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Atsushi Nagai*

Yasutomo Nasu[†]

Masami Watanabe[‡]

Norihiro Kusumi**

Hiromu Tsuboi^{††}

Hiromi Kumon^{‡‡}

*Okayama University,

[†]Okayama University,

[‡]Okayama University,

**Okayama University,

^{††}Okayama University,

^{‡‡}Okayama University,

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Atsushi Nagai, Yasutomo Nasu, Masami Watanabe, Norihiro Kusumi, Hiromu Tsuboi, and Hiromi Kumon

Abstract

We investigated the usefulness of one-stage urethroplasty by the paramental foreskin flap method (OUPF procedure), which is useful for repairing all types of hypospadias. Between June 1992 and March 2001, the OUPF procedure was performed on 18 patients with hypospadias: 10 patients with distal and 8 with proximal hypospadias. The follow-up periods ranged from 33-75 months, with an average of 52 months. The duration of surgery, the catheter indwelling period, and the postoperative complications of each patient were analyzed. The median age of the patients at the time of surgery was 3 years and 8 months. The length of surgery for OUPF II ranged from 150-230 min (average 186 min), and from 190-365 min (average 267 min) for OUPF IV. Postoperative complications were confirmed in 3 of the 18 patients (16.6%). Two patients had fistulas, and one had a meatal regression. The fistulas were successfully closed by the simple multilayered closure method. After adopting DuoDerm dressings instead of elastic bandages for protection of the wound, no fistulization occurred. DuoDerm dressings are useful in the healing of wounds without complications. To date, the longest follow-up period has been 75 months, and during that time there have been no late complications such as urethral stenosis or penile curvature. OUPF is a useful method in the treatment of hypospadias with a low incidence of early and late complications.

KEYWORDS: hypospadias, one-stage urethroplasty, OUPF, DuoDerm dressings

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Original Article

Clinical Results of One-Stage Urethroplasty with Paramental Foreskin Flap for Hypospadias

Atsushi Nagai*, Yasutomo Nasu, Masami Watanabe, Norihiro Kusumi, Hiromu Tsuboi, and Hiromi Kumon

Department of Urology, Okayama University Graduate School of Medicine and Dentistry, Okayama 700-8558, Japan

We investigated the usefulness of one-stage urethroplasty by the paramental foreskin flap method (OUPF procedure), which is useful for repairing all types of hypospadias. Between June 1992 and March 2001, the OUPF procedure was performed on 18 patients with hypospadias: 10 patients with distal and 8 with proximal hypospadias. The follow-up periods ranged from 33-75 months, with an average of 52 months. The duration of surgery, the catheter indwelling period, and the postoperative complications of each patient were analyzed. The median age of the patients at the time of surgery was 3 years and 8 months. The length of surgery for OUPF II ranged from 150-230 min (average 186 min), and from 190-365 min (average 267 min) for OUPF IV. Postoperative complications were confirmed in 3 of the 18 patients (16.6%). Two patients had fistulas, and one had a meatal regression. The fistulas were successfully closed by the simple multilayered closure method. After adopting DuoDerm dressings instead of elastic bandages for protection of the wound, no fistulization occurred. DuoDerm dressings are useful in the healing of wounds without complications. To date, the longest follow-up period has been 75 months, and during that time there have been no late complications such as urethral stenosis or penile curvature. OUPF is a useful method in the treatment of hypospadias with a low incidence of early and late complications.

Key words: hypospadias, one-stage urethroplasty, OUPF, DuoDerm dressings

Although various types of one-stage urethroplasty such as onlay island flap urethroplasty, *etc.* [1-3], have been performed on hypospadias patients, and staged repair has been recommended for patients with severe chordee or highly deformed proximal hypospadias [4]. The idea that all types of hypospadias can be treated by one-stage repair using a one-stage urethroplasty with the paramental foreskin flap method (OUPF procedure) reported by Koyanagi *et al.* [5], has been receiving considerable attention. We performed the OUPF proce-

dure on hypospadias patients and discuss herein the surgical results as well as the surgical technique and postoperative care. In the present study, we investigated the usefulness of the OUPF procedure, having performed it on 18 patients in our respective institutions. Moreover, the usefulness of DuoDerm dressings in wound protection and prevention of postoperative complications is mentioned.

