

Transscrotal orchidopexy for palpable cryptorchid testis: follow-up and outcomes

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Abstract

We retrospectively reviewed the results of transscrotal orchidopexy in the surgical management of palpable testis. From January 2014 to June 2017, 130 male children with a total of 140 palpable undescended testes (UDT) underwent transscrotal orchidopexy. The charts were retrospectively reviewed for demographic data, preoperative position and mobility of the testis, patency of the peritoneal vaginal duct (PVD), and post-operative complications. The resting position of the testis and its traction towards the scrotum were assessed before surgery and under anaesthesia. The

mean age of the patients was 4.6 years. The position of the testis assessed at surgery was in most cases at the external inguinal ring (62.8%), at the neck of the scrotum (15.7%), in the inguinal canal (12.8%), or in an ectopic position (8.5%). A PVD was found in 66 testes (47.1%). Two surgical cases required an inguinal incision. In each patient, the postoperative course was unremarkable. The testicle at 1-year follow-up was in a scrotal position in 134 cases, but 6 patients required a second surgical intervention for re-ascent of the testis. No testicular atrophy or inguinal hernias were observed. Transscrotal orchidopexy is a simple and effective procedure for the treatment of palpable UDT. The incidence of complications is low and manageable, with rapid postoperative recovery and early resumption of normal activities.

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Introduction

Undescended testis (UDT) represents a lack of descent of one or both testicles into the scrotum. It is present in 3 to 5% of male infants at birth, but by 6 to 12 months of age the prevalence of this malformation is spontaneously reduced to about 1%.¹ Surgical intervention then is indicated to improve fertility and reduce the risk of testicular tumors.² Clinically, these cryptorchid testicles in young children are usually classified as non-palpable or palpable. The former type may be absent or localized in the abdomen and therefore require a specific approach for diagnosis and therapy.³⁻⁶ However, 80% of patients present with palpable testes located at various levels of the inguinal canal between the external inguinal ring and the scrotum, and/or in an ectopic position.¹

The standard surgical intervention for orchidopexy was described by Schuller in 1881 and Bevan in 1899.⁷⁻⁹ The principal steps of this technique are represented by closure of the processus vaginalis and retroperitoneal mobilization of the spermatic vessels. A groin incision allows the exposure of the spermatic cord and a patent processus vaginalis that can be isolated and tied. The testicle is then positioned and fixed in a scrotal pouch formed of dartos fascia through a second scrotal incision as described by Shoemaker in 1932.¹⁰ Retroperitoneal mobilization of the spermatic cord, according to many authors, usually is not needed and should be reserved for the rare cases in which after the section of the processus vaginalis, short spermatic vessels do not allow positioning the gonad in the scrotum without being under tension.

We recently have seen the widespread use of minimally invasive surgery, which has undeniable advantages for both post-operative recovery and aesthetics. In 1989 Bianchi and Squire proposed for the treatment of palpable UDT, a minimally invasive technique characterized by an exclusive scrotal approach.⁹ This technique is less traumatic because it avoids opening the inguinal

canal while still allowing good access to the testis and funicular structures and good exposure of the PVD.¹¹ For this surgical technique to be performed, it is necessary for the testicle to be palpable and, if present in the inguinal canal, to have good mobility and traction toward the external inguinal ring and scrotum (which is a clinical finding in most cases). However, scrotal orchidopexy is still discussed because some authors doubt this technique to be able to provide an adequate cord length; whereas, others voice the concern that this surgical approach will not provide a sufficiently high ligation of a patent processus vaginalis.^{12,13} The present paper presents a 3-year retrospective review of all case records from transscrotal orchidopexy patients treated by the pediatric surgeons of Campania University "Luigi Vanvitelli" in Naples.

Materials and Methods

This retrospective study was approved by the institutional review board. Between January 2014 and June 2017, prescrotal orchidopexy was performed in our hospital on 130 male infants and children with a total of 140 palpable undescended testes. Charts were reviewed and demographic data were extracted for age of the patients; laterality, mobility, and preoperative position of the testis; and patency of the PVD. The post-operative course was reviewed for complications reported at 6 and 12 months. The resting position of the testis, its traction and mobility towards the scrotum, as assessed both before surgery and in the anesthetized patient was recorded. A classic inguinal incision was typically performed when the testis was not mobile, or when transscrotal orchidopexy was not able to reach an adequate length after dissection.

