

THE USE OF DEPITHELIALIZATION IN URETHROPLASTY

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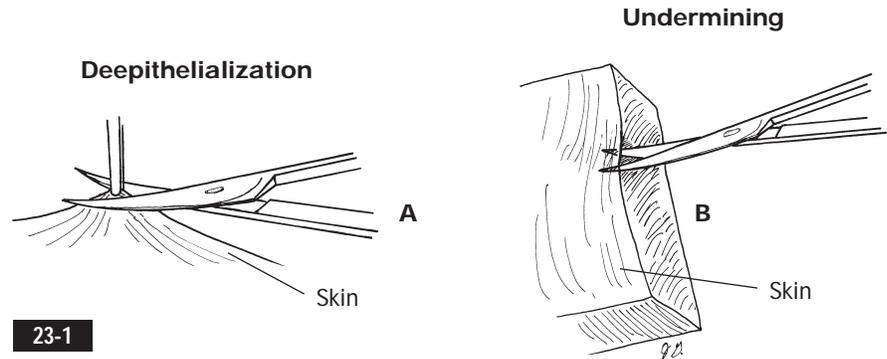
Healing in any reconstructive surgery depends on not only the intact arterial supply but also the reconstitution of venous and lymphatic drainage. Without adequate drainage, extracellular fluid collections form dead spaces and lead to complications.

The additional use of the deepithelialization technique in reconstructive procedures such as in hypospadias repairs and urethroplasties in the construction of the neourethra or as flaps to cover the neourethra has resulted in more successful outcomes with a significantly lower incidence of fistula formation.^{1,2}

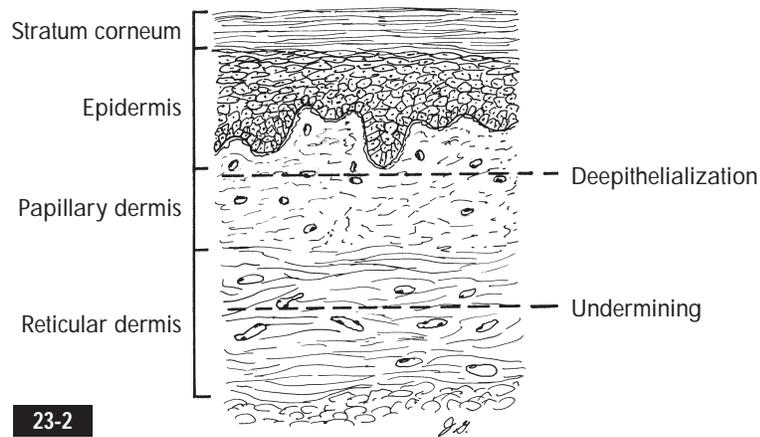
In contrast to deeper reticular dermis, superficial papillary dermis contains smaller caliber vasculature and lymphatic vessels. Removing the epidermis with the preservation of part of the papillary dermis not only avoids extensive trauma and hemorrhage but also maintains the integrity of more of the smaller caliber arteries, veins, and lymphatics. The traumatized smaller vessels seem to recanalize faster than the deeper, larger caliber vessels.

When the surgeon performs a deepithelialization procedure, the object is to harvest the epidermis while retaining in situ as much of the papillary and reticular dermis as possible.

FIGS. 23-1, 23-2, AND 23-3. We prefer to use the deepithelialization technique described by Belman¹ and Smith.² Cutting away the epider-



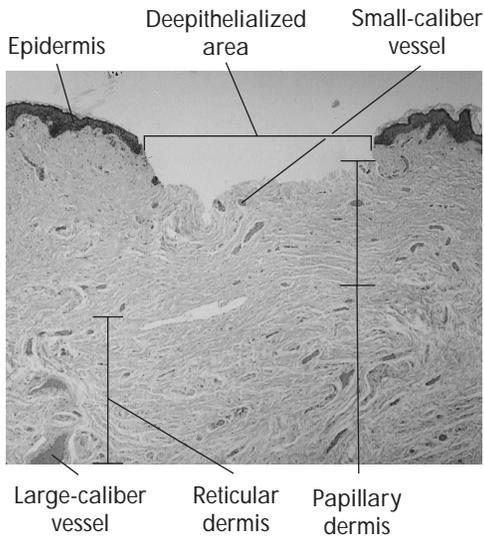
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23-2

