Correction of incomplete penoscrotal transposition by a modified Glenn–Anderson technique

Amin Saleh

ABSTRACT

Purpose: Penoscrotal transposition may be partial or complete, resulting in variable degrees of positional exchanges between the penis and the scrotum. Repairs of penoscrotal transposition rely on the creation of rotational flaps to mobilise the scrotum downwards or transpose the penis to a neo hole created in the skin of the mons-pubis. All known techniques result in complete circular incision around the root of the penis, resulting in severe and massive oedema of the penile skin, which delays correction of the associated hypospadias and increases the incidence of complications, as the skin vascularity and lymphatics are impaired by the designed incision. A new design to prevent this post-operative oedema, allowing early correction of the associated hypospadias and lowering the incidence of possible complications, had been used, whose results were compared with other methods of correction. **Materials and Methods:** Ten patients with incomplete penoscrotal transposition had been corrected by designing rotational flaps that push the scrotum back while the penile skin remains attached by small strip to the skin of the mons-pubis. **Results**: All patients showed an excellent cosmetic outcome. There was minimal post-operative oedema and no vascular compromise to the penile or scrotal skin. Correction of associated hypospadias can be performed in the same sitting or in another sitting, without or with minimal complications. **Conclusion:** This modification, which maintains the penile skin connected to the skin of the lower abdomen by a small strip of skin during correction of penoscrotal transposition, prevents post-operative oedema and improves healing with excellent cosmetic appearance, allows one-stage repair with minimal complications and reduce post-operative complications such as urinary fistula and flap necrosis.

Key words: Hypospadias, penis, scrotal transposition

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Assistant Professor of Pediatric Surgery, Faculty of Medicine, Zagazig University, Egypt

Address for correspondence:
Dr. Amin Saleh,
Kafr Sakr Sarkia Egypt kafr sakr, Egypt.
E-mail: aminsaleh65@yahoo.co.uk

INTRODUCTION

Penoscrotal transposition is a rare anomaly of the external genitalia, characterised by malposition of the penis in relation to the scrotum. In complete transposition, the scrotum covers the penis, which emerges from the perineum. In incomplete transposition, which is more common, the penis lies in the middle of the scrotum. Both forms are most often associated with severe forms of hypospadias.[1]

This work aims to correct incomplete penoscrotal transposition by a modification of the Glenn–Anderson technique and to evaluate the effects of the designed modifications on the results of correction of transposition and associated hypospadias.

MATERIALS AND METHODS

Between 2004 and 2007, 10 patients, 1–9-years-old underwent surgery for incomplete penoscrotal transposition with severe hypospadias. The hypospadias were classified as subcoronal in two patients, penile in three, penoscrotal in two, scrotal in two and prineal in one. According to the location of the meatus after urethral resection and after release of chordee, the hypospadias were classified as proximal penile in two patients, penoscrotal in three, scrotal in three and perineal in two.

The anomaly was associated with incomplete testicular descent and iguinal hernias in five patients (two bilateral and three unilateral).

Surgical technique

With the patient in the supine position, lines of incision were drawn around the root of the penis to elevate the two halves of the scrotum as rotational flaps leaving the dorsal penile skin connected to the skin of the mons-pubis. The essential point of this technique is that the designed incisions do not meet in the midline as in the Glenn–Anderson technique,[2] but leave a bridge of skin of about 5–10 mm, separating the two incisions and connecting the penile skin to the skin of the mons pubis

[Figure 1]. Thus, no circular incision was performed around the root of the penis as in other techniques, and the penile skin remain connected and drained to the skin of the mons-pubis.

Two scrotal wings were thus created and mobilised by subcutaneous dissection. The next step was straightening of the penis and excision of the chordee. The median scrotal raphe was incised along approximately half its length, leaving the mobilised urethra completely free.

Complete mobilisation and fixation of the testes were performed in four patients. Herniotomy was performed in five patients (three unilateral and two bilateral) through the same scrotal approach.

The two scrotal wings were rotated inferomedially and sutured together with 4-0 vicryl sutures [Figure 2].

Hypospadias repairs were performed by tubularised incised plate[3] urethroplasty in the same sitting in two patients and 3–6 months after correction of penoscrotal transposition in eight other patients.

RESULTS

The follow-up period ranged from 6 to18 months. Satisfactory anatomical, cosmetic and functional results were obtained in all patients. Complications included urethral stenosis and urethral fistulas in one patient (10%), which were successfully treated with repeated dilatations, and no additional surgical correction was needed in any of the corrected patients.

The technique of correction did not include circumferential incision of the skin around the penile base and the penile skin was connected and drained to the skin of the mons-pubis. Minimal post-operative oedema that did not compromise wound healing was observed, which disappeared in a few days after surgery [Figure 3].

Operative scars did not constitute any handicaps for subsequent urethroplasties and no modifications were necessary.

DISCUSSION

Penoscrotal transposition was first reported by Appleby in 1923.[4] Patients with penoscrotal transposition often have accompanying urological abnormalities, such as chordee, hypospadias and vesico ureteric reflux.

