

Reconstruction of an Incompletely Amputated Penis with The Radical Penile Crural Dissection and Radial Forearm Free Flap

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INTRODUCTION

Penile amputation is a rare injury that occurs most frequently because of self-mutilation in patients suffering from psychotic problems, especially schizophrenia. Less frequent reasons for penile amputation are non-self-mutilation, trauma due to an industrial or traffic accident, incidents during circumcision, hypospadias repair or surgery for bladder extrophy, surgical resection for malignancy, strangulation by hair coil, and penetrating injuries during war. Surgical techniques for penile reconstruction continue to evolve. However, because of the complexity of the penis, repairing and reconstructing this organ remains a great challenge for surgeons, anatomically, functionally, and aesthetically.

Treatment and care vary depending on the severity of the lesions, the delay in seeking consultation, and the patient's mental state. The goal of penile reconstruction is to restore urinary and sexual functions with cosmetically acceptable results. Ideally, surgical repair should be immediate, to preserve as much viable tissue as possible. This is because no other tissue in the body has the characteristics, in terms of elasticity, texture, and color, to be considered an ideal candidate for genital reconstruction. For penile amputation, microvascular replantation can be preferred as one of the treatments⁽¹⁾. When primary repair with genital tissue is not feasible, skin grafts and various pedicle and free flaps can be used for reconstruction.

We report a case of criminal penile amputation that was restored by radical penile crural dissection and use of a radial forearm free flap (RFFF) to cover the corpus cavernosum.

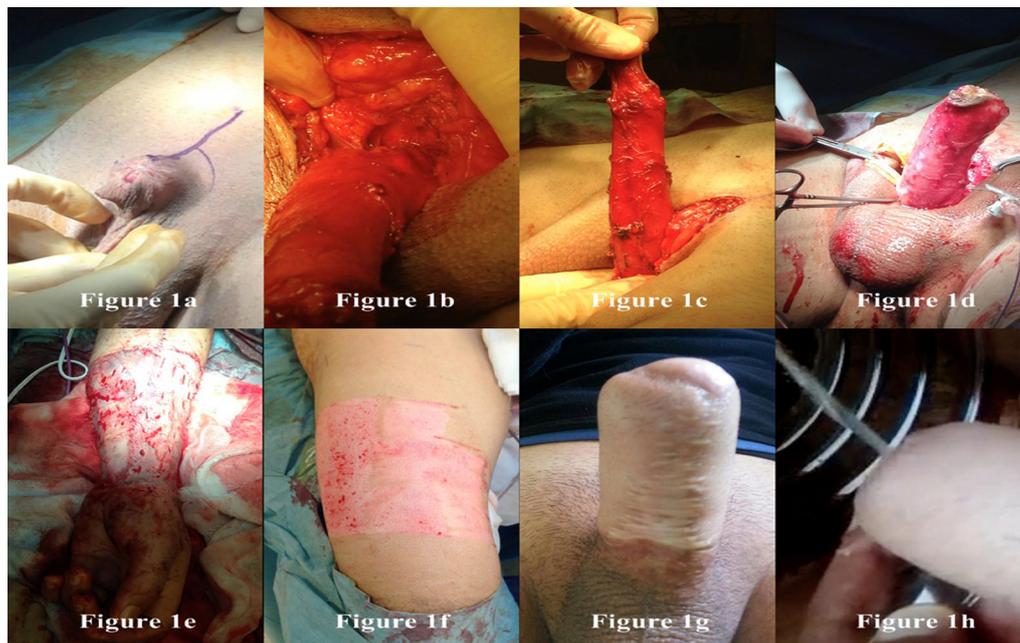


Figure 1. 1a: Incomplete amputation of penis; 1b: The release of penile suspensory ligament and the appearance of pubic junction; 1c: Flaccid (soft) cavernosal tissue; 1d: Artificial erection and the appearance of long cavernosal tissue; 1e: Forearm closed by a split thickness skin graft; 1f: A right thigh split thickness skin graft donor site; 1g: Penile erection (Postoperative 6th month); 1h: A good urinary flow with an orthotopic urethral opening.

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CASE REPORT

A 30-year-old man suffered from incomplete criminal amputation of the penis, approximately 2 cm distal from the mons pubis (**Figure 1a**). The victim stopped the bleeding by applying pressure on the penile root and was rescued 3 days after the incident occurred. The cut part of the penis was abolished by the offender.