An incision of about 3 cm was typically made in a cutaneous fold high in the scrotal fold (Figure 1). A dissection was then made up through the scrotal tissue and the testis was exteriorized through the incision. The cremaster muscle fibres were divided by exposing the spermatic cord with the peritoneal vaginal duct, which then were separated from the funicular bundle, clamped, and dissected (Figure 2).

The PVD is easily isolated to the external inguinal ring and progressive traction is applied with high dissection, so as to tie it with a slowly absorbable suture as high as possible towards the internal inguinal ring. The deferent and the spermatic vessels are then long enough to allow the placement of the testicle in the scrotum without tension. An extra dartotic pouch is then made through the same scrotal incision and the testis is brought back into position through a passage made deep in the scrotal dartos tunica (Figure 3). If the length of the funicular tissue obtained after the vaginal process division is not sufficient for lowering the testicle into the scrotum without tension, an inguinal approach is then performed.

Results

Between January 2014 and June 2017 we performed prescrotal orchidopexy on 130 young boys, who were between 1 and 10 years of age (mean 4.6 years). Ten of the patients (7%) had bilateral cryptorchidism, 70 (54%) had a right cryptorchid testis, and 50 (38%) a left undescended testis, totalling 140 palpable testes. All of these testes were successfully moved down into the scrotum using a transscrotal approach in 138 of the 140 testes. The position of each testis was assessed at surgery: 22 (16%) were at the neck of the scrotum, 88 (63%) were at the external inguinal ring, 18 (13%) were at the lower side of the inguinal canal, and 12 (8%)



Figure 1. Eight-year-old boy with cryptorchidism: palpable undescended testes and scrotal incision shown.

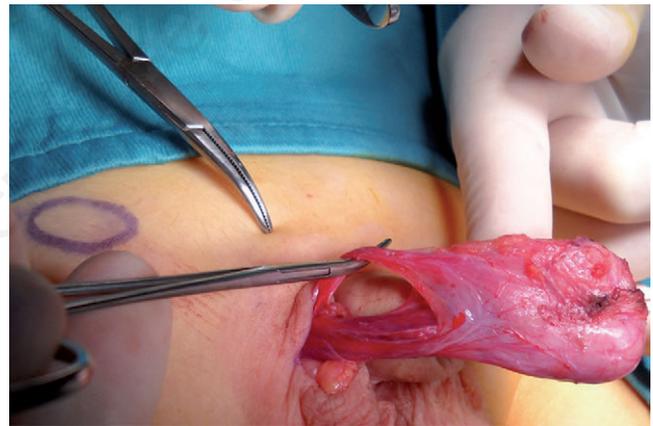


Figure 2. Dissection of peritoneal vaginal duct from scrotal incision.



Figure 3. Resting position of testis after the procedure.

were in an ectopic position. A patent processus vaginalis was found in 66 patients (47%). Two cases, who had originally the testis located in the inguinal canal, required an additional inguinal incision with mobilization of the retroperitoneal vessels and vas because of short spermatic vessels. The postoperative course was always unremarkable, and all of the boys were able to resume their normal activities in 4 to 5 days. The 1-year follow-up evaluations found that the testicles were in a scrotal position in 134 of the patients (96%). However, 6 patients were found to have had re-ascend of the testis to a high scrotal position, requiring a second procedure. We observed no testicular atrophy or inguinal hernias with total post-operative complications of 4%.

Discussion

Conventional surgery to treat cryptorchidism involves an inguinal approach, with release of the testicle, mobilization of the spermatic bundle, and opening of a peritoneal vaginal duct that can be tied sufficiently high. This surgery was proposed by Bevan in 1899 and Shoemaker with an extra-dartico pouch in 1932.^{8,10} Today, in the era of so-called *minimally invasive surgery*, many surgeons have adopted transscrotal orchidopexy first proposed by Bianchi and Squire⁹ in 1989 to decrease morbidity related to inguinal incisions. This approach has several benefits such as excellent cosmesis, minimal trauma and shorter operative time. Furthermore, it seems to be appropriate to adopt this technique given the short length of the inguinal canal in boys and because most of UDT are palpable, distal to external inguinal ring.

