



Rapid intraoperative tissue expansion with Foley catheter in a challenging cripple Hypospadias

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ABSTRACT

Failed hypospadias cases may result in hypovascular, scarred penis with residual penile chordee and leave the patient with minimal residual skin for penile resurfacing and urethroplasty. Local tissue expansion has become a good alternative to provide skin for penis by using expanders however they require long periods of time for expansion. Besides, rapid tissue expansion was also described in different tissues. We used rapid intraoperative expansion technique by using a Foley catheter in a failed hypospadias case who had minimal residual skin secondary to infection and we concluded that rapid intraoperative tissue expansion with Foley catheter is an effective, feasible reconstructive method for easy dissection and penile resurfacing in failed hypospadias cases.

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INTRODUCTION

The risk of complications such as fistula, infection, residual penile curvature in hypospadias surgery is relatively high even though perfect surgeries are performed; correction of the complications with secondary surgeries are still challenging especially in patients with scarred, inadequate penile tissue (1). It is reported that when we evaluate all kind of complications the rate is between 1-90%. Several failed hypospadias surgeries may result in hypovascular, shortened, scarred penis with penile chordee and leave the patient with minimal residual local skin for penile coverage and urethral reconstruction (2). In

case of complicated hypospadias repairs, tissue for resurfacing of penis can be acquired from local tissue or from extragenital areas. Chronic tissue expansion was described for delicate tissues and in case of large tissue defects. Sasaki has described rapid tissue expansion and called it "intraoperative sustained limited expansion" which provided less tension and better cosmesis for closing large defects (3, 4). Besides, Vordermark described tissue expansion for penile reconstruction (5). By combining these methods, we used rapid intraoperative expansion technique by using a Foley catheter in a failed hypospadias case who had minimal residual skin secondary to infection.

PROCEDURE

A four-year old boy who was treated primarily a year ago in another center for penoscrotal hypospadias encountered infection following the first surgery which resulted in scarred, inadequate penile skin for reconstruction. The patient still showed penoscrotal hypospadias (Figure-1). By combining the advantages of rapid tissue expansion and local tissue usage, we decided to use rapid intraoperative expansion technique using a Foley catheter in this failed hypospadias case who had inadequate, fragile, scarred penile skin. Informed consent was obtained from parents for publication.

Under general anesthesia, following appropriate preoperative antibiotics, two incisions of 0.3 cm length were made to dorsum of penis at the corona, fashioned at 11 and 1 o'clock position. Then the tips of two 8Fr Foley catheters were trimmed, keeping the balloons intact. After blunt dissection, the catheters were inserted under the dorsal penile skin (Figures 2-4). The balloons were filled with 3 ml saline until the flaps were blanched. Balloons were inflated synchronously for four times for three minutes with a two-minute rest period. Easy dissection of the skin from the dorsal and lateral sides of the penis was achieved without bleeding. Following tissue expansion, adequate penile tissue was achieved to cover the penile shaft through Snodgrass repair (Figure-5). In four months follow-up, the penis has an optimal esthetic appearance with no fistula and with good urethral calibration (Figures 6 and 7).

DISCUSSION

We used rapid intraoperative expansion technique by using Foley catheters in a failed hypospadias case who had minimal residual skin secondary to infection. In the literature, Foley catheter has been described as a tool for rapid expansion in cleft palate repair, alopecia repair, tissue defect repair following mass excision such as basal cell carcinoma, melanocytic nevus from forehead, temple, eyelid, periorbital region and extremities (4, 6-10). The aim of this paper is to describe the use of Foley catheter in cripple hypospadias

Figure 1 - Preoperative view.



Figure 2 - Intraoperative view. First Foley catheter was inserted under the dorsal penile skin at 11 o'clock position.