The victim was admitted to an external center and cystostomy was applied immediately. The planned penile reconstruction was delayed because of urethral and perineal edema, and ecchymosis. Eight months later, the patient was referred to our clinic. A urological examination revealed a 2-cm penile stump with a closed distal tip and palpable, long, proximal crural tissue. The scrotum and testicles were intact. Perineal edema and ecchymosis were resolved, allowing for reconstructive surgery.

Radical penile crural dissection and the use of a RFFF to cover the corpus cavernosum were planned. The proximal part of the remaining penis was dissected. The crus of the penis was dissected and the penile suspensory ligament was released (**Figure 1b**). After radical dissection, the flaccid (soft) length was increased and the artificial erection length was 12 cm (**Figure 1c, d**). The RFFF was taken from the left arm and transferred to the penile stump. The deep inferior epigastric artery and vein were mobilized and transferred from the inguinal channel to the penile stump. Only one end-to-end arterial anastomosis was performed between the radial artery and deep inferior epigastric artery. The radial vein was anastomosed with the deep inferior epigastric vein. Neuroorrhaphies were performed between the lateral antebrachial cutaneous nerve and the dorsal nerves of the penis. The free radial forearm flap dimension was 10x8 cm. Microsurgeon (E.G) have done the microsurgical arterial anastomosis with 8/0 ethilon and venous anastomosis with 9/0 ethilon. Neuroorrhaphies have done with 9/0 ethilon as well. The flap area was covered with a split thickness skin graft from the right thigh (**Figure 1e, f**). There was moderate blood loss and we did not need any blood transfusion for the patient. Operation was finished in 6.5 hours. Low-dose aspirin and antibiotics were administered postoperatively for 1 week. The urethral catheter was removed at 2 weeks and a trial of micturition was performed.

A successful cosmetic result was accompanied by an acceptable speed of micturition while standing and spontaneous erections, resulting in successful sexual intercourse (**Figure 1g, h**). We planned to perform the second stage of surgery for glans reconstruction, but the patient did not want to undergo a second surgery. Penile sensation was intact on follow up. Two discrimination tests showed good results at a 6-month follow-up.

DISCUSSION

Management of penile amputation varies according to the case upon arrival of emergency services. If the amputated penis tissue is available for surgery, microsurgical replantation should be rapidly applied. Phalloplasty is required if replantation cannot be performed. The purpose of reconstructive surgery is to achieve a satisfactory result involving aesthetics and functional use. Phallic reconstruction was first described by Bogoras in 1936⁽²⁾. Chang et al. performed the first successful

RFFF phalloplasty in 1984⁽³⁾. Subsequently, the RFFF technique became the gold standard treatment for penile reconstruction.

An RFFF was planned in our case because replantation was not an option. During the operation, only an RFFF was used because an adequate length of the penis was obtained by radical dissection. In this phalloplasty technique, several serious complications have been reported, including urethral anastomosis and circulatory system disorders⁽⁴⁾. In addition, penile prosthesis implantation is required for correcting erection problems. After urethral anastomosis, the appearance of a urethral fistula frequently occurs and re-operation is required (22–68% of cases)⁽⁴⁾. After the penile prosthesis implantation, the rate of re-operation is 25%⁽⁵⁾.

In the present case, a perfect erection and good continence were obtained after radical penile crural dissection and use of the RFFF to cover the corpus cavernosum. This procedure is less challenging than performing a total penile reconstruction including the urethra. There are no similar cases in the literature. If a replantation procedure is not possible, a sufficient length of penis can be obtained via radical dissection within the reconstruction⁽⁶⁾. With this technique, potential complications relating to urethral anastomosis and penile prosthesis implantation can be avoided. Before the reconstruction process, we can determine whether the length of the penis is adequate with a good physical examination and inducement of an artificial erection. A similar reconstruction process should be considered in future cases to increase the success of surgical repair and decrease the rate of complications.

CONCLUSIONS

We believe that radical penile crural dissection and an RFFF are good options for an incompletely amputated penis when penile crural length is acceptable. This is an easy and safe procedure that provides acceptable cosmetic results. Additionally, urinary flow is good with an orthotopic urethral opening and normal erectile function. Innervation using an RFFF provides improved sensation to the reconstructed penis.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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