

Comparison of Outcomes of Scrotal and Inguinal Incision Orchiopexy for Undescended Testis

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Abstract

Introduction: The aim of this study was to compare the results of treating undescended testis with conventional inguinal orchiopexy or by scrotal orchiopexy (in selected cases with undescended testis that can be rubbed up to the top of scrotum in their examination under general anesthesia).

Materials and Methods: Physical examination files of 66 palpable undescended testes patients performed by two pediatric surgeons at a 5th level hospital in Kenya/Kiambu within the scope of the program (29/09/2018-07/10/2018) were retrospectively reviewed.

Result: There was a statistically significant difference between the groups in terms of surgery time ($p = 0.001$). In both groups, there was no recurrence, testicular atrophy, and hernia or hydrocele formation complications. Scrotal hematoma was observed in one patient in each group.

Conclusion: Scrotal orchiopexy is a comfortable method that can be preferred in children because it requires less dissection, shorter operative time, no need analgesia, a single scrotal incision, and the fact that inguinal canal is not opened.

Keywords

- Scrotal orchiopexy
- Undescended testes
- Children

Introduction

Undescended testis, one of the congenital anomalies frequently encountered in childhood, is described as the condition in which one or both testes do not descend into the scrotum.^{1,2} It occurs in 2-4% of children and this rate decreases to 1% in the first year of life.^{3,4} The undescended testis is traditionally managed by surgery (orchiopexy), known as relocating the undescended testicle into the scrotum.^{1,2} Surgical intervention is recommended between 6 and 18 months of age where it increases fertility, reduces the risk of tumor development and testicular torsion.^{4,5} It is classified as palpable and non-palpable clinically, and 80% of patients are in the palpable group.¹ Undescended testes can be palpated at various levels of the inguinal canal between the outer inguinal ring and scrotum, most of the testes in this study are palpated in the distal inguinal canal.^{6,7} The standard surgical intervention for orchiopexy was described in 1881-1899.^{8,9} Conventional inguinal orchiopexy is a standard and general accepted approach because the processus vaginalis can be exposed comfortably and high-ligation is possible. In recent years, many surgeons have proposed a scrotal approach, a minimally invasive technique first described by Bianchi and Squire in 1989, to reduce the potential morbidities (inguinal hernia, etc.) of inguinal orchiopexy in order to treat palpable undescended testis.^{1,6,10}

The aim of this study was to compare the results of our patients with conventional inguinal orchiopexy with scrotal orchiopexy performed in certain cases with undescended testis that can be rubbed up to the top of scrotum in their examination under

general anesthesia.

Materials and Methods

Informed consent from the parents of the patients and Ethics Committee approval from our hospital were obtained (03/01/2019-02). Physical examination files of 66 palpable undescended testes patients (Kenya/Kiambu (24 cases), Hitit University Faculty of Medicine Department of Pediatric Surgery (42 cases) (between June 2016 and October 2018), were retrospectively reviewed.

Patients were divided into two groups: single-incision scrotal orchiopexy (Group 1) and standard inguinal orchiopexy (Group 2). Group 1, consisted of n=31 patients (41 testes) whose testes could be palpated and rubbed towards the scrotum in the examination under general anesthesia. Group 2 consisted of n=35 patients (47 testes) whose testes could also be palpated and rubbed towards the scrotum under general anesthesia.

Retractile, ectopic and recurrent undescended testes were not included in the study. The duration of operation was accepted as the time between surgical incision and closure of skin incision. The patients were examined on the 7th, 30th day and third month after the operation.

Scrotal surgical technique

Patients were taken to the operating table in supine position, the surgical area was cleaned with povidone iodine, and after sterile covering, a 2 cm incision was performed in the scrotum and inguinal skin junction of the undescended testicle **Figure1A** Dartos fascia was opened and scrotal dissection was performed on the inguinal

canal, and the testis was delivered through the incision **Figure 1B**. Cremasteric muscle fibers and gubernaculum remnant were separated from the spermatic cord. The patent processus vaginalis/hernia sac was separated from the spermatic cord. The processus vaginalis/hernia sac was dissected until a preperitoneal fat tissue was seen and a high ligation was performed with 3/0 absorbable suture

(polyglactin) **Figure 1C** (Yellow asterix: Hernia sac, blue asterix: Spermatic cord). Subdartos pouch was then prepared with the same incision, and the orchiopexy was performed. Then, the scrotal incision was closed with cuticular 5/0 polyglactin **Figure 1D**. Scrotum fixation was not performed on orchiopexied testicles.

