One-Stage Repair of Proximal Hypospadias Using Lateral Penile Flap—Preliminary Results in a Single-Center Experience

Horea Gozar · Mircea Ardelean · Simona Gurzu

Received: 3 April 2013 / Accepted: 11 July 2013 / Published online: 25 July 2013
© Association of Surgeons of India 2013

Introduction

Several surgical techniques, involving one-stage or multistage procedure, have been described over the years (more than 300 techniques) [1, 2], but the standard and most feasible reconstruction has not yet been identified for reconstruction of proximal hypospadias. Lateral-based flap technique is a single-stage urethral reconstruction used for proximal hypospadias with chordee [3, 4]. The aim of the present study was to describe our preliminary experience in this technique and to compare the results with those obtained by other surgeons.

Materials and Methods

This study included 10 consecutive patients with proximal hypospadias with chordee primarily corrected by using the one-stage lateral-based flap technique, which was carried out at the Clinic of Pediatric Surgery, Târgu Mureș, Romania, during January 2009 and January 2010. All the cases were operated by the same surgical team using the technique described by Hadidi [3] and Hadidi and Azury [4]. Processing of the cases was approved by the Ethical Committee of University

of Medicine and Pharmacy of Târgu Mureș, Romania. Written informed consent was obtained from each patient prior to beginning any research.

The urethral meatus was penile in seven cases and penoscrotal in three cases. All the patients had significant chordee, and the penile skin and foreskin were intact (Fig. 1). The skin flaps were shaped to achieve proper skin coverage. Byars' flaps were created to obtain a good coverage of the penis shaft with healthy skin (Fig. 1). Special attention was given to dissection to avoid bleeding and preserve well-irrigated tissues. The urethral catheter was not removed for 10 days postoperatively. Antibiotics were administered for the whole period, and dressings were changed 3–4 days postoperatively. Follow-up was performed at 4 weeks, 6 months, 1 year, and 2 years after surgery, and no functional or cosmetic disorders occurred during this period of time.

Results

The patients' mean age was 5.6 years (ranging between 2 and 16 years). All patients had severe chordee and a very thin ventral skin. There were seven proximal penile hypospadias and three penoscrotal hypospadias. Only two boys had glanular urethral plate and well-represented glans penis.

The average time of operation was 2 h and 30 min. There were no intraoperative complications, and postoperative edema was moderate. Out of the total 10 patients, eight presented good results: orthotopic glanular meatus, straight penis, and normal voiding. The other two patients presented postoperative urethrocuteaneous fistula at the level of the former meatus without associated stenosis. Both patients who presented complications were older than 8 years at the time of intervention. No cosmetic disorders were observed in the 2 years of follow-up period.

H. Gozar
Department of Pediatric Surgery, University of Medicine and Pharmacy of Târgu Mureș, Târgu Mureș, Romania

M. Ardelean
Department of Pediatric Surgery, Paracelsus Medical University of Salzburg, Salzburg, Austria

S. Gurzu (✉)
Department of Pathology, University of Medicine and Pharmacy of Târgu Mureș, 38 Ghe Marinescu Street, 540139 Târgu Mureș, Romania
e-mail: simonagurzu@yahoo.com

Fig. 1 Surgical correction of proximal hypospadias using lateral-based flap procedure. **a, b** Lateral and anterior preoperative view, **c** tubularization and rotation of the neourethra, and **d** postoperative view

Discussion

The lateral-based flap technique can be a useful procedure for the reconstruction of proximal hypospadias. The main advantage of this technique is the one-stage reparation.

In the severe forms of proximal hypospadias, besides the abnormal opening and stricture of the urethral meatus, there may be significant curvature, thick chordee, small or flat glans, and abnormal distribution of the foreskin-hooded prepuce and ventral deficiency of the skin [5]. These are common anatomical anomalies, but an abortive corpora spongiosum, a micropenis, or a scrotal transposition may also be encountered [6]. Thus, this malformation is complex and difficult to treat and postoperative poor cosmetics represents a significant problem [7].

The one-stage repair can be performed using the lateral penile skin [3] or buccal mucosal graft [8]. In the case of lateral penile skin (Hadidi's technique), the lateral penil skin is extended into the outer preputial skin; one of the advantages is that a double blood supply is ensured from the base of the meatus as well as the preputial vessels [3]. In the other case (Chen's technique), the buccal mucosa is taken from the inner cheek and fixed on tunica albuginea of the ventral shaft with suture, and the distally rotated meatal-basal flap is

covered by the buccal mucosal graft; both glandular tilt and chordee are completely correct [8].