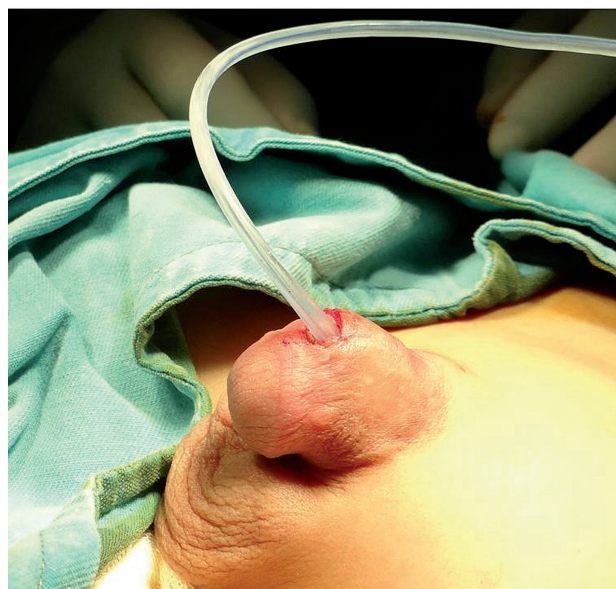


Figure 3 - Intraoperative view. The Foley catheters were inserted under the dorsal penile skin following incising the corona at 11 and 1 o'clock position.



Figure 4 - Intraoperative view. The Foley catheters were expanded under the dorsal penile skin.



Figure 5 - Postoperative view following penile reconstruction and urethroplasty.



Figure 6 - Ventral view of penis in one month follow-up.



Figure 7 - Dorsal view of penis in one month follow-up.



surgery for rapid intraoperative tissue expansion with easier dissection and less bleeding.

Tissue for resurfacement of penis can be obtained from local tissue or from extragenital areas such as buccal mucosa and skin. Extragenital skin grafts may result in loss of the graft, graft shrinkage, lack of sensation, hair bearing skin with different pigmentation (1, 4). Methods for local tissue resurfacement are dorsal relaxing incision, Z-plasty, rotation of a scrotal flap and burying the penis into the scrotum.

Tissue expansion is especially useful in those who lack enough penile skin and extragenital skin graft is not preferred. In the literature, authors reported that tissue expansion provides increased tissue area which is well-vascularized, sensate skin and excellent tissue match for pigmentation, texture and thickness (2, 4, 8, 11). It was also used in staged hypospadiass repairs (13). It also avoids the need to transfer tissue over a distance. For these reasons, local tissue expansion has become a good alternative to provide skin for

penis (2). Another advantage of local tissue expansion is the recruitment of additional skin with a similar distribution of androgen receptors for penile reconstruction as hypothesized by Kajbafzadeh et al. (1). Recently, besides chronic tissue expansion, rapid tissue expansion technique has also been used in different parts of the body by some authors. According to Auletta et al. immediate tissue expansion has provided enough tissue to close defects up to 5cm in diameter with 16-6% tissue expansion and according to Baker and Johnson although actual amount of skin increased during expansion is uncertain, it has been estimated as 31% (3, 6, 13). Although the authors described expansion of 30%, our case had nearly 10-15% of expansion. The reason for this small amount may be the small dimension of the scarred penis. Demirseren et al. described immediate tissue expansion with Foley catheter in a case of congenital melanocytic nevus and emphasized the advantage of omnidirectional expansion (7).

Expanders require long periods of time for expansion, may cause erosion, they are for single-use, expensive and difficult to use in children. Meanwhile, Foley catheters are readily available, inexpensive, disposable and practical for intraoperative tissue expansion (1, 9, 14, 15). Chronic tissue expansion has a potential risk of infection in children as discussed by Friedman et al. however this wasn't a significant problem in Mathews' series (2, 11). Also, chronic tissue expansion can be slightly uncomfortable to the patient, may create an unnatural distortion of the dorsum of the penis, requires multiple outpatient clinic visits, repeated inflations and may have psychological implications. According to Friedman et al. the major complications of chronic tissue expansion were implant exposure, deflations, wound dehiscence and minor technical complications with port, hematoma and significant pain (11). The authors describe the method as three to four cycles of inflation and deflation after placement of catheter for 3 to 5 minutes (3). Another advantage of rapid expansion is that it does not create a fibrous capsule in the expanded tissue because of brief dura-

tion avoiding retraction (4). Another advantage of this technique is to provide easier dissection with less bleeding in secondary cases and scarred tissues. By using this method, we were able to both dissect the dorsal and lateral penile skin easily without bleeding and also close the ventral defect.

The use of rapid intraoperative tissue expansion in failed hypospadias cases is an effective and feasible reconstructive method which provides additional sensate, hair bearing local tissue with excellent match of texture, pigmentation and thickness to the native penis.

CONFLICT OF INTEREST

None declared.

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