



Microsurgical Penile Replantation after Self-inflicted Amputation in a Schizophrenic Patient: 5-year Follow-up

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Summary: In this article, we report on the long-term follow-up of a microvascular penile replantation resulting from self-inflicted amputation in a schizophrenic patient. An interdisciplinary approach with the involvement of urology, plastic surgery, endocrinology, and psychiatry is imperative for optimal treatment of these catastrophic injuries. (*Plast Reconstr Surg Glob Open* 2015;3:e319; doi: 10.1097/GOX.000000000000172; Published online 6 March 2015.)

Penile amputation is a rare urologic emergency that can occur as a result of circumcision, felonious assault, accidental trauma, and self-mutilation.¹ In this article, we report on the long-term follow-up of a microvascular penile replantation resulting from self-inflicted amputation in a schizophrenic patient.

CASE REPORT

Mr. C. was a 19-year-old gentleman who 3 hours before arriving at Denver Health Level I Trauma Center had performed self-mutilating wounds to his genitalia, wrists, and neck. The penis and both of the

testicles had been amputated. The emergency team on site was able to retrieve his distal penis and deliver it to the hospital. Given the nature of the injury and urgency of repair, an informed consent was obtained from the patient's parents.

The back table was set up to assess the amputated penis and his testes for replantation. His amputated testes were deemed not replantable secondary to multiple segmental injuries. The penile amputation was at the midshaft level, and the edges were sharp and clean (Fig. 1). Both dorsal penile arteries, deep dorsal and 2 superficial veins, and both dorsal sensory nerves were identified on the amputated penis. The urology service placed a tourniquet using a Penrose drain at the base of the penis to assist with hemorrhage from the corporal cavernosal bodies, which then facilitated the identification of the neurovascular structures in the stump (Fig. 2). Bilateral cord structures and the blood vessels for the vas deferens were also ligated. The scrotal injury was repaired along with the evacuation of a hematoma and placement of a suction drain. The proximal end of the urethral mucosa was spatulated on the ventral surface. Next, the spatulated urethral mucosa was reapproximated using a 5-0 polydioxanone suture (Ethicon US, LLC) suture over a 16-F Foley catheter (Brad Medical, Covington, Ga.).

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Fig. 1. Self-inflicted penile amputation at the midshaft level.

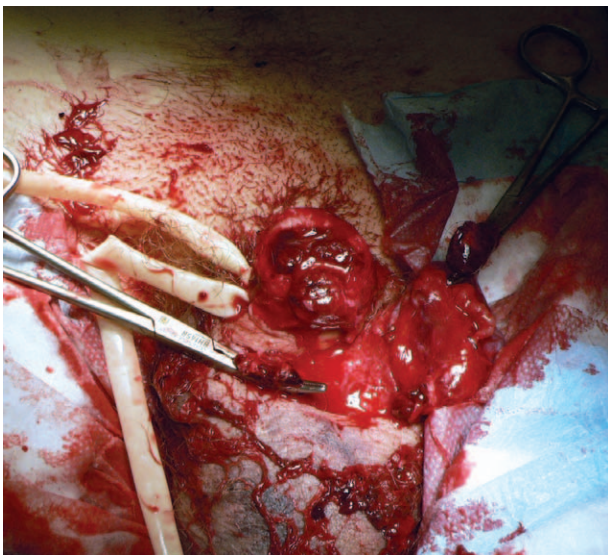


Fig. 2. The penile amputation stump. A Penrose drain was placed at its base to assist with hemorrhage control and identification of the neurovascular structures.

The outer layer of the corpora spongiosum/cavernosum and the midline septum were repaired with a 4-0 PDS suture in a running layer.

Once the penile body was reattached, the revascularization surgery was initiated. The patient was given 5000 U of intravenous heparin, which was allowed adequate time to circulate. End-to-end microvascular anastomoses were performed for the right and left sided dorsal arteries using 10-0 nylon sutures. Venous return was noted after the arterial inflow was established. Venous outflow was allowed to drain the distal penis until each venous anastomosis was completed. One deep and 2 superficial dorsal veins were anas-

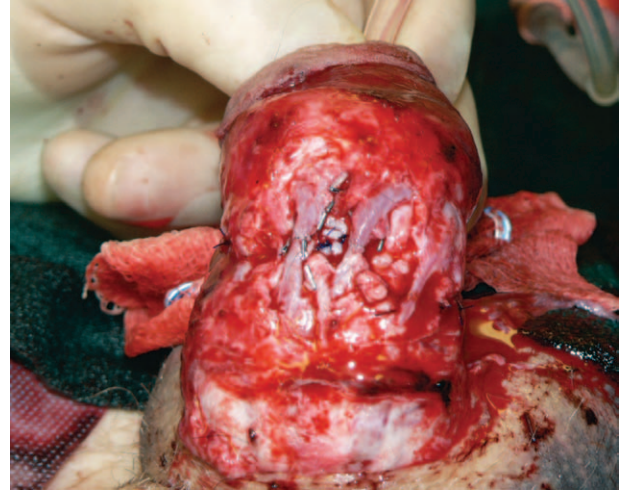


Fig. 3. Microvascular penile replantation.

tomosed using 9-0 nylon sutures (Ethicon US, LLC) (Fig. 3). Tension for the anastomosis was removed by approximating the Buck's fascia using 4-0 Vicryl sutures. Epineural repair was performed for both dorsal sensory nerves using interrupted 10-0 nylon sutures. The penile skin was stitched using loosely approximating 5-0 nylon sutures. A prick test of the glans revealed bright red bleeding. A simple closure of 2 volar forearm and 1 neck lacerations was performed. The patient received both fresh frozen plasma and packed red cell transfusion along with crystalloid. Cephalosporin antibiotics were administered before the incision as well as during the case at intervals.

