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CASE REPORT
Reconstructive

Successful Second Microsurgical Replantation for Amputated Penis

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Summary: Penile amputation is a rare emergency, but the best method for its repair is required due to the organ's functional and societal role. Since the first successful microsurgical replantation of the amputated penis, microsurgical techniques have matured and become the standard treatment for the penile replantation. However, the successful second microsurgical replantation for amputated penis has been rarely reported. We present the case of a 40-year-old man with schizophrenia who had a past history of penile self-mutilation and successful replantation at another hospital 2 years ago. After stopping oral medication for schizophrenia, he again cut his penis with a kitchen knife. We successfully replanted the amputated penis by anastomosing both circumflex arteries, the superficial dorsal vein, and the deep dorsal vein using microsurgical techniques. Postoperatively, the foreskin of the replanted penis gradually developed partial necrosis, requiring surgical debridement. The aesthetic and functional results were satisfactory and retrograde urethrography showed no evidence of leakage and stricture of the urethra. Although skin necrosis after penile replantation has been reported as an unavoidable process owing to the nature of injury, the rate would be higher after secondary replantation because of scar formation due to the previous operation. Therefore, our case of successful secondary replantation suggests that skin necrosis would be a predictable postoperative complication and the debridement timing of the devitalized foreskin should be closely monitored, and also secondary amputation is not a contraindication of replantation. *(Plast Reconstr Surg Glob Open 2017;5:e1512; doi: 10.1097/GOX.0000000000001512; Published online 22 September 2017.)*

Penile amputation is a rare emergency that can occur after circumcision, accidental trauma, self-mutilation, and attacks by spouses in retaliation for unfaithfulness. Of these, the majority of penile amputations in adults are caused by self-mutilation.[1,2] Since the first successful microsurgical replantation of an amputated penis in 1977,[3,4] several cases in which the microsurgical technique was used have shown good functional outcomes including the presence of erections, ejaculation, and sensation, as well as normal urine flow. Consequently, microsurgical replantation has become the standard treatment for penile amputation.

However, to our knowledge, there is only 1 reported case of a patient who performed self-mutilation twice and received successful penile replantation.[5] In this article, we present a case of successful microsurgical replantation after a secondary self-mutilation in a patient with schizophrenia and also discuss the surgical pitfalls and postoperative complications for a secondary penile replantation.

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CASE REPORT

A 40-year-old man with a hebephrenic schizophrenia had a history of self-mutilation of his penis and successful replantation at another hospital 2 years ago. However, he discontinued his oral medication for schizophrenia and subsequently suffered auditory hallucinations compelling him to amputate his penis. Two months after stopping oral medication, he again cut his penis with a kitchen knife 5 mm distal from the mons pubis and 15 mm proximal to the first cut. Because of diffuse bleeding from the stump, electrocoagulation was performed for hemostasis at the previous hospital. The patient was then referred to our hospital for penile replantation 3 hours after the amputation (Fig. 1).

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Fig. 1. Preoperative appearance of penile amputation.

Fig. 2. Microvascular penile replantation in the present case. Green arrow indicates anastomosed arteries.

Under general anesthesia, the amputated penis was carefully examined using a microscope to identify and tag the neurovascular structures. A superficial dorsal vein, a deep dorsal vein, and both dorsal nerves were easily identified and considered suitable for repair. However, both dorsal arteries medial to the dorsal nerves could not be identified because of a scar formation of the previous operation. Furthermore, both cavernosal arteries were not suitable for repair because they were electrocoagulated. However, both thin circumflex arteries were identified lateral to the dorsal nerves, and we tried to anastomose them to restore the penis' arterial blood supply. A 16-Fr Foley catheter was placed through the amputated penis and the stump, and the urethra was repaired by end-to-end anastomosis over the catheter. Next, the tunica albuginea of corpora cavernosa and corpora spongiosa were repaired. Once the penile body was reattached, microvascular end-to-end anastomoses were performed for both the circumflex arteries, the superficial dorsal vein, and the deep dorsal vein. One of the circumflex arteries and superficial dorsal vein were anastomosed with 15 mm and 10 mm vein grafts harvested from the dorsum of the foot, respectively. Both the dorsal nerves were sutured. The vascularity was eventually reestablished 11 hours following the amputation (Fig. 2). Finally, the Buck's fascia and skin were closed. A bulky but noncompressive dressing was applied, and the replanted penis was secured in an elevated position to prevent a microvascular compromise by extending the anastomotic sites.

Postoperatively, the foreskin of the replanted penis became markedly edematous, and the skin gradually developed necrosis 20 mm distal to the replanted site (Fig. 3), requiring debridement of the devitalized skin and resuture on postoperative day 9. Subsequently, wound healing occurred without further problems. A retrograde urethrography performed 2 months after the replantation showed no evidence of leakage and stricture of the urethra. After 9 months of follow-up, he seemed to be content with the appearance of his penis (Fig. 4) and reported effective erectile function and good urinary pattern. He initially presented with glans numbness, but it has been slowly improving with time.

Fig. 3. The early postoperative appearance of the replanted penis showing skin necrosis and wound dehiscence.

Fig. 4. Good appearance of the replanted penis shown on follow-up at 9 months.

DISCUSSION

The standard method of vascular reconstruction for an adequate perfusion in penile replantation has not been well established. Previous reports suggested that a critical factor for a successful replantation is the

adequacy of venous outflow and the superficial and deep dorsal veins play an important role.[6,7] In the present case, identification and anastomosis of the superficial and deep dorsal veins were not so difficult due to their large diameter. However, the most difficult issue in this replantation was the reconstruction of arteries. Previous reports suggested that the dorsal arteries should be repaired whenever possible because the glans is perfused solely by the dorsal artery, and failure to use the dorsal artery system would likely result in a distal necrosis.[2,6,8] In our present case, it was impossible to identify both dorsal arteries. As a result, the circumflex arteries that are the lateral branches of dorsal arteries were identified lateral to both dorsal nerves and anastomosed to restore the arterial blood supply. The use of circumflex arteries for penile replantation has not been reported, and their usefulness and feasibility remain unclear. Naturally, the dorsal artery should be the first choice for arterial anastomosis, but arteries other than dorsal artery can be possibly used with careful identification and anastomosis in secondary penile replantation.

Skin necrosis is the most common complication after penile replantation in approximately half of all cases.[2] Previous reports suggested that potential causes of skin necrosis include ischemic time, postoperative edema, and congestion,[1,6] but there are no statistical data to support them. However, in a cadaveric anatomical study, Tuffaha et al.[8,9] reported that the skin covering most of the shaft is perfused only by the external pudendal artery, which is found in the groin and extensively branches before reaching the penis, making it improbable to find a repairable vessel at the amputation site. Therefore, postoperative skin necrosis would be a predictable complication after penile replantation.[9] The rate of skin necrosis would be higher in secondary replantation because of scar formation due to the previous operation, in addition to the lack of perfusion. Therefore, we suggest that the debridement timing of the foreskin of a replanted penis should be closely monitored postoperatively in secondary replantation.

CONCLUSIONS

We present a case of successful second microsurgical replantation for an amputated penis suggesting that secondary amputation is not a contraindication for replantation. However, skin necrosis would be a predictable complication, for which the postoperative debridement timing of devitalized foreskin should be closely monitored.

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