Nevertheless, some authors have several concerns about this technique such as the inability to gain enough cord length for orchidopexy and the difficulties of providing the high ligation of a patent processus vaginalis to prevent inguinal hernia.^{14,15} The surgical technique has been described by Bianchi, but some points have to be clarified because of some misinterpretations found in the scientific literature. The testis has to be palpable with good mobility and traction toward the external inguinal ring and scrotum. As reported by Bianchi and Squire in their original paper, all failures were encountered with high ectopic and immobile testes located in the canal.⁹ This finding was confirmed by Yucel *et al.*,¹² who reported a success rate of 50% with immobile testes and confirmed the lower success rate and a high need for a second inguinal incision in these cases. We believe that the highest success rates in our transscrotal orchidopexy series were related to patient selection: accurate examination, even under anaesthesia, is in our opinion the most important predictor of success and if the testis was not mobile and cannot be brought down near or to the scrotum we preferred to perform a classical inguinal incision. In our series, we had 18 patients who had the testis located in the inferior part of the inguinal canal and in two of them, we performed an inguinal incision, because despite the preoperative clinical examination and a high isolation of the PVD, the testis did not reach the scrotum as a result of the short length of the spermatic vessels.

Another concern raised by transscrotal orchidopexy is the difficulty of performing a high ligation of the PVD that risks testicular re-ascend and hernia development. Feng *et al.*¹⁴ found no significant differences in rates of hernia, hydrocele, or re-ascend of the testis between the two techniques in a systematic review comparing transscrotal and inguinal orchidopexy. In our series, at one-year follow-up we observed the re-ascend of the testis in six cases (4%). Bianchi's team at the Royal Manchester Hospital, in large

series that included a literature review related to this surgical technique in the last 20 years, reported excellent results after transscrotal orchidopexy with only a 2% recurrence rate, with follow-up range of 2 to 68 months.¹³ They concluded that this technique seems to offer comparable if not better results, but since that publication there have been few reports comparing inguinal and transscrotal orchidopexy. We are aware that our follow up is relatively short to evaluate complication rates following trans-scrotal orchidopexy such as recurrence. We advise patients to return to the clinic after 6 and 12 months after orchidopexy. In all cases, parents are warned that any migration of the testicle, swelling, scrotal emptying or change in testicular size should be immediately evaluated. In 1995, Docimo¹⁶ reviewed the literature for conventional orchidopexy and found that papers published after the 1985 reported a recurrence rate of 4%. This data were confirmed by Feng *et al.*¹⁴ who, in their systematic review, found only 8 studies on this topic, and only 2 of these were randomized, with small sample sizes. Because of the heterogeneity of the data, they concluded that further studies, entailing multicenter, randomized controlled trials, would be needed.

A PVD was found in our series in 66 cases (47%). This result is similar to studies.^{14,15} Because the mobility of the testes allowed easy isolation and dissections, we believe that, with traction on the cord, blunt dissection allows a high ligation of the sac. We did not observe any herniation and/or hydrocele formation in our series. In their study, Al-Mandil *et al.*¹⁷ reported 1 testicular re-ascend and 2 hernia complications. Misra *et al.*¹⁸ advised use of the inguinal approach if a hernia sac is discovered. In our experience, as well as that of other groups,¹³ that use this approach for inguinal hernia repair,¹³ it should be accepted that the presence of a PVD is not a disadvantage for this technique.

In the study from Royal Manchester Hospital¹³ where this technique was first adopted, the incidence of inguinal conversion was 2.5%. Feng *et al.*¹⁴ reported a rate of conversion from scrotal orchidopexy to the inguinal approach of 0 to 13% in their systematic review. In our study, we had to perform an inguinal incision only in two patients because the cord length was inadequate to reach the scrotum.¹⁹ In our opinion, the small rate of inguinal conversion could be related to patient selection where the resting position of the testis and its traction towards the scrotum is carefully assessed, evaluations that we believe necessary to best perform this technique.

Conclusions

Based on our findings, we can affirm that transscrotal orchidopexy is a simple and effective procedure for the treatment of palpable cryptorchid testis that lay distal in the inguinal canal and the external ring, with the exception of those that are not mobile and/or are located in a high position in the inguinal canal such as peeping testis. This surgical approach allows for optimal exposure of the PVD and easy separation from the vas and spermatic vessels. They thus can be dissected and tied high enough such that Bianchi recommends the transscrotal approach for treatment of all congenital inguinal pathology involving patency of the duct. An incision in the groin is only necessary in those cases where the spermatic cord is not long enough after the PVD is sectioned. The incidence of complications with this approach is low and manageable. This technique is less traumatic than the traditional surgery because it avoids unnecessary opening of the inguinal canal with obvious advantages in terms of comfort and early return to normal activities post-operatively.

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