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Single high scrotal incision orchidopexy for unilateral palpable testis: A randomised controlled study

Almoutaz A. Eltayeb

ABSTRACT

Background: Bianchi and Squire introduced single high trans-scrotal incision for mobilisation of palpable undescended testes to decrease the potential morbidity of the traditional inguinal approach. This incision has not gained widespread acceptance and there is still a considerable debate about its efficacy. This study evaluated the outcome of high single scrotal incision in comparison to the classic inguinal exploration for unilateral palpable testes regardless to its pre-operative location to assure its validity and safety. **Patients and Methods:** This was a randomised controlled study conducted on seventy males with palpable unilateral undescended testicles from November 2009 to October 2013. They were divided into two equal groups; group I had high single scrotal incision and group II had the classic inguinal approach. The comparative parameters between both groups were the operative time, intra-and post-operative complications, post-operative pain and scar. **Results:** There was statistical significant difference between both groups regarding the operative time ($P < 0.001$). The high scrotal approach (Group I) was not completed in three cases and were converted to the classic inguinal approach. No statistical significant difference between both groups regarding the post-operative complications. **Conclusions:** Single high scrotal incision orchidopexy for palpable undescended testis is safe, has shorter operative time but may not be suitable for proximally lying testis.

Key words: Scrotal orchidopexy, palpable undescended testes, single scrotal incision

INTRODUCTION

The classic approach in managing undescended testes (UDT) that involves both inguinal and scrotal incisions to relocate the testes in the dependent scrotal position as described by Schuller and Bevan[1,2] still considered safe by avoiding damage to the testicular vessels and vas and maintain adequate mobilisation of the cord. Bianchi and Squire[3] introduced single high trans-scrotal incision for mobilisation of palpable testes to decrease the potential morbidity of the traditional approach. Although this approach was used also for congenital hernia and hydrocele; it has not gain widespread acceptance and a considerable debate about its efficacy in the literature have been written.[4] Few studies investigate the success of high scrotal incision for palpable UDT regardless its site. The aim of this study is to evaluate the high single scrotal incision in comparison to the classic inguinal exploration for unilateral proximal and distal palpable testes to assure its validity and safety.

PATIENTS AND METHODS

This randomised controlled study was conducted on seventy males presented to Assiut University Children Hospital with palpable unilateral UDT regardless to its site from November 2009 to October 2013. Patients with ectopic, atrophic, retractile, impalpable testes or had previous inguinal surgery were excluded from the study. The patients were randomly divided into two equal groups: (Group I) have their orchidopexy done through the high single scrotal incision and (Group II) have their orchidopexy done through the classic inguinal approach. All patients were examined twice; once at the outpatient clinic and another under general anaesthesia to confirm the site of the testicle and exclude any retractile ones. All cases were given caudal block in addition to general anaesthesia. Informed consent was taken from all patients' parents or guardians to participate in the study and to do either approach. Approval of the ethical committee at faculty of medicine in Assiut University was obtained.

Surgical technique for high scrotal incision

A high scrotal skin incision following that of Bianchi and Squire[3] was done. A sub-dartos pouch was

Department of Pediatric Surgery, Assiut University Children Hospital, Asyut, Egypt

Address for correspondence:
Dr. Almoutaz A. Eltayeb, Department of Pediatric Surgery, Assiut University Children Hospital, Asyut, Egypt.
E-mail: almoutazeltayeb@hotmail.com

developed before starting to dissect through the dartos fascia to reach to the testicle which is held by the assistant's index and thumb. A retractor was inserted while dissection continues towards the external ring if the testicle has not been identified yet. The external ring can be opened if further cord mobilisation is needed. If the testicle is still high up or more length is still needed then conversion to the inguinal exploration is considered necessary. Once the testicle and the cord were dissected a standard orchidopexy steps were followed including separation of the cremasteric muscle fibres and processus vaginalis when present from the vas and vessels giving the length necessary for tension free placement of the testicle into the previously created sub-dartos pouch of scrotum the neck of which is closed by one or two absorbable stitches to prevent re-ascent of the testicle. The scrotal incision is closed by sub-cuticular absorbable sutures [Figures 1-3].

