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Orchiopexy through a single high transverse scrotal incision

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ABSTRACT

Background: Palpable Undescended Testis (PUT) represents a common paediatric problem in many premature and some mature infants. There are several surgical techniques to correct PUT either through combined inguinal and scrotal incision or single transverse scrotal incision. This study assessed single high transverse scrotal incision for the management of PUT as regards to feasibility, postoperative success and final cosmetic results. **Materials and Methods:** One hundred twenty patients were managed at the Paediatric Surgery Department of Tanta University Hospital with PUT during the period from March 2010 to March 2014. They were all operated at the age of 6-12 months. We excluded recurrent cases, and cases older than 12 months. Through high transverse scrotal incision, the layers were divided, and the canal entered through the external ring, dissecting the PUT and bringing it through the incision. Hernia sac, if present, was ligated at the neck. Creation of the dartos pouch was then made through the same incision. All infants were followed-up at 1 month, 2 months and 6 months to detect any re-ascended cases, testicular atrophy and the final cosmetic appearance. **Results:** A total of 140 PUTs were operated upon in 120 patients. PUT was bilateral in 20 patients, right-sided in 65 cases and left-sided in 35 cases. Thirty testes were located at the external ring; the others were located within the inguinal canal. No cases needed a redo operation, and there was no case of postoperative testicular atrophy. **Conclusion:** Single high transverse incision was sufficient to deal with PUT especially, in young infants (age 6 months) with no need for conversion in most cases to the traditional two incisions technique, and good long term follow-up and a better cosmetic results.

Key words: Orchiopexy, scrotal incision, undescended testis

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INTRODUCTION

The incidence of Undescended Testis (UDT) is 30% in premature infants, and it is reduced to 1-3% in full term infants. This condition has been categorised as either palpable or impalpable UDT. About 80% of cases are of palpable category.[1-4] There are different surgical techniques that have been used to treat the Palpable Undescended Testis (PUT) (orchiopexy) and all depend on successful placement of the testis within the scrotum. A conventional inguinal approach with subsequent scrotal incision is the standard and generally accepted technique in most cases in the belief that adequate mobilisation isn't possible without it, and it is easy to deal with the associated hernia sac and its high ligation.[5-8] Due to the mobility of the skin of the infant and the short distance between the external and internal inguinal rings, this permits mobilisation of the testis and easy separation of the processus vaginalis from the vas and vessels through single scrotal incision.[9,10] We evaluated the feasibility and postoperative success of high transverse single scrotal incision in the management of all PUT even those situated close to the internal ring.

MATERIALS AND METHODS

During the period from March 2010 to March 2014, 120 infants with PUT presented to Paediatric Surgery Unit in Tanta University Hospitals. We preferred operating them at the age of 6 moths but we operated cases up to 12 months age. We excluded recurrent cases, children older than 12 months and infants with small sized testis compared to the other side or proved with inguinoscrotal ultrasound (US), which was done as routine investigation to all our infants for determination of the volume of the UDT. Also, we excluded retractile cases.

All infants received general anaesthesia with either endotracheal intubation or laryngeal mask with or

without caudal block as postoperative analgesia. Prophylactic 3rd generation cephalosporin antibiotic (50-100 mg/kg) was given at the induction. Preoperative all infants were examined again under general anaesthesia to the proper location of the PUT.

A transverse skin incision along the upper most creases of the scrotal skin was made [Figure 1]. Dissection of the subcutaneous tissues and fascia was carried down to the tunica vaginalis [Figure 2]. Gubernaculum attachments were divided if present. Mobilisation along the spermatic cord was performed with gentle traction on the testis or gubernaculum attachment, this was done without incising the external oblique apponeurosis. When an additional cord length was required, further dissection was done through this incision after upward traction of the upper lip of the scrotal wound [Figures 3 and 4]. The processus vaginalis was separated from the spermatic cord and dissected high into the inguinal canal, where it was ligated [Figure 5]. Through the same incision a pouch was created between the skin and dartos fascia. Then the testis was brought into the dartos pouch, and the pouch neck is tightened with a simple interrupted absorbable suture, which was a main stay to prevent testicular re-ascent. Closure of the dartos muscle was done using simple interrupted absorbable sutures. The skin was closed using a simple running subcuticular suture after ensuring that the testicle was residing in the bottom of scrotum [Figure 6].

The operation was carried out as 1 day case surgery, and the infants were discharged on the same operative day on scheduled follow-up weekly for 1 month and then every month for 6 months. Three months postoperative, assessment of the testicular volume by ultra sound was done to compare pre- and post-operative results. The degree of parents' satisfaction was recorded for both cosmetic and successful testicular position by making a score of good, fair and poor depending on the degree of satisfaction.

RESULTS

During the period from March 2010 to March 2014, we operated 120 children with PUT. One hundred infants were operated upon the age of 6 months, 7 children at the age of 1 year and 13 children with age from 6 months to 1 year with a mean age 6.8 months. In those children, PUT was bilateral in 20 cases, 65 on the right side and 35 cases on the left side.