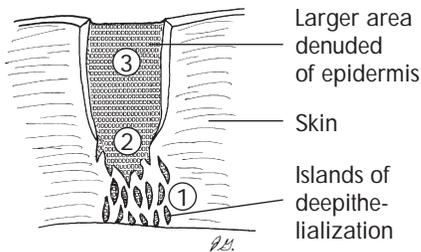
mis with fine tenotomy scissors (Fig. 23-1, A) produces the simplest and best results, even though the method is time-consuming.

In our experience, histologic examinations confirm that papillary dermis is preserved by this deepithelialization technique, whereas with undermining of the skin (Fig. 23-1, B) this dermis layer has a greater chance of being destroyed. Although much faster, skin undermining techniques seem to pene-

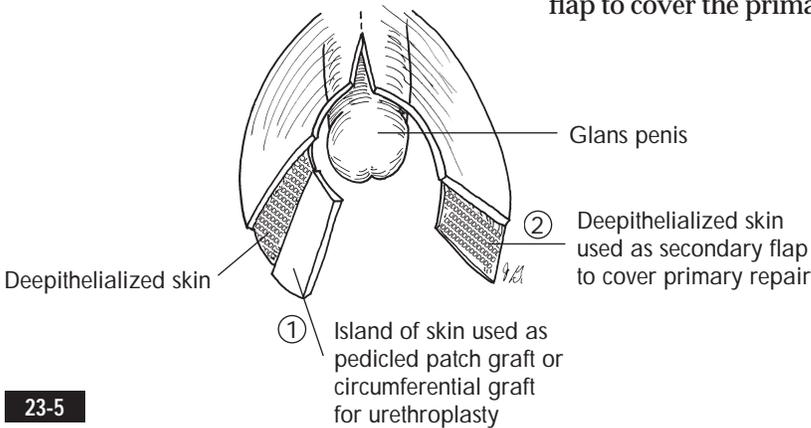


Courtesy Joan E. Woodward, M.D., Anne Arundel Medical Center; and Carmen M. Williams, M.D., George Washington University Medical Center.

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23-4



23-5

trate deep into the reticular dermis more often with resultant soft tissue trauma and hemorrhage.

FIG. 23-4. Although the deepithelialization technique is a tedious process, a large area can be denuded by taking small islands of epithelium (1) that collect into large areas (2 and 3). The surgeon does not need to use magnifying lenses to perform this procedure.

Belman¹ and Smith^{2,3} have used deepithelialized skin for flaps to cover hypospadias repairs with a resultant fistula rate of less than 5%.

We have adapted this same technique used in hypospadias repairs and incorporated it in urethroplasty procedures for adults with urethral stricture disease.

We have used pedicled flaps of preputial and penile skin for the neourethra and flaps of deepithelialized scrotal skin to cover the neourethra.

FIG. 23-5. For both hypospadias repair and urethroplasty, we have used partially deepithelialized flaps in which the remaining dermis serves as the pedicle of the neourethral graft (1). In addition, deepithelialized penile and scrotal skin has been used as a secondary flap to cover the primary repair (2).

FIG. 23-6. For a second-degree hypospadias repair involving midshaft hypospadias, the surgeon can select a skin segment for neourethra reconstruction and deepithelialize the skin surrounding the neourethra rather than undermining on both sides.

Deepithelialization ensures maximal integrity of the underlying arterial, venous, and lymphatic systems in the area of the neourethra.

The denuded area of papillary and reticular dermis should be used as flaps and reapproximated before skin closure.