The comparative parameters between both groups were the operative time, intra- and post-operative complications, post-operative pain and scar and success of the procedure. Any post-operative hernia, hydrocele or recurrence (re-ascent of the testicle) from either group will be recorded.

The first follow-up visits will be after 2 weeks post-operatively then every 3 months thereafter.

Statistical analysis

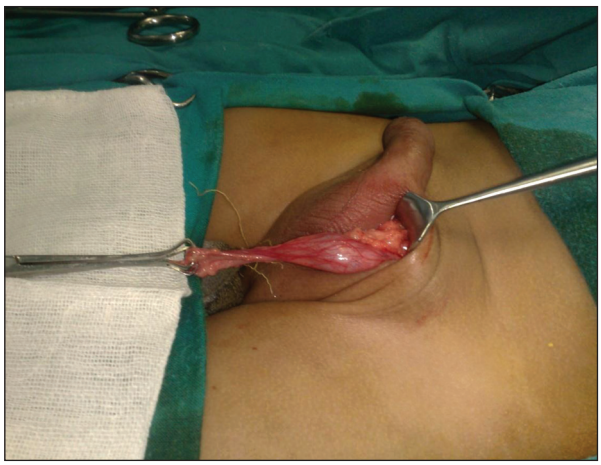
The data were analysed using SPSS® (version 16; SPSS Chicago, Illinois) descriptive statistics (i.e., mean, standard deviation (SD) and percentage) were calculated. Comparative analysis was carried out using Student's *t*-test and Fisher's exact test to compare between groups. The difference was considered as significant if the $P < 0.05$.

RESULTS

Seventy males with unilateral palpable UDT (46 right and 24 left) were included in this study. Their age ranged from 10 months to 6 years and their final testicular position when examined under anaesthesia was as shown in [Table 1] They were randomly assigned to either high single scrotal incision orchidopexy (Group I = 35 cases) Figures 1-3 or the classic inguinal approach (Group II = 35 cases). The difference between both groups was not statistically significant regarding their age and testicular position. 46 cases out of 70 had patent processus vaginalis (PPV) without statistical significant difference between both groups. This PPV was dissected out of the cord structures and ligated.



Figure 1: Mobilization of the right testes through high scrotal incision



Figures 2: Mobilization of the left testes through high scrotal incision



Figure 3: Final wound closure

The mean operative time for Groups I and II was 18.12 ± 4.21 and 25.58 ± 6.47 min, respectively ($P = 0.001$, Student *t*-test). The procedure was not completed through the high scrotal incision in 3 out of 35 cases (all had proximal UDT); the decision was to convert to the inguinal approach to gain more length. Their mean

operative time was 27 min SD ± 1.64. All these three cases and the 35 of Group II had their testicles in the scrotum at the end of the procedure.

All patients tolerated both approaches and no post-operative potent-analgesics were needed in any patient from both groups. The early post-operative complications [Table 2] were wound haematoma occurred in two cases from Group I that resolved spontaneously.

On the first out-patient visit all patients had their mobilized testicles in the scrotum with the same size compared with the contra lateral one. There was no scar scale done to evaluate the final scar but scrotal incision was nearly visible and much appreciated by the parents. The total duration of the follow-up period ranged from 3 months to 1 year where one case from Group I had atrophy and three cases had re-ascent of the testicle two from Group I and one from Group II and scheduled for redo surgery [Table 2]. There was no post-operative hernia or hydrocele in any case during the follow-up period.