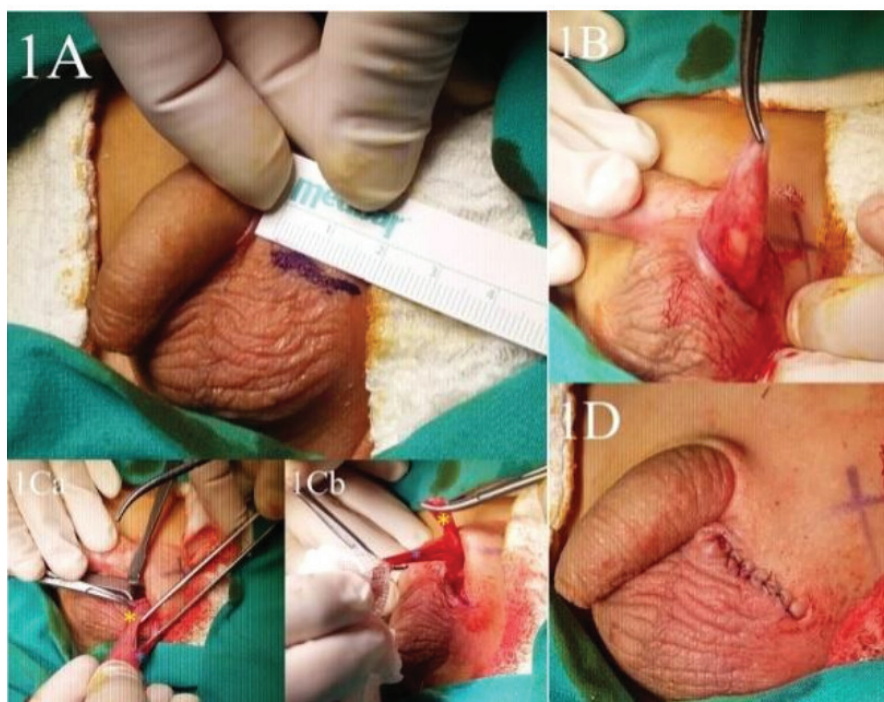


Figure 1A: A 2 cm incision was performed in the scrotum and inguinal skin junction

Figure 1B: Testis was delivered through the incision

Figure 1Ca- 1Cb: The processus vaginalis/hernia sac was dissected until a preperitoneal fat tissue was seen

and a high ligation was performed. (Yellow asterix: Hernia sac)

(Blue asterix: Spermatic cord)

Figure 1D: Scrotal incision was closed

The standard surgical technique

The patients in this group underwent surgery in supine position and the surgical area was cleaned with povidone iodine. After sterile covering, an inguinal incision was made in parallel to the dermis pili 3 cm in length on the side of the undescended testicle. Camper and Scarpa fascia were opened with sharp dissections and the inguinal canal was opened into the outer inguinal ring. The testis was found, taken out of the incision and separated from the gubernaculum connections. The cremasteric muscle fibers were separated from the spermatic cord. The patent processus vaginalis/hernia sac was separated from the cord and its components and ligated with 3/0 absorbable suture (polyglactin) at the internal ring level. Then, a 2 cm long incision was made on the same side of the scrotum, and subdartos pouch was prepared. A tunnel extending to the inguinal canal from this level was created, orchiopexy was performed. The scrotal incision was closed with cuticular 5/0 polyglactin. Then the inguinal canal and other anatomical structures were closed with 3/0 polyglactin. The orchiopexied testis was not fixed to the scrotum.

The operation time, complications of the operation, age, and side of undescended testis were recorded. Statistical analysis was performed with SPSS 21 (SPSS Inc., Chicago, Illinois, USA) package program. Student's t-test was used to compare continuous variables. $P < 0.05$ was considered to be statistically significant.

Results

The mean age of the patients at the time of

operation was 34.8 (12-108) months in Group 1 and 37.2 (12-120) months in Group 2. There was no statistically significant difference between the two groups in terms of age distributions ($p > 0.05$). The mean follow-up period was 12 months (3-24). The demographic characteristics of patients in Group 1 and 2 are summarized in [Table 1](#). Duration of surgery was statistically different between the two groups ($p = 0.001$).

None of the patients that underwent scrotal incision required conversion to conventional surgery. In both groups, there were no recurrence, testicular atrophy, hernia or hydrocele formation complications. Scrotal hematoma was observed in one patient in each group.

Discussion

Traditional orchidopexy is still performed according to the principles by which it was first described.¹¹ However, at least 40 surgical techniques and modifications are currently being used for the treatment of undescended testes.^{11, 12} After the definition of Bianchi et al., in majority of the palpable undescended testes, it was observed that the testes were able to descend into the scrotum easily after dissection of cremaster and processus vaginalis without opening the inguinal canal.^{7, 12} With the description of this method, some authors suggested a scrotal incision with a single incision in selected cases, arguing that this method provided an adequate visibility for undescended testis, contrary to what is believed, and reported the success rate between 89.7% and 98.5%.^{4, 6, 7, 10-16} This approach has also been used recently to treat hernia and hydrocele diseases in selected children.^{11, 12, 17, 18}