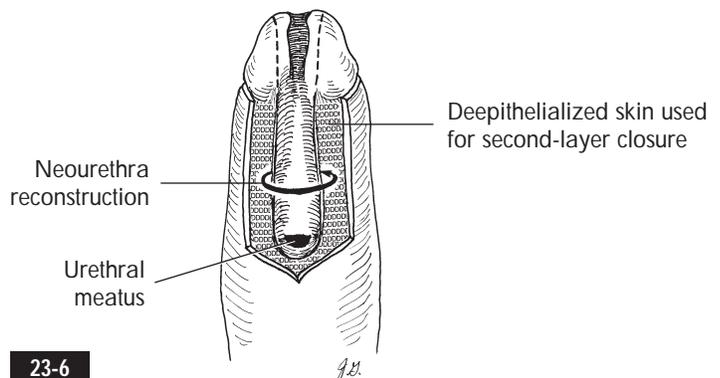
FIG. 23-7. For fistula closure, after the fistula is repaired primarily (1), deepithelialized skin around the fistular tract can be used as a dermal flap to serve as a second layer of closure (2) before the skin edges are reapproximated (3).

FIG. 23-8. For midshaft urethral stricture disease, the surgeon can incorporate deepithelialized skin around a selected pedicled skin graft. The opposite skin edge can be deepithelialized and used as a secondary flap to cover the neourethra.

FIG. 23-9. For posterior urethral strictures in which primary reanastomosis is not possible, a pedicled patch skin graft is useful.

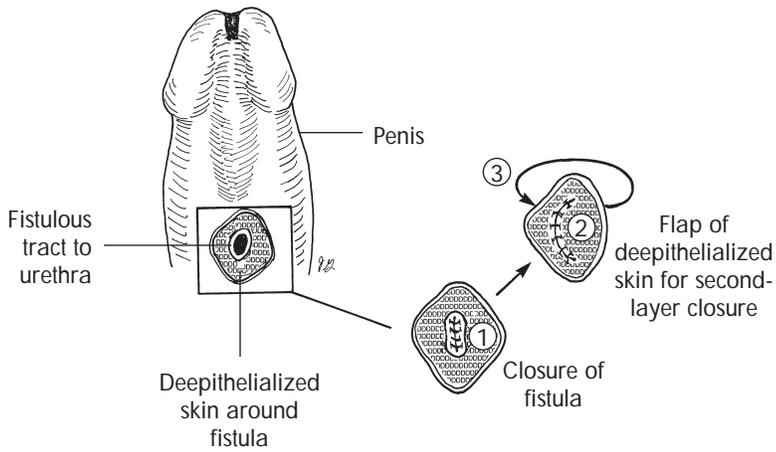
Penile skin, characterized as “wet” and not reactive to urine,⁴ can be tunneled from its origin to the reconstructive site.⁵

Deepithelialization for Hypospadias Repair



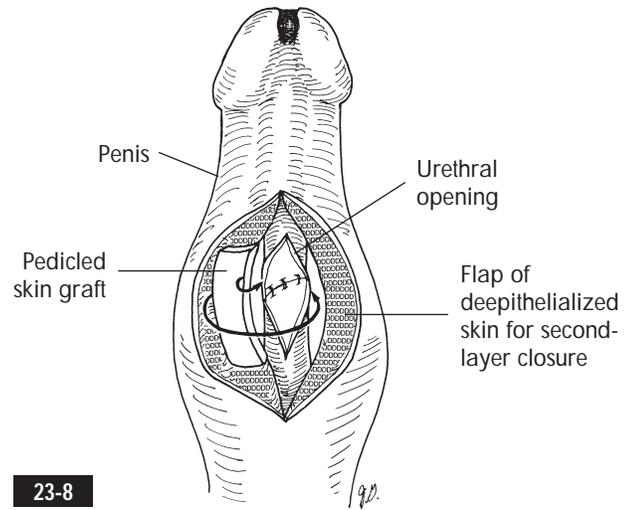
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**Deepithelialization for
Fistula Closure**