In our study, the complication rate of Hadidi's technique was 20 %. This is a rather high percentage, when compared with the other two previous studies presented in Table 1 [3, 8]; however, our rate of success is comparable with that in the case of other operations carried out for proximal hypospadias [1, 2, 9]. One of the reasons for this high complication rate could be the patients' age, which was higher than that recorded in the other two published studies [3, 8], and much higher than the age of 6–12 months, recommended by the American Academy of Pediatrics [10], or 6–18 months, according to other clinical guidelines [11]. Both children older than 8 years presented fistula. To the best of our knowledge, there are no other published studies that have revealed the surgical experience regarding the correction of proximal hypospadias with lateral penile flap in children older than 2 years. The main complications of urethroplasties are fistula and dehiscence of the neourethra. The major cause of these complications is the stricture of the urethra produced by the deficiency of the glans and penile skin. Dysplastic glans and the lack of ventral skin barely allow us to cover the new urethra without stress (too strained). Thus, the major problem is not the reconstruction of the urethra, but appears when the urethra is incorporated into the glans and the shaft of the penis.

Table 1 The rate of postoperative complications after surgical correction of proximal hypospadias using lateral-based flap procedure

Authors	No. of cases	Age range (years)	Total % of complications	Fistula (%)	Dehiscence (%)	Urethral stenosis (%)	Urethral diverticulum (%)
Chen et al. [8]	21	1–8	10	10	–	–	–
Hadidi [3]	107	1–5	9	3	–	2	4
Present study (2013)	10	2–16	20	20	–	–	–

There are continuous efforts made to standardize the management of hypospadias [5, 12–14]. However, till date, there are no golden standards in hypospadias correction. The great variety and complexity of hypospadias demand flexibility from the surgeons. The therapeutic choice of treatment must be changed during the time of surgery when necessary, according to the anatomical particularities of the malformation.

In conclusion, lateral-based flap technique is a procedure that can be successfully used for one-stage repairing of some forms of proximal hypospadias, including those with severe chordee. There are some limitations of this study. First, it was conducted at a single institution, with small groups of patients being enrolled. Another potential weakness is the fact that the postoperative follow-up was based on a small number of patients. Despite the limitations, this study proved for the first time in the literature that proximal hypospadias can be treated in older children using lateral penile flap, but the complication rate is significantly high. The optimal operating time seems to be around or below 2 years. However, efforts should be made to improve the cosmetic appearance, urinary function, and functionality of the penis. Further studies with long-term follow-up are necessary to evaluate the cosmetic results after puberty.

References

1. Prat D, Natasha A, Polak A, Koulikov D, Prat O, Zilberman M et al (2012) Surgical outcome of different types of primary hypospadias repair during three decades in a single center. *Urology* 79:1350–1353
2. Jayanthi VR (2008) The modified Koyanagi hypospadias repair for the one-stage repair of proximal hypospadias. *Indian J Urol* 24:206–209
3. Hadidi AT (2009) Lateral-based flap: a single stage urethral reconstruction for proximal hypospadias. *J Pediatr Surg* 44:797–801
4. Hadidi AT, Azury AF (2008) Hypospadias surgery: an illustrated guide. Springer, Berlin
5. Hayashi Y, Kojima Y (2008) Current concepts in hypospadias surgery. *Int J Urol* 15:651–664
6. Kraft KH, Shukla AR, Canning DA (2010) Hypospadias. *Urol Clin North Am* 37:167–181
7. Rynja SP, de Kort LM, de Jong TP (2012) Urinary, sexual and cosmetic results after puberty in hypospadias repair: current results and trends. *Curr Opin Urol* 22:453–456
8. Chen W, Li S, Li Y, Yang M, Li Q (2006) One stage repair of hypospadias using meatal-based flap overlapping with buccal mucosal graft. *Zhongguo Xue Fu Chong Jian Wai Ke Za Zhi* 20:220–222
9. De Mattos E, Silva E, Gorduz DB, Catti M, Valmalle AF, Demede D et al (2009) Outcome of severe hypospadias repair using three different techniques. *J Pediatr Urol* 5:205–211
10. Ziada A, Hamza A, Abdel-Rassoul M, Habib E, Mohamed A, Daw M (2011) Outcomes of hypospadias repair in older children: a prospective study. *J Urol* 185:2483–2485
11. Bush NC, Holzer M, Zhang S, Snodgrass W (2012) Age does not impact risk for urethraloplasty complications after tabularized incised plate repair of hypospadias in prepubertal boys. *J Pediatr Urol* 9(3):252–256
12. Bhattacharya S (2010) A modified tubularized incised plate uteroplasty technique and a revised hypospadias algorithm. *Indian J Plast Surg* 43:21–27
13. Snodgrass WT, Bush N, Cost N (2009) Algorithm for comprehensive approach to hypospadias reoperation using 3 techniques. *J Urol* 182:2885–2891
14. Aulagne MB, Harper L, De Napoli-Cocci S, Bondonny JM, Dobremez E (2010) Long-term outcome of severe hypospadias. *J Pediatr Urol* 6:469–472