Table 1: The site of the undescended testes in the seventy patients

Site of the testes	Group I (35 cases)	Group II (35 cases)
	No. (%)	No. (%)
Superficial inguinal pouch	20 (57.1)	18 (51.4)
Scrotal neck	6 (17.1)	7 (20)
External ring	5 (14.2)	6 (17.1)
Intracanalicular	4 (11.4)	4 (11.4)

Fisher exact test

Table 2: The post-operative complications occurred in the seventy patients

Post operative complications	Group I (35 cases)	Group II (35 cases)
	No. (%)	No. (%)
Haematoma	2 (5.7)	0 (0.0)
Atrophy	1 (2.8)	0 (0.0)
Reascent	2 (5.7)	1 (2.8)
Total	5 (14.2)	1 (2.8)

Fisher exact test

DISCUSSION

UDT is considered one of the most common disorders in childhood occurring in 30% of premature infants and 1-3% term infants, decreasing to 1% by 1 year of age.[4,5] The basic principles in the surgical management were established in the last century, involving concurrent inguinal and scrotal incisions.[6] The classic inguinal approach is universally acceptable, easy to learn and perform, provides adequate visualization and mobilization of the testicle to be relocated in the dependent scrotal position as well as it allows separation and high ligation of the hernia sac.[7] In a study done by Misra *et al.*,[7] , they introduced a modification to the Bianchi and Squire[3] original technique through a low transverse scrotal incision. However this modification was argued that it does not help to find the testis and does not allow adequate creation of scrotal pouch.[8] But bearing in mind the anatomical difference between the child and adult regarding the inguinal canal; that it is clearly shorter, less oblique plane running in a more antero-posterior direction, skin and subcutaneous tissue are thin and mobile and that nearly 80% of UDT are palpable and low so being amenable for scrotal approach.[3,4,9,10] Bianchi and Squire[3] and Hazebroek *et al.*,[11] confirmed that in the majority of palpable testes neither the vessels nor the vas are the limiting factor but actually after dissection of the cremasteric muscle and PPV if present help to locate the testis into the scrotum without tension.

The PPV has been claimed to be a contraindication for scrotal approach to the extent that some authors concluded that if PPV is detected conversion to the inguinal approach should be done to complete the orchidopexy and do herniotomy.[10] The incidence of PPV in association with UDT is quite variable in the literature varied from 20% to 70%.[10,12] Dayanc *et al.*[13] found that the incidence of PPV in his series was 35%. In our series, the incidence of PPV was 65.7% without statistical significant difference between both groups or being a limiting factor for the scrotal approach.

Both Caruso *et al.*,[4] and Parsons *et al.*,[10] reported that single scrotal incision is simple and safe for boys with palpable UDT. In this study, the complication rates were comparable to other reported in the literature[8] without statistical significant difference between both groups.

Some studies reported short mean operative time for scrotal approach.[13] In this series, the mean operative time for Group I (after excluding the three cases converted to the inguinal approach) was significantly shorter than that of Group II ($P < 0.001$).

Few studies investigate the success rate of this technique with more proximal testes. Docimo[14] reported that more proximal testes tend to have a poor outcome. However Gordon *et al.*,[8] in their series reported that transcrotal orchidopexy can be attempted for proximal UDT, bearing in mind that if more length is needed to bring the testis into the scrotum a second groin incision can be safely made. Dayanc *et al.*,[13] found that single scrotal incision can be sufficient for orchidopexy in patients with

palpable UDT with an overall success rate of 94%. This success rate dropped to 89.5% for proximally located testes. In our series, the overall success rate for single scrotal incision group (Group I) was 91.4% dropped to 66.6% for proximal testis. This lower success rate for proximal lestis compared with that of Dayanc[13] may be related to our small sample size and also reflects that the rate of conversion to the inguinal approach is more common for high UDT specially that our patient's selection was randomly determined regardless of the testicular position. The rate of conversion from high scrotal incision to inguinal approach is quite variable in the literature; ranging from 0% to 13%.[8] In this study 3 cases (8.5%) of Group I converted to the classic inguinal approach to gain more cord length. All these 3 cases and the 35 cases from group II had their testis in the scrotum by the end of the procedure.

CONCLUSIONS

Although single scrotal approach has many advantages; one wound to close with less tissue dissection, short operative time and acceptable complication rate but it may not be the procedure of choice for proximal testis.

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