The patient was transferred to the intensive care unit where he stayed ventilated overnight and sedated for control, because there was the possibility of him becoming agitated and destroying the anastomosis (Fig. 4). On day 7, the patient was brought to the operating room for a minor sharp debridement of a small area of devitalized skin involving an area at the junction of the distal penile shaft and the glans skin. Three days later, he received thick split-thickness skin grafting (1.5×3.0 cm) to his penile wound, which thereafter completely healed. Retrograde urethrography performed at 4 weeks showed no evidence of leak, and the Foley catheter was removed. Patient was discharged from the hospital at about 6 weeks.

During initial hospitalization, the patient was treated for his acute psychotic episode and closely monitored by psychiatric service. Later on, he received an ongoing psychiatric counseling and treatment for schizophrenia. He has been taking oral olanzapine (antipsychotic medicine) 10mg/day for the past 5 years.

Follow-up evaluations were performed vigilantly in both urology and plastic surgery clinics at 3- to 6-month intervals. Patient reported the following data at each clinic visit: erogenous sensation, sensory recov-



Fig. 4. Day 2 after replantation.

ery, erection length and size, orgasm at masturbation and intercourse, and urination strength were assessed and recorded. The patient stated experiencing infrequent nocturnal penile tumescence as early as 8 weeks. After the replantation, he reported masturbating for the first time at about 6 months and first experienced sexual intercourse at about 14 months. The patient has reported gradual and continuous improvement in sensation, firmness of erection, as well as frequency of masturbation and intercourse over the subsequent 4 years. Table 1 summarizes patient reported data at the fifth year of follow-up. He was very pleased with the outcome of the penile replantation considering his adequate sexual and urologic functions. (See **Figure, Supplemental Digital Content 1**, which shows the patient at the fifth year after penile transplantation; note that the skin graft placed over the distal and dorsal aspects of the replanted penile shaft has expanded over time, <http://links.lww.com/PRSGO/A50>.) (See **Video, Supplemental Digital Content 2**, which demonstrates patient's micturition function at 5 years post-replantation. This video is available in the "Related Videos" section of the Full-Text article on PRSGO.com or available at <http://links.lww.com/PRSGO/A51>.) The patient has been undergoing testosterone replacement ther-

Table 1. Comparison of the Postreplantation Parameters with Those of the Preamputation State

Patient Reported Data at 5-y Follow-up	Preamputation	Postreplantation
Overall sensation	10	8
Erogenous sensation	10	8
Orgasm at masturbation	10	9
Orgasm at intercourse	10	7
Penile length at erection	10	8
Strength at urination	10	9

Patient was asked to score in all the parameters on a scale of 1 to 10 at 5 years postreplantation for comparison with his preamputation status.



Video 1. See video, Supplemental Digital Content 2, which demonstrates patient's micturition function at 5 years postreplantation. This video is available in the "Related Videos" section of the Full-Text article on PRSGO.com or available at <http://links.lww.com/PRSGO/A51>.

apy to supplement secondary male features, sex drive, energy, and lean muscle.

DISCUSSION

Self-inflicted penile amputation is an uncommon urologic and psychiatric emergency that requires resuscitation, immediate surgical intervention, and acute management of the patient with particular attention to underlying psychiatric illness. Involvement of multiple services in a timely manner is critically important for a successful outcome.

Penile reconstruction following amputation remains one of plastic surgery's greatest challenges because of the inherent complexity of restoring both the anatomical form and sexual and urologic functions of the penis.²⁻⁴ Variable outcomes have been reported using nonmicrosurgical methods with the distal amputated part as a composite graft leading to high complication rates of skin necrosis, fistula formation, loss of sensations, and erectile dysfunction.⁵ Therefore, if possible, every attempt should be made to consider microsurgical penile replantation at the first encounter.

In our case, the arterial inflow was successfully established through the dorsal penile arteries (branches of the internal pudendal artery that originate from the internal iliac artery). A minor skin necrosis was observed and may be associated with the lack of adequate perfusion through the external pudendal vessels.^{6,7} Therefore, it may be advisable to anastomose the superficial system to avoid the potential risk of skin necrosis. A critical factor for the success of replantation was the adequacy of venous outflow and the sequence of microsurgical anastomosis. Due to the dual venous drainage in the penis, the superficial and deep dorsal veins, tributaries of saphenous

and santorini plexus, respectively, were both anastomosed for sufficient venous return.

Overall, cases of microsurgical penile replantation following self-amputation are extremely rare. Additionally, long-term outcome data on sexual and micturition functions in patients who have undergone microvascular replantation are scarce. Therefore, long-term follow-ups are extremely important to assess the functional outcome.

We have established a great rapport with the patient that allowed us to monitor his progress and retrieve information in this very sensitive situation. The patient-reported data demonstrated restoration of about 80% of the preamputation state at the fifth year of follow-up. Although there is no guarantee that each and every microsurgical attempt will yield a successful outcome, the long-term findings in our patient support that microsurgical replantation should be considered as the first line of treatment.⁸ An interdisciplinary approach with the involvement of urology, plastic surgery, endocrinology, and psychiatry is imperative for optimal treatment of these catastrophic injuries resulting from self-mutilation.

SUMMARY

In this article, we report on the long-term follow-up of a microvascular penile replantation resulting from self-inflicted amputation in a schizophrenic patient.

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