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

Group 1			Group 2			P value
Patient		Testis	Patient		Testis	
Number	n=31	n=41	n=35	n=47		
Age (month)	34,8 (12-108)		37,2 (12-120)			P>0,5
Side	Right	Left	Bilateral	Right	Left	Bilateral
	n=16 (52%)	n=5 (16%)	n=10 (32%)	n=15 (43%)	n=8 (23%)	n=12 (34%)
Operation time (minute)	17 (10-25)		39 (30-45)			0,001
Complication	n=1 (2,8%)		n=1 (2,1%)			

In addition, this technique has been recommended even for non-palpable or proximal undescended testes due to shorter operative time, less pain and a better cosmesis.^{7, 16}

In order to perform a scrotal approach, the testis must be palpable and located in the inguinal canal; it should be well mobilized and have a traction when it is rubbed towards the outer inguinal ring and scrotum.^{11, 12, 17, 18} When the testis is not mobile and cannot be brought near the scrotum during the

examination under general anesthesia, we think it is more appropriate to perform a standard inguinal incision instead of a scrotal incision. High and low success rates in the scrotal orchiopexy series may be related to selection bias of those patients. Performing a single scrotal incision instead of two, has some accepted advantages such as better cosmesis, less postoperative pain and less tissue dissection.^{4, 6, 7, 11, 12, 13, 16} However, some authors still find the method controversial, with the concern

that a sufficient cord length cannot be achieved with the scrotal approach and that a sufficiently high ligation cannot be achieved for the patent processus vaginalis.^{6, 7, 11, 13} Despite these concerns, the trend towards using a standard inguinal approach for the treatment of undescended testis has decreased from 65% to 17%, and single scrotal incision approach has increased approximately from 15% to 63%.^{2, 19} Interestingly, a recent study has demonstrated that pediatric urologists perform scrotal orchiopexy significantly more than pediatric surgeons and adult urologists (65.3% vs. 38.6%).²

The reported recurrence rates of the transscrotal approach ranges between 2% and 4.1%.^{7, 18, 20, 21} Complications including hernia and hydrocele have also been reported.^{7, 18, 20, 21} In some studies, both methods were compared, and no significant difference were found in terms of postoperative complications such as wound infection, testicular atrophy, recurrence, hernia and hydrocele.^{2, 6, 7, 20} In our study, except scrotal hematoma, we did not observe any complications in both groups.

The rate of conversion from scrotal orchiopexy to standard method has been reported between 0 and 13%.^{4, 6, 7, 16} The fact that none of our patients required conversion in our study was considered to be associated with patient selection.

Trans scrotal orchiopexy has been shown to be associated with shorter surgery time as compared to standard inguinal orchiopexy.^{6, 7, 18, 20, 21} The operation period was found to be between 18 and 45 min in various studies.^{6, 14} Similar with the literature, there was a significant difference between our two groups in terms of surgery time (mean 17 minutes in Group 1 and 39 minutes in Group 2), in our study.

In addition, compared to traditional inguinal approach, this approach is thought to be more aesthetically appropriate because it is performed with a single incision.^{4, 6, 22} Patients in our group 1, had minimal scarring and parents of all patients stated that they were satisfied with the cosmetic appearance of the testes after the operation (**Figure 2A-B**).



Figure 2A: Postoperative 7th day

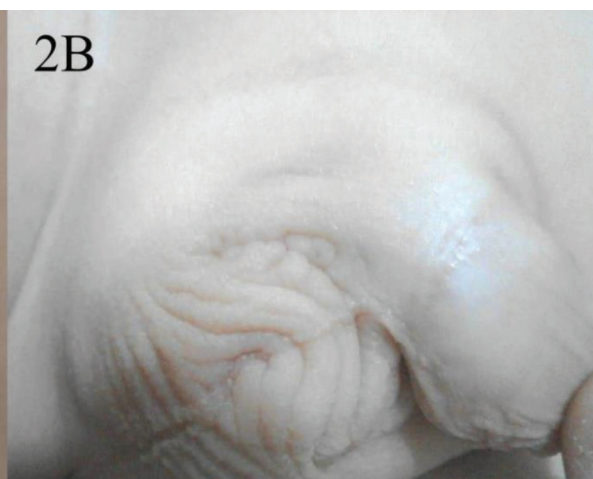


Figure 2B: Postoperative 1st month

Conclusion

Scrotal orchiopexy is a simple and effective surgery with the advantage of shorter surgery time for the treatment of undescended testis in selected cases, particularly for the testes that are mobile, can be palpable in the inguinal canal or in the outer ring, and can extend to the distal end. This is a comfortable method that can be preferred in children because of shorter operative time, no need analgesia, a single scrotal incision, and the fact that inguinal canal is not opened.

Limitations

A small number of patients were included in this study. In addition, significant variables such as testicular volume were not taken into consideration during the follow-up period.

Ethical Consideration

Ethics Committee approval were obtained from Hitit University hospital (03/01/2019-02).

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Conflict of interests

The authors declare that they have no conflict of interest.

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