


**Original Research Article**

# Our experience of penopubic epispadias repair by modified Cantwell-Ransley technique

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## Abstract

We have operated on penopubic epispadias about 8 cases using modified Cantwell-Ransley technique. Penile reconstruction included wide mobilization of the urethral plate from the underlying corpora based on a mesentery from the ventral penoscrotal skin, corporeal lengthening by dividing the suspensory ligaments and attachments to the undersurface of the pubis, urethral and glandular tubularization, chordee correction by medial incision of the corpora with anastomosis dorsal to the urethra and penile skin coverage. Postoperatively, repairs were intubated with silicone stents for 10 days. Two urethrocutaneous fistulas developed, 1 of which closed spontaneously. One patient had a small degree of penile skin loss that did not affect the neourethra. All patients currently have a cosmetically acceptable penis. In our study the patients age ranged between 15 years minimum age to 21yrs, because our center is a tertiary care hospital so the patients presented to us at elderly age. The low complication rate of this procedure coupled with the better anatomical configuration of the neourethra makes it useful for urethral and penile reconstruction.

## Key words

Cantwell-Ransley technique, Penopubic epispadias, Repair.

## Introduction

Epispadias is a rare congenital anomaly characterized by a dorsal urethral defect where it is replaced by a broad mucosal strip lining the

dorsum of the penis extending toward the bladder with the potential incompetence of the sphincter mechanism. In contrary to hypospadias, the current entity is not frequently discussed in the

society of urology, plastic and paediatric surgery, and it is because of its uncommon occurrence. Associated anomalies in patients with epispadias are deformed external genitalia, diastasis of the pubic symphysis and urinary incontinence. Nevertheless, a carefully constructed and well-planned approach is the prerequisite to the management of these patients [1, 2]. The objectives of repair must include achievement of urinary continence, cosmetically acceptable genitalia, normal genital function, and preservation of fertility potential in most cases. Here, we are interested to report such cases not only for its rarity but also to refresh our memory with respect to its surgical repair and outcome.

### **Aim**

We have evaluated our experience with the modified Cantwell-Ransley technique in penopubic epispadias.

### **Materials and methods**

We have operated on penopubic epispadias repair at our center during the period July 2012 to June 2015. A total no of 8 males with age between 15 years to 21 years underwent primary epispadias repair. The modified Cantwell Ransley technique was used for primary urethroplasty.

Pre-operatively we have assessed 8 patients for stress incontinence and urinary stream. 3 patients had mild stress urinary incontinence and 5 patients had splaying of the urine stream. Significant dorsal cordee was observed in four patient. In all the patients no abnormal widening of the pubic symphysis is noted. Other physical, laboratory and radiological investigations were unremarkable. We have assessed the flaccid penile length from penopubic junction to tip of the penis pre operatively and post operatively. All patients were operated under general anesthesia. The operative technique used was Modified Cantwell-Ransley technique. The procedure involves placement of traction stitches into the glans penis. A reverse meatal advancement and granuloplasty (MAGPI) or

Ipgam procedure performed at the distal urethral plate. After the initial urethral strip incision on the lateral edges of the urethral plate and around the epispadiac meatus the skin is dissected off and glans wings are created. The urethra is tubularized using a continuous running suture (5-0 chromic) over a No. 10 Fr infant feeding tube. Corporal bodies are incised dorsally at the point of maximum curvature that provides a diamond shaped extension of the incision. The corpora are then closed over the neourethra with two running suture of 5-0 polydioxone, and the diamond-shaped defects in the adjacent area of the corpora are sutured to each other. Glans wings and the skin are re-approximated with interrupted 5-0 polyglycolic sutures/chromic catgut. A Z-plasty at the base of the penis is closed with interrupted 5-0 polyglycolic sutures/chromic catgut. The dressing was kept for 10 days and the catheter is removed on the 15th post-operative day. The patients underwent regular follow-up examinations at 1, 3 and 6 months, till one year.