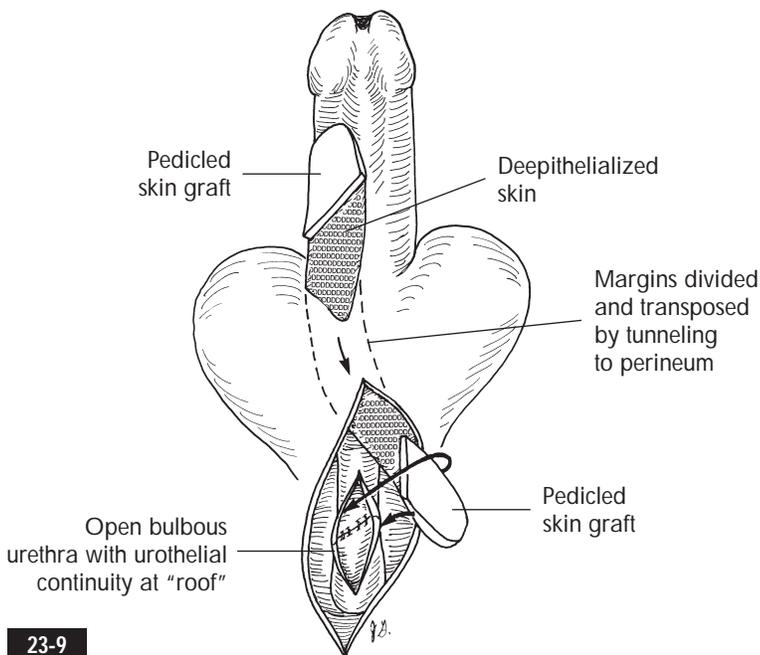
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**Pediced Skin Graft for
Patch Graft Urethroplasty**

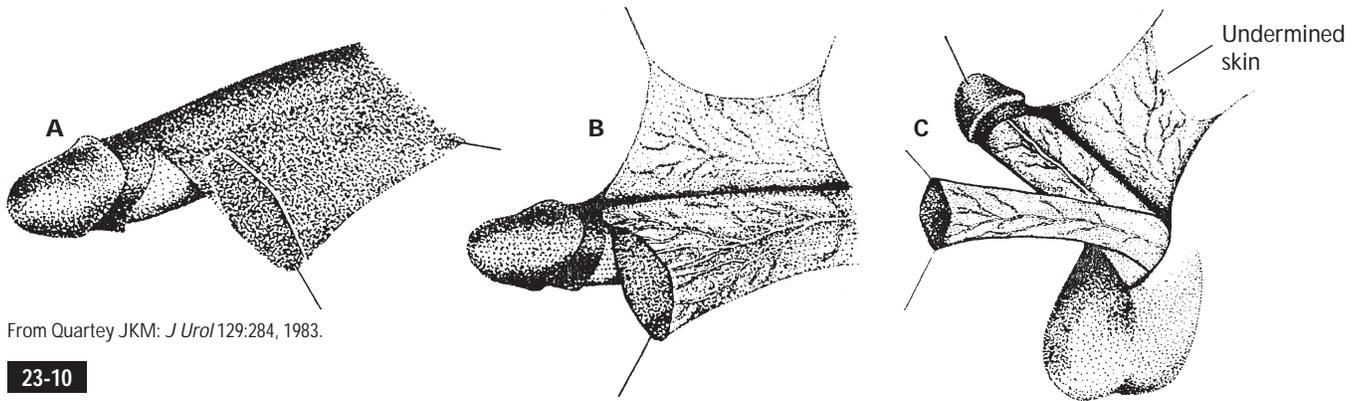


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**Deepithelialization to Preserve
Vascularity for Pediced Graft in
Posterior Urethroplasty**



23-9



From Quartey JKM: *J Urol* 129:284, 1983.