Figure 1: High transverse scrotal incision

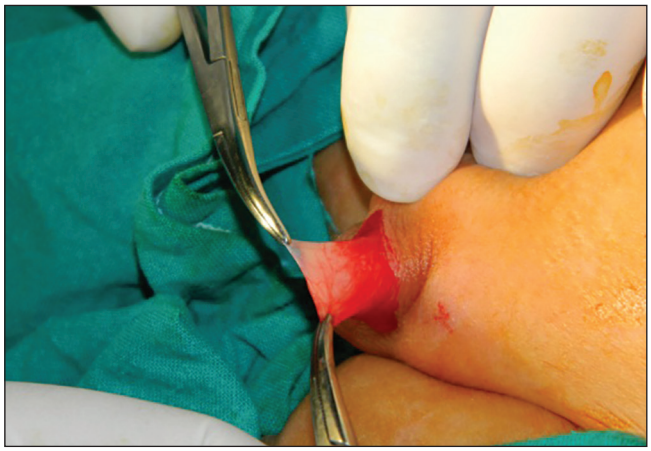

Figure 2: Dissection of subcutaneous tissue

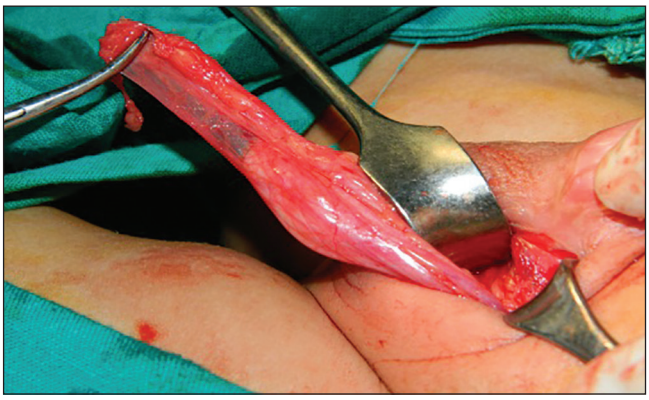

Figure 3: Delivery of the testis with its attached Gubernaculum

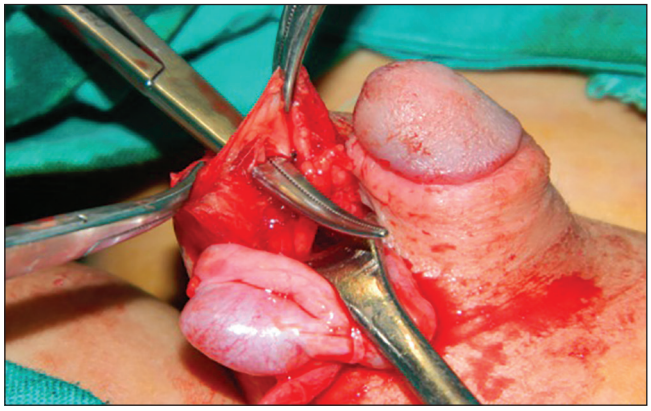

Figure 4: Freeing of the testis from attached processus vaginalis

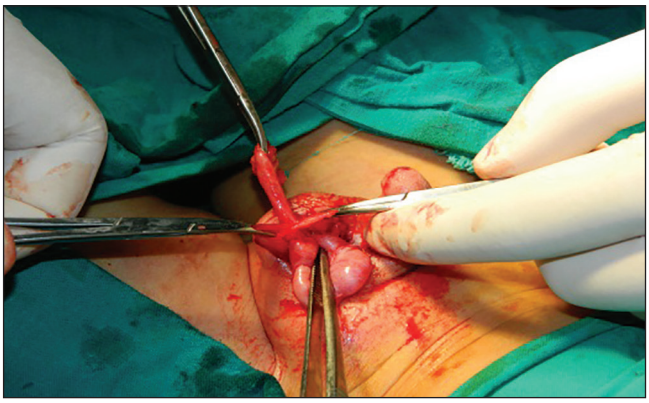

Figure 5: Ligation of the sac through the same incision

Figure 6: After orchiopexy and closure of the single incision

The testes were placed at the external ring in 55 cases, 70 at the internal ring and 15 at midway. Four cases with 7 testes were converted to the traditional inguinal approach because there were extensive adhesions to the cord (one case was bilateral), the testes were placed under tension through the high transverse scrotal incision alone due to short cord (two cases bilateral), and a case with inability to ligate the hernia sac at the proper internal ring. Associated hernia sacs were found in 80 patients (90 testes of 140 testes) (64.28%). Ligation of the hernia sac was done in all cases through the transverse scrotal incision except for the four converted cases. The mean operative time was 17 min in unilateral cases and 30 min in bilateral cases.

Postoperatively, five patients developed oedema that responded to medical treatment. No cases presented with testicular re-ascend during the follow-up period. US performed on the 3rd postoperative showed that there were no cases of testicular atrophy in any patient. One hundred and twelve parents were satisfied and scored both final cosmetic results and testicular position as good as, while 8 parents scored them as fair [Table 1 and 2].