Materials and Methods

Over a period of 8 years and 8 months between June 1992 and March 2001, the OUPF procedure was performed on 18 patients with hypospadias at the Depart-

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*Corresponding author. Phone: +81-86-235-7287; Fax: +81-86-231-3986
E-mail: atsnagai@md.okayama-u.ac.jp (A. Nagai)

Table 1 Patient characteristics

Pt. No.	Age at Surgery (Yrs.-Mos.)	Operative Method	Length of Surgery (min.)	Catheter Size (Fr.)	Periods of Catheter Use (days)	Dressing	Abnormality or Past history	Postoperative Complications
1	3-1	II	165	6	7	bandage		
2	14-6	II	220	14	8	bandage	Chordectomy	
3	3-9	IV	220	6	7	bandage		
4	7-6	II	195	6	8	bandage		Fistula
5	3-6	II	225	6	5	bandage		
6	3-8	IV	330	6	11	bandage	Hypospadias Postop.	Fistula
7	4-2	II	170	6	7	DuoDerm		
8	3-5	II	150	8	7	DuoDerm		
9	3-3	IV	190	8	11	DuoDerm		
10	2-5	II	230	6	4	DuoDerm		
11	10-11	IV	335	10	7	DuoDerm	Bil. Cryptorchidism	
12	3-1	II	200	8	7	DuoDerm		
13	2-8	II	165	6	6	DuoDerm		
14	4-3	IV	365	6	7	DuoDerm	Bil. Cryptorchidism	
15	2-6	IV	270	6	12	DuoDerm		
16	5-3	IV	225	6	14	DuoDerm	Lt. Cryptorchidism	
17	3-8	IV	200	8	10	DuoDerm		Regression
18	4-9	II	145	8	7	DuoDerm		

ment of Urology, Okayama University Graduate School of Medicine and Dentistry; 10 patients had distal and 8 had proximal hypospadias. Bilateral testicular retention was observed in 2 patients, and left testicular retention in 1 patient with proximal hypospadias. Of the 10 patients with distal hypospadias, 1 had undergone a chordectomy. In addition, 1 of the 8 patients with proximal hypospadias had been subjected to an onlay island flap urethroplasty at another institution, but the procedure had failed due to postoperative infection. The age of the 18 patients at the time of surgery ranged from 2 years and 5 months to 14 years and 6 months (median age, 3 years and 8 months). OUPF II was performed on 10 patients with distal hypospadias and OUPF IV on 8 with proximal hypospadias (Table 1).

After informed consent was obtained from the patients' guardians, the plasty was performed according to the OUPF procedure described by Koyanagi *et al.* [5] under general anesthesia (Fig. 1). Regarding the patient whose onlay island flap urethroplasty had failed, a free skin graft was used on the dorsal side of the penis using a piece of inguinal skin. An elastic bandage was used in the 6 initial patients and DuoDerm dressings in the rest (Fig. 2). A 6 to 14 Fr. urinary balloon catheter was used in all patients. In the 2 patients with bilateral testicular retention, bilateral orchidopexy was performed

15 months and 23 months before urethroplasty. In the patient with left testicular retention, left orchidopexy was performed 6 months after urethroplasty. The duration of the postoperative follow-up ranged from 7-75 months, with an average of 49 months. The length of surgery, the catheter indwelling period, and the postoperative complications of each patient were analyzed.

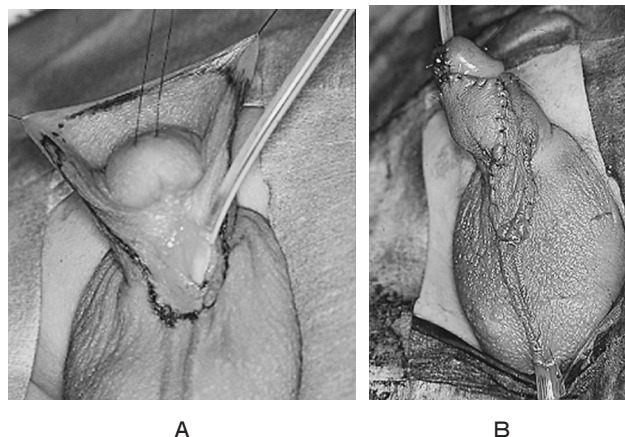


Fig. 1 (A) Preoperative appearance of a hypospadias penis. The penis is curved ventrally, and the meatus is visible in the penoscrotal region. (B) Penile plasty concluded by OUPF IV. The meatus has been transposed to the glans penis.