Mcllvoy and Harris first performed surgery to move the penis into a more cranial position through a subcutaneous tunnel beneath the prepenile scrotum.[5]

Forshall and Rickham used a different technique in two patients in whom the cranially located scrotal flaps were elevated, rotated medially and caudally and sutured beneath the penis.[6] This method was also used by Glenn and Anderson[2] [Figures 4-6]. The technique was later modified by Dresner in 1982.[7] Mark and his colleagues, in 2000,[8] presented a radically divergent view of penoscrotal transposition, stating that the penis and not the scrotum is malpositioned. They transferred the penis after straightening into a button hole designed in the skin of the mons-pubis.

Complications after surgery for penoscrotal transposition include urethral and testicular injury, urinary fistula, flap necrosis and penile oedema. Circular incision at the root of the penis partially compromises lymphatic drainage, which may interfere with healing of the neourethra.[9]

Observation of patients corrected by the Glenn–Anderson technique showed gross oedema that persists for long periods (6–9 months) and, after resolution, leaves the penile skin dusky and darkly pigmented, appearing as the scrotal skin.

In this neodesigned modification of the Glenn–Anderson technique, the preserved strip of skin on the dorsum of the penis provides a good vascular bed for venous and lymphatic drainage. Thus, no gross oedema developed after operation, as seen in other techniques, and simultaneous correction of associated hypospadias can be performed without increasing complications.

Arena *et al*., in 2005,[10] reported 38% complications in their work, Glassberg *et al*., in 1998,[11] reported 50% complications and Koyanagi *et al*., in 1994,[12] reported 48% complications in their work. All of them used the same technique in the correction of penoscrotal transposition as compared with 10% complications in the designed modification of the Glenn–Anderson technique in our study.

CONCLUSION

Preservation of strip of skin at the root of the penis connecting and draining the penile skin to the skin of the lower abdomen during correction of penoscrotal transposition reduces post-operative oedema and lowers complications, with a better cosmetic appearance.

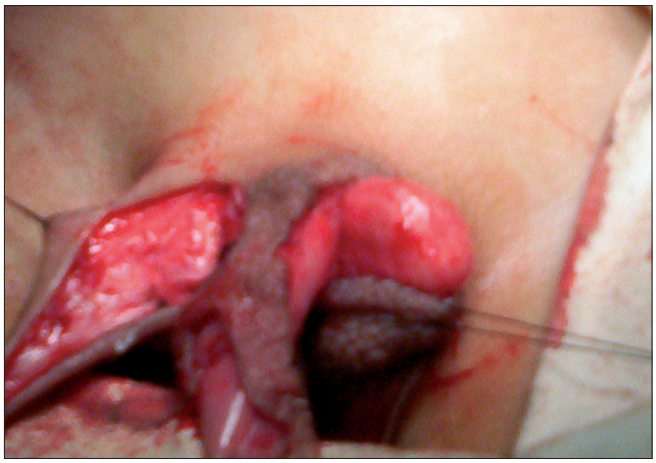


Figure 1: Two scrotal flaps were elevated and prepared fo rotation while penile skin is still attached to skin of lower abdomen

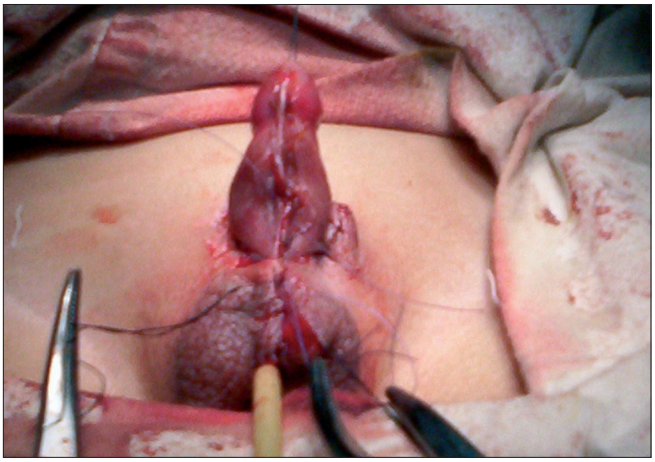


Figure 2: Scrotal flaps sutured and pushed the hypospadias into perineal position



Figure 3: 3 days after modified technique



Figure 4: Preoperative appearance of incomplete penoscrotal transposition

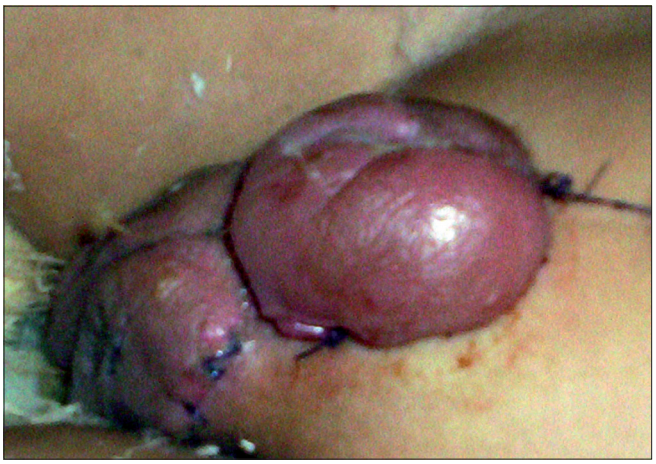


Figure 5: Postoperative appearance of Glenn-Anderson technique



Figure 6: One week after Amin's modified Glenn Anderson technique

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