Table 1: Demographic and preopertive data

Demographic and preoperative data	Number of cases (%)
Age	
6 m	100
6-12 m (mean 6.8 m)	13
12 m	7
Side	
Right	65
Left	35
Bilateral	20

Table 2: Operative and postoperative data

Operative and post operative data	Number of cases
Position related to canal	
Distal to EIR	55
At IIR	70
In between EIR and IIR	15
Orchiopexy	
Scrotal	116 (96.66)
Converted cases	4 (3.3)
Causes of conversion	
Short cord	2 cases bilateral
Extensive dissection to reterperitonium	1 case bilateral
Difficulty at dealing with hernia sac	1 case unilateral
Hernia sac	
Present	80 cases with 90 testis
Absent	40 cases with 50 testis
Postoperative complications	
Wound infection	No cases
Scrotal edema	5 cases
Testicular re ascend	No cases
Testicular volume by US (mean in mm^3)	
Preoperative	958.4
Postoperative	975.3
Parents satisfaction	
112 parents	Good
8 parents	Fair

EIR: External inguinal ring; IIR: Internal inguinal rings; US: Ultrasound

DISCUSSION

There is no change in the incidence of cryptorchidism, and it has remained constant over the last years and it's lower in full term infants than preterm infants.[7]

Along past years, the traditional inguinal approach remained the standard operative treatment of PUT, and it was proven to be effective and safe method of orchidopexy. It requires two incisions one in the inguinal region, which lies transverse and scrotal incision to create the dartos pouch for the coming testis. It is believed that inguinal incision helps adequate mobilisation of the testis, and proper ligation of the sac at the internal ring.[10]

During the 1980s, Bianchi and Squire described their technique for orchidopexy through single transscrotal incision, which was becoming accepted as effective and less invasive method for treatment. This was helped by the differences that existed between the inguinal canal in adults and infants, in that the canal in infants is relatively shorter and less oblique and the tissues are elastic and more mobile.[11,8]

We advocated operating our infants with PUT from the age of 6 months although we operated 20 cases above this age. This because it was proven that the fertility was improved, when operating at this early age.[12]

During our work, we excluded cases with previous inguinal operations, redo cases, retractile cases and patients with ectopic testis.

Several studies took in consideration these exclusion conditions.[1,4,7,5,13,14]

On the other hand, others did not consider these exclusion criteria during the same work.[9,15,16]

When we operated cases with proximal PUT near the IIR, we found it was easy to deal with the case and brought the testes in its new position.

Docimo showed in his study that more proximal testes tend to have a poorer outcome on operation, and this was widely accepted. But in the same context, Gordon's review showed that transcrotal orchidopexy can be attempted for proximal undescended testes, taking care that if the dissection of the cord wasn't enough to bring the testes down into the scrotum without tension, a second inguinal incision can be done.[17,18]

We did not suffer when dealing with the associated congenital inguinal hernia, and we properly ligated the sac at the proper neck and only one case was converted to the traditional approach as it was difficult to ligate the sac at the proper neck and the age of that infant was 12 months.

When Daynac reported his series, he noted that the rate of conversion was increased when PUT was more proximal in canal. The cause of conversion in these cases was the associated hernia sacs with a wide neck and need to achieve length for proximal mobilisation. He found that the rate of conversion in PUD distal to the ring was 2.3%, while it was in proximal cases 10.3% and concluded that it would be reasonable to approach such cases with the traditional two incision procedure.[10]

We believed that when operating cases from the age of 6 months, it would be easy to deal with associated hernia sacs whatever the position of PUD because at this age the external and internal rings are opposing each other and length of the canal is quite shorter than those of children included in other studies, which ranged from 1 to 12 years.

The rate of conversion to the traditional two incision procedure ranged from 0% to 14% with a mean of 4.4% during 20 years' experience with trans scrotal approach meta-analysis performed by Gordon *et al*.[18]

This rate of conversion was almost near to our rate that was 3.3% of cases taking in consideration that we didn't exclude proximal PUD, and we operated our cases at the age of 6 months.

During our follow-up of cases we had operated for a period ranged from 6 moths to 36 months we recorded no cases with recurrence of the problem or occurrence of testicular atrophy, which was confirmed both by clinical examination and testicular US.

Furthermore, no recurrences were recorded by Bassel, Dayanc, Handa, Bianchi, Samuel, Gokcora and Parsons.[3,5,7,9,11,13,19]

On the other hand, the recurrences rates were ranged from 1.2% to 8.4% but with both longer periods of follow-up and older children, which may play the main role for high recurrence rates.[1,4,14-16,18,20]

Parents of infants that were underwent that technique were satisfied with the final cosmetic results and the position of the testis when they asked to give a score of good, fair or poor.

CONCLUSION

We believe that single transverse high scrotal incision for orchiopexy of PUT is a reasonable approach especially, in infants at the age of 6 months and not associated with any morbidity, also it is easy to deal with the associated hernia sac without suffering and the parents satisfaction with final results is great.

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