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ORIGINAL ARTICLE

High single scrotal-incision orchidopexy as the standard technique in infants aged 6–24 months



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KEYWORDS

Undescended testis;
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ABBREVIATIONS

HSSIO, high single
scrotal-incision orchi-
dopexy;
(P)UDT, (palpable)
undescended testis

Abstract Objective: To prospectively investigate the effectiveness of high single scrotal-incision orchidopexy (HSSIO) for palpable undescended testis (PUDT) in infants aged 6–24 months.

Patients and methods: From March 2012 to July 2014, 46 age range-restricted (6–24 months) infants with 57 PUDT underwent HSSIO after obtaining written consent from their parents. The exclusion criteria were ectopic, retractile testes and recurrent cases. All infants were examined before surgery in the outpatient department and after anaesthesia induction immediately before surgery. All infants had general anaesthesia with a caudal block. The operative time, intraoperative and postoperative complications, and follow-up of the infants at 0.5, 3 and 6 months were recorded and analysed.

Results: The mean (SD; range) operative time was 23.45 (3.28; 18–29) min. A hernia sac was found in 39 (68.4%) UDTs. For postoperative complications, only one infant developed a scrotal haematoma that was managed conservatively. The procedure was successful in 56/57 PUDT (98%). An auxiliary procedure was needed in one case, to obtain more length of the cord by extension of the incision to the external ring.

Conclusion: HSSIO is a safe and feasible technique, with many benefits, and as such should be considered as the standard technique for orchidopexy in infants aged 6–24 months.

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Introduction

Undescended testis (UDT) is a common condition in children [1]. The classic technique for repair of an UDT is the inguinal procedure in which two incisions are made. The first incision, the inguinal incision, is made to view and dissect the spermatic cord; and the second, the scrotal incision, is made to prepare the site where the testicle is to be relocated [2].

The inguinal canal differs anatomically between adults and children, as it is shorter and the skin and subcutaneous tissue are highly mobile in children. A high percentage of UDTs are palpable and low lying, and thus considered suitable for scrotal orchidopexy [3].

As regards the inguinal canal length, Parnis et al. [4] reported that the inguinal canal length does not increase markedly in the first 10 years of life but remains short until the age of 2 years.

In the present study, we prospectively investigated the technique of high single scrotal-incision orchidopexy (HSSIO) in infants aged 6–24 months with palpable UDT (PUDT), with the hypothesis that it would be a highly effective approach with minimal morbidity.

Patients and methods

From March 2012 to July 2014, 46 age range-restricted (6–24 months) infants with 57 PUDT from the Outpatient Department, Benha University Hospital, underwent HSSIO after obtaining written consent from their parents. The exclusion criteria were ectopic, retractile testes and recurrent cases. All infants were examined before surgery in the Outpatient Department and after anaesthesia induction immediately before surgery. All infants had general anaesthesia with a caudal block.

Surgical technique

After sterilisation and towelling, a high transverse scrotal incision was made at one of the scrotal rugal skin folds (Fig. 1). Then an extra-dartos pouch sufficient to accommodate the testis was created, two stay sutures were placed in the dartos muscle (Fig. 2) and then the muscle was incised. The testis was exposed by compression of the inguinal canal, then dissection of its surrounding fascia, cutting the gubernaculum (Fig. 3) with identification of the hernia sac if present (39 testes). Cutting the sac into proximal and distal parts, the proximal part was subjected to traction for dissection until reaching the level of the internal ring (Fig. 4), transfixing ligature of its proximal part at the level of the internal ring and removing the sac. The distal part of the sac was everted as for hydrocoelectomy. Finally, the testis was fixed at the previously created extra-dartos pouch



Fig. 1 High transverse scrotal incision.

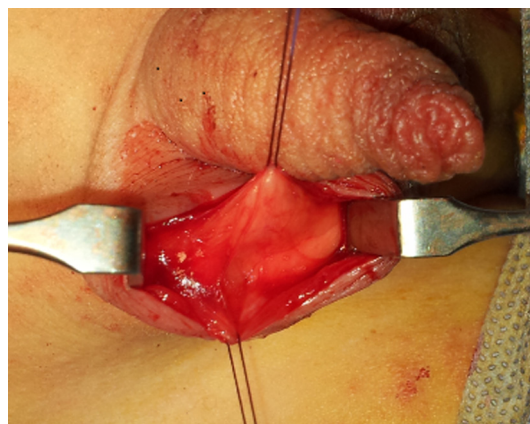


Fig. 2 Two stay sutures are placed in the dartos muscle.



Fig. 3 Delivery of the testis with surrounding fascia.

by narrowing the opening of the dartos layer over the cord to prevent re-ascend and fixation of the testis to the under surface of the scrotal skin, followed by skin closure with interrupted absorbable sutures (Fig. 5).

The technique was considered successful, if there was no need for any auxiliary procedure or conversion to the standard combined inguinal and scrotal approach.



Fig. 4 Dissection of the proximal part of the sac.



Fig. 5 Skin closure after fixation of the testis.



Fig. 6 Appearance at the 6-month follow-up.

Operative time, intraoperative and postoperative complications, and follow-up of the infants at 0.5, 3 and 6 months (Fig. 6) were recorded and analysed.