23-10

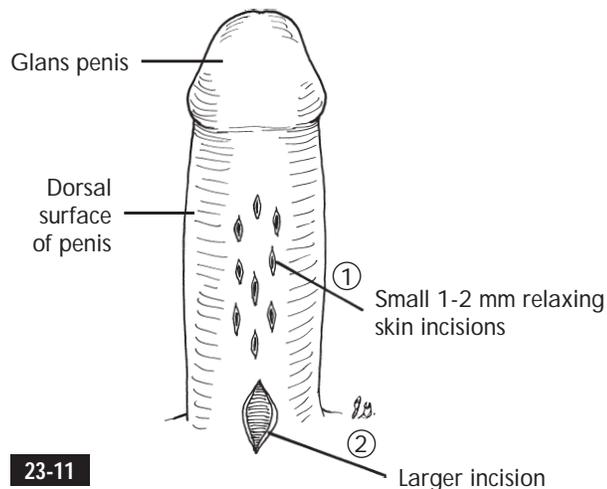
FIG. 23-10. Once the skin segment for the pedicled graft has been selected (A), the surgeon can deepithelialize the pedicled portion (B) instead of undermining the penis skin,⁵ free the deepithelialized segment (C), and tunnel it to the posterior urethral region.

This technique preserves the vasculature of the pedicled skin graft and that of the adjacent penile skin. In Quartey's series,⁵ one complication involved ischemia of the remaining penile skin on the undermined side (B and C).

Since the penile skin is not undermined but deepithelialized,

rolled in, and incorporated in the reconstruction, there is a tendency for there to be skin tension after a repair, especially during spontaneous nocturnal penile tumescence.

FIG. 23-11. We induce an artificial erection after the repair to evaluate skin tension and the potential for strangulation leading to ischemia. Relaxing incisions in the dorsal skin on the opposite side to the urethroplasty decrease this circumferential tension. Small 1 to 2 mm incisions (1) are preferable to large ones (2). These incisions heal spontaneously.



23-11

EXPERIENCE WITH TWO-STAGE URETHROPLASTY USING DEEPIHELIALIZATION TECHNIQUE

We have used the deepithelialization technique in one case of two-stage urethroplasty in which the entire urethra was strictured from the meatus all the way to the proximal bulbous urethra. This description illustrates the versatility and usefulness of the deepithelialization technique as an adjunct to complex urethroplasty.

First Stage

FIG. 23-12. Because the stricture involved the entire urethra, a complete urethrotomy was performed from the meatus to the proximal bulbous urethra (A). This maneuver essentially bivalved the scrotum.

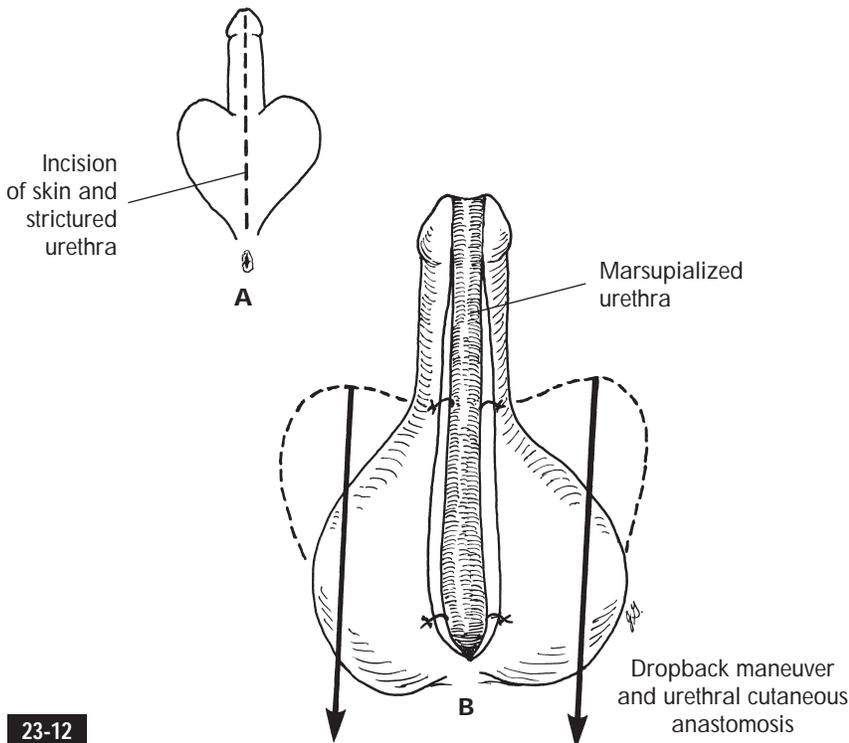
The scar tissue surrounding the urethral stricture was excised.

