was sufficient. The Statistical Package for Social Sciences (SPSS) software (version 11.5) was used for data analysis. Data was expressed as mean ± SD for quantitative variables and percentage for qualitative ones. The Mann-Whitney test was used to determine any differences in the mean scores. The relationship between qualitative scores and operative techniques was investigated using 2-tailed t-test and Fisher's exact test. P-values less than 0.05 was considered significant.

Results

104 patients were included in this prospective study. Baseline characteristics of patients included in the study are shown in **Table 1**. The results revealed that the groups were similar with respect to age and duration of conservative treatment. The operation time was 17.83 ± 2.78 in group A, and 22.75 ± 3.48 min in group B (P = 0.001).

The incidence of postoperative complications is shown in **Table 2**. Results indicated that there was a statistically significant difference in postoperative medial thigh sensory loss between the operative techniques; children in group A reported lower sensory loss rates.

Discussion

One of the goals of orchidopexy in humans is to provide adequate scrotal fixation to prevent recurrent torsion of the testis and spermatic cord or ascent of the testis with minimal trauma to the scrotum [2,3]. However, the best method of achieving fixation is in controversy. The methods in common use include Classic transfixation orchidopexy, scarification, the "window" technique, eversion of the parietal tunica vaginalis, and true dartos pouch orchidopexy. The outcome of the experimental study presented here would suggest that the use of the popular technique of surgical fixation of the undescended testicle, involving opening the external oblique fascia should be reconsidered [6].

This trial was conducted in order to establish a simple and safe surgical method for an ideal treatment for undescended testes. Our study showed that frequency of short term as well as long term complications in both closed and open techniques are similar. However duration of surgery among patients underwent closed surgery were significantly (but clinically irrelevant) shorter than open technique.

Management of palpable undescended testis (UDT) traditionally uses an inguinal incision combined with a scrotal incision to fix the testis in the scrotum. Most cases of UDT however lie distal to the external inguinal ring. In 1989, Bianchi and Squire described a new method of orchidopexy named "a single, high trans-scrotal approach" which is becoming more widely accepted as a clinically effective, less invasive method of surgery. The procedure is reported to reduce operative times, is more aesthetically and cosmetically acceptable to parents and children and produces less post-operative pain [7,8]. However there have been concerns over the increased incidence of postoperative herniation and hydrocele formation in cases where the scrotal sac has not been ligated high enough and re-ascent has been reported to occur if proximal scrotal fascia attachments are not dissected and divided [9]. In our method, fascia attachments are released completely and hernia sac is ligated as high as possible by retracting the fascia. Another limitation of Bianchi procedure is that the operation decision is determined by the ability to bring the testis into the scrotum under manual manipulation and tension [10], but this is not necessary for our technique.

In our method for superficial inguinal UDT, external oblique muscle aponeurosis has not been opened, so the possibility of injury to ilioinguinal and genitofemoral nerves is extremely low. The timing of the procedure in our case group is similar to results of Bianchi technique described by Caruso et al. study [9] [17 vs. 15 min respectively].

In summery we conclude that for surgical management of undescended testes, there were differences between medial thigh sensory loss rate and duration of operation between open and closed techniques. Operation of UDT without opening the external oblique fascia is highly recommended.

Conflict of Interest: None

References

- Wagner-Mahler K, Kurzenne JY, Delattre I. Incidence of cryptorchidism at birth: a prospective study at the University Hospital of Nice. *Presse Med* 2010; 39 (9): 981–982
- Sheldon CA. The pediatric genitourinary examination. Inguinal, urethral, and genital diseases. *Pediatr North Am* 2001; 48: 1339
- Ashley RA, Barthold JS, Kolon TF. Cryptorchidism: pathogenesis, diagnosis, treatment and prognosis. *Urol Clin North Am* 2010; 37 (2): 183–193
- Main KM, Skakkeboek NE, Virtanen HE et al. Genital anomalies in boys and the environment. *Best Pract Res Clin Endocrinol Metab* 2010; 24 (2): 279–289
- Shera AH, Baba AA, Gupta SK et al. Undescended testis: How extensive should the work up be? *Afr J Paediatr Surg* 2010; 7 (2): 92–95
- Lotan G, Golan R, Efrati Y et al. An experimental study of the effect of two distinct surgical techniques of orchidopexy on spermatogenesis and testicular damage in cryptorchid testes. *Fertil Steril* 2005; 84 (3): 749–755
- Bassel YS, Scherz HC, Kirsch AJ. Scrotal incision orchidopexy for undescended testes with or without a patent processus vaginalis. *J Urol* 2007; 77: 1516–1518
- Bianchi A, Squire BR. Transscrotal orchidopexy: orchidopexy revised. *Paediatr Surg Int* 1989; 4: 189–192
- Caruso AP, Walsh RA, Wolach JW et al. Single scrotal incision orchidopexy for the palpable undescended testicle. *J Urol* 2000; 164: 156–159
- Samuel D, Izzidien A. Bianchi high scrotal approach revisited. *Pediatr Surg Int* 2008; 24: 741–744