Results

In all, 46 age range-restricted (6–24 months) infants with 57 PUDT were included in this study. There were 18

Table 1 The infants' characteristics and perioperative data.

Variable	Value
Number of patients (number of testes)	46 (57)
Age, months, mean (SD; range)	15.35 (5.71; 6–24)
UDT side, <i>n</i> (%)	
Right	18 (39.13)
Left	17 (36.96)
Bilateral	11 (23.91)
Testis location, <i>n</i> (%)	
Inguinal	20 (35)
Subinguinal	37 (65)
Operation time, min, mean (SD; range)	23.45 (3.28; 18–29)
Hernia sac present, <i>n/N</i> (%)	39/57 (68.4)
Auxiliary procedure, <i>n</i> (%)	1 (1.75)
Postoperative complications, <i>n</i> (%)	
Haematoma	1 (1.75)
Success rate, <i>n/N</i> (%)	56/57 (98.24)

infants with right PUDT, 17 with left PUDT, and 11 had bilateral PUDT. At the time of surgery, the mean (SD; range) age of the infants was 15.35 (5.71; 6–24) months. According to testis location, the testes were classified into inguinal (20 testes, 35%) and below the external inguinal ring (37 testes, 65%). The mean (SD; range) operative time was 23.45 (3.28; 18–29) min. A hernia sac was found in 39 (68%) testes. An auxiliary procedure was needed in one case, to obtain more length of the cord by extension of the incision to the external ring. The infants were followed-up at 0.5, 3 and 6 months postoperatively, and only one case developed a scrotal haematoma that was managed conservatively. There were no cases of infection, pain, hernia recurrence, testicular atrophy or re-ascent. The success rate for the procedure was 98% (56/57 testes) (see Table 1).

Discussion

HSSIO is a highly effective approach, with perfect cosmetic results, when performed in infants with PUDT aged 6–24 months.

UDT is a common congenital anomaly, with a prevalence of ~30% in premature infants, 1–3% in full-term infants decreasing to 1% at the age of 1 year [5,6]. The standard approach for orchidopexy is a combined inguinal and scrotal approach, the inguinal approach for identification and mobilisation of the testis, dissection of the testis from its covering and the cremaster muscle, and ligation of the hernia sac if present at the level of the internal ring. The scrotal approach allows the creation of an extra-dartos pouch for the relocation of the previously dissected testis [7].

Bianchi and Squire [8] first described HSSIO in 1989, they ligated the hernia sac just proximal to the external ring, their success rate was 95.8%, and their failure cases were due to high intracanalicular testicular position. This technique may be unfamiliar due to the difficulty in ligation of the hernia sac through this incision as

described by Redman [9], Iyer et al. [10] reported on 367 cases of high scrotal orchidopexies, their success rate was 96.2%.

Misra et al. [7] adapted the Bianchi and Squire [8] approach and used a low transverse scrotal incision, but their technique was criticised as it cannot create a sufficient extra-dartos pouch and cannot reach intracanalicular testis [11]. Also Parson et al. [12] conducted 71 orchidopexies of palpable testes through a low scrotal incision; however, when there was a hernia sac they converted to the classic approach. So they proposed that the single scrotal incision is indicated only in cases without hernia sacs.

Parnis et al. [4] documented that between the ages of 6 and 24 months, the inguinal canal is short (0.7–1.1 cm), so proper dissection and ligation of a hernia sac does not need opening of the canal. Dayanc et al. [13] categorised their study according to the UDTs position into: the inguinal canal and below the external inguinal ring, with success rates of 89.7% and 97.6%, respectively.

The presence of a hernia sac in conjugation with an UDT ranges from 20% to 70% [12,14]. In the present series, a hernia sac was found in 68.4% of the UDTs and all were ligated properly at the level of the internal ring.

The conversion rate from HSSIO to the standard combined inguinal and scrotal approach ranges from 0% to 13% [11], in the present study there were no conversions to the standard approach. For postoperative complications, we had only one case of scrotal wall haematoma that was managed conservatively. All patients complied with follow-up and there were no cases of testicular atrophy, re-ascent or hernia recurrence during follow up of the infants at 0.5, 3 and 6 months.

In the present study, our success rate was very high at 98%, irrespective of the testicular position, either inguinal or below the external inguinal ring, and this is probably due to the age being restricted to between 6 and 24 months, as the inguinal canal is short and thus the undescended testis can be reached even if intracanalicular through the high scrotal transverse incision. We succeeded in completing the procedure safely without the need for any auxiliary procedure, except in one case where the external ring was opened as more cord length was needed.

None of the infants presented with bothersome pain, so there was no need for analgesics postoperatively. The procedure was considered as day case surgery. The limitations of the present study include the relatively few infants included and the lack of a control group (i.e.

standard combined inguinal and scrotal approach). We hope that a larger number of patients in this age range will be available for future studies.

In conclusion, HSSIO is a safe and feasible technique, with good cosmesis and apparently less discomfort for infants aged between 6 and 24 months. The very high success rate and few complications encountered, suggest that HSSIO should be considered as the standard technique for orchidopexy in this age group.

Conflicts of interest

None.

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