The remaining plate of urethra was stitched to the corporeal bodies to flatten it and then approximated to the adjacent penile and scrotal skin (B).

For the stricture involving the posterior urethra, a dropback maneuver was used. The scrotum was stretched posteriorly with the testicles and the scrotal skin was then sutured to the posterior urethral plate (see pp. 224-225).

During an observation interval of 6 months, two epilations were performed to remove hairs and several dilatations were necessary to break up mild strictures that occurred secondary to cross adhesions of the urethral plate. Testosterone cream was applied to the skin adjacent to the urethral plate from the penis to the scrotum to enrich the vascularity and soften the genital skin.

Total Urethroplasty for Complete Urethral Stricture—First Stage: Marsupialization of Urethra and Dropback Procedure



Second Stage

FIGS. 23-13, 23-14, AND 23-15. We selected the margins necessary to create a neourethra with a measured circumference equal to that of a 20 Fr catheter.

Instead of *undermining* the skin margin of the neourethra, we *deepithelialized* a plate of skin on both sides of the neourethra.

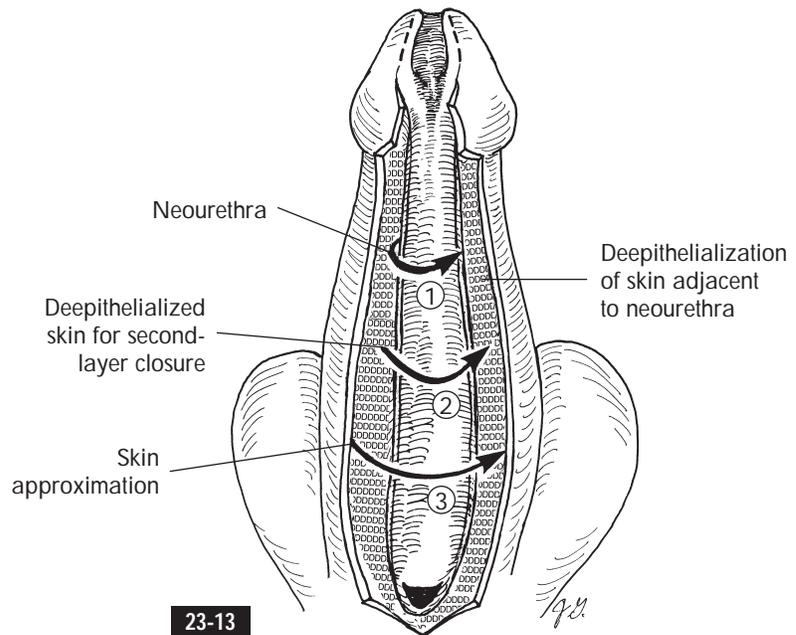
A neourethra was reconstructed (1), and the adjacent deepithelialized dermis was approximated as a second-layer closure (2). The compressive effect of this second layer is important in that it prevents the possible formation of a