Post-operatively penis appeared acceptable cosmetically and length wise in all 8 cases. All the patients had acceptable conical shaped glans. Two patients developed post-operative fistula and 3 patients required urethral dilatation. Two patients developed skin infection in dorsal area it healed by secondary intention. The neourethra was intact in all the cases. Post-operative voiding was devoid of urinary splaying in all the cases. In all the cases there is no incontinence and all the patients had erections normally (**Photo – 1 to 21**).

**Photo – 1 to 8:** Images of patient.





**Photo – 9 to 14:** Images of patient 2.



**Photo – 15 to 21:** Images of patient 3.





## Results

During the study period, July 2012 to June 2015, 8 male adolescents underwent primary repair of epispadias using the modified Cantwell-Ransley technique. The mean operating time was  $140 \pm 24.6$  min. During the procedure, iatrogenic button holes occurred in the urethral plate in two children. The follow-up ranges from 2 months to 2 years.

Catheter was removed after 15 days. Urethrocutaneous fistulae occurred in 2. The appearance of the penis was acceptable at 12 weeks after surgery.

Fistulas that occurred in two, at the base of penis, the fistulas closed spontaneously on insertion of the catheter. Dorsal skin incision, infection, and separation were seen in two patients. The neourethra was intact in all these patients. The skin wound healed by secondary intention and none required secondary suturing. Stricture urethra was noticed in 3 patients. The stricture was noted at the proximal anastomotic site, could be managed successfully by urethral dilatation.

## Discussion

The isolated male peno-pubic epispadias is rare anomaly with incidence of 1 in 12,000 births. Although epispadias is considered to be the least severe defect of the exstrophy-epispadias complex, the treatment of this anomaly is far from trivial and repair can be challenging. There are two popular surgical techniques described well in the literature with their pros and cons; the first is the modified Cantwell technique, which involves partial disassembly of the penis and placement of the urethra in a more normal position and the second and most recent evolution is the complete penile disassembly. The drawback of modified Ransley techniques are persistence of short penile length and residual dorsal cordee that is likely to be eliminated in complete penile disassembly [3-5]. The major disadvantages of the Mitchell technique for epispadias repair are the necessity for aggressive dissection and occasional resultant of

hypospadias meatus that require 2<sup>nd</sup> stage urethroplasty. The major drawback in modified cantwell ransley technique chances of urethral skin necrosis over the glans and proximal part of the neourethra. This is because the urethral plate is usually shorter than the corpora cavernosa.

Here, we have discussed our experience with the modified Cantwell technique for isolated penopubic epispadias [6, 7]. This is the reason why the post-operative appearance was not satisfactory in one patient because healing occurred with secondary intention. Urethrocutaneous fistulas and urethral strictures represent the most common complications following the modified Cantwell-Ransley procedure. Surer and associates evaluated their patients three months post-operatively and found that fistula and stricture rate was 19% and 10% respectively. Ransley and colleagues reported a fistula rate of 4% and urethral stricture rate of 5.3%, although our series was small but two patients developed urethrocutaneous fistula. Most boys (up to 70%) with penopubic epispadias, the bones of the pelvis are widely separated [8-10]. This affects the bladder neck and external sphincter leading to incompetence and constant or stress urinary dribbling. There was no abnormal widening of the pubic symphysis in our case and none of the patient had urinary incontinence. Therefore, we have not considered for bladder neck reconstruction.

## Conclusion

Epispadias is a rare congenital disorder representing one end of the spectrum of the epispadias-exstrophy complex. Operative techniques involved in the repair of this condition are technically demanding. The care giver needs to be an experienced surgeon, with long-term commitment to these patients as many patients would require further more operations to achieve urinary continence, body image, and sexual function. In our experience, Cantwell-Ransley repair creates a functionally and cosmetically acceptable penis and produces a reliably tubularized neourethra with acceptable complication rates Surprisingly, in our study of

isolated penopubic epispadias, modified Cantwell Ransley repair was best suited for them and found to have satisfactory outcome.

The results of epispadias repair were assessed by both physical and endoscopic examination. All children who were old enough to opine as well as all parents/ guardians were interviewed during the follow up visits.

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