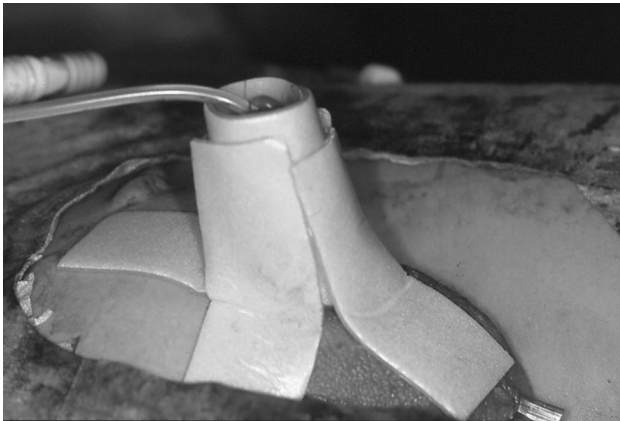


Fig. 2 DuoDerm Dressings used for wound protection.

Results

The time required to perform OUPF II ranged from 150–230 min (average 186 min), and for OUPF IV from 190–365 min (average 267 min). The period of indwelling urethral catheter after OUPF II and OUPF IV was from 4–8 days (average 6.6 days) and from 7–14 days (average 9.9 days), respectively. Postoperative complications occurred in 3 of the 18 patients (16.6%) (Table 1). Two patients had fistulas that were closed successfully by the simple multilayered closure method [7]. One had a meatal regression 5 months after surgery, although he had no urinary disturbance. At present, we are following all patients on an outpatient basis; major complications such as meatal or urethral stenosis or urethral diverticula have not been encountered.

Discussion

There have been few follow-up studies on the one-stage urethroplasty with paramental foreskin flap (OUPF) for hypospadias patients, which was developed by Koyanagi *et al.* [5]. The distinctive feature of OUPF is its one-stage repair of all types of hypospadias. In the present study, the OUPF procedure employed was almost identical to the original procedure. In the past, the two-stage repair was performed in our institutions, but with the establishment of one-stage repair methods such as the onlay island flap urethroplasty, *etc.* [1–3] the OUPF procedure was chosen. Of the 18 patients who underwent urethroplasty, fistula formation occurred in 2 patients (11.1%), meatal regression was observed in one

(5.6%), and the total complication rate was 16.6%. There was no significant difference in the catheter size and indwelling periods between the patients who developed fistulas and those who did not. Our complication rate is lower than that reported previously [5].

To prevent penile wounds following surgery, elastic bandages were used in 6 patients and DuoDerm dressings in 12 patients. For patients requiring DuoDerm dressings, none sustained fistulas. Mitchell [6] has reported the importance of dressings for hypospadias repair. The dressings were kept for 5–7 days and provided good protection and a healthy environment for healing. DuoDerm dressings contain moisture-reactive particles surrounded by an inert, hydrophobic polymer. The adhesive qualities of this polymer bind these particles and provide the structural matrix of the dressing. The dressings therefore remain firmly attached to the skin in the presence of moisture, which provides a significant clinical advantage. We believe that DuoDerm dressings are very useful in the healing of wounds without complications.

It has been reported that poor blood flow in the long paramental ventral preputial skin flaps increases the risk of fistula formation [8], necessitating careful handling of the skin flaps during surgery in this type of one-stage urethroplasty. Having measured the blood flow in the paramental flaps using a laser Doppler, Koyanagi *et al.* [5] have reported an 18% decrease in blood flow at the tip. To lower the rate of complications, use of a modified method has been reported [9, 10], although urethrocuteaneous fistula formation rates have remained 20–33.3%. Further modifications are necessary to lower the complication rate. However, if DuoDerm dressings are used instead of elastic bandages in the original method, a reduction in the complication rate can be achieved.

It is important to keep maintain a follow-up schedule with these patients until they are adults; our longest observation period, however, has been only 75 months. Nonetheless, OUPF appears to be a useful method in performing one-stage urethroplasty in hypospadias patients.

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