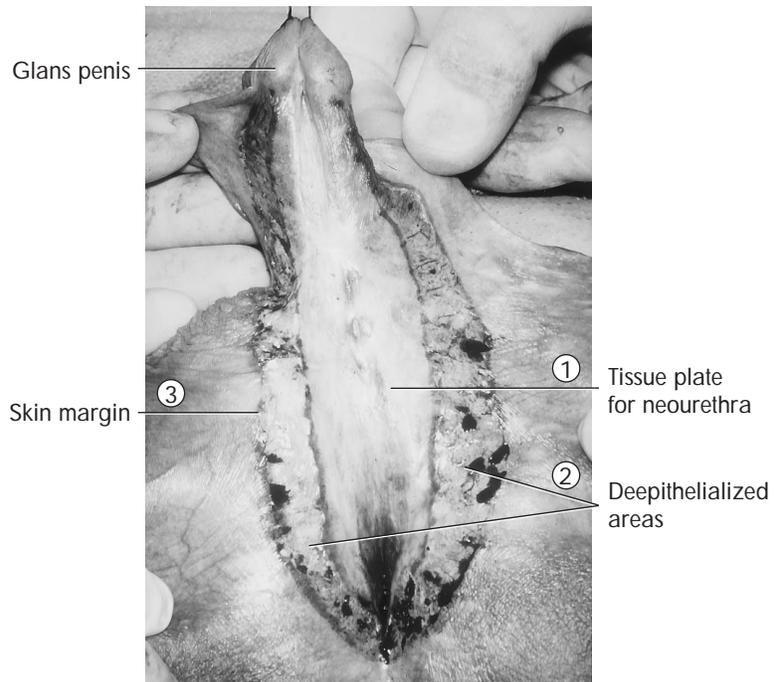
dead space and concomitant fluid collection.

Since *undermining* was not performed on either the skin adjacent to the neourethra or the lateral skin, the vasculature and lymphatics were intact. In contrast, undermined skin is used to cover the penis in Quartey's method⁵ of urethroplasty (see Fig. 23-10), which thus introduces the risk of devascularization.

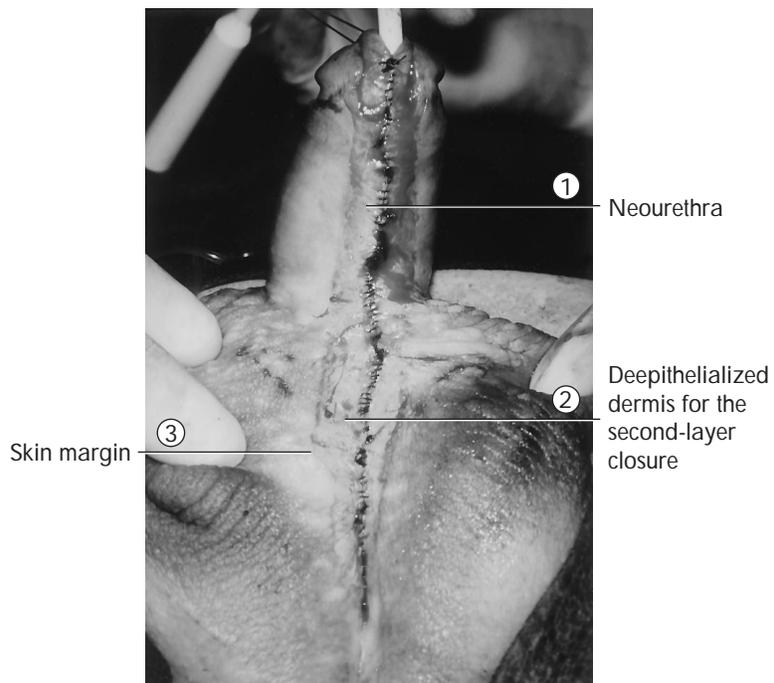
The skin edges were reapproximated (3), and a suprapubic tube and a Silastic stent with open trough were placed for urinary and secretory diversion.⁶

Delayed Second-Stage Urethroplasty Closure with Deepithelialization





23-14



23-15

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SUGGESTED READINGS

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