

Penile Reconstruction after Extensive Excision of Sclerosing Lipogranuloma: How to Make the Shape of Scrotum, Penile Shaft and Suprapubic Region with a Rectangular Radial Forearm Free Flap

Tae Gon Kim*, Su Won Hur, Yong-Ha Kim, Jun Ho Lee, Ki Hak Mun¹

*Departments of Plastic and Reconstructive Surgery and
¹Urology, Yeungnam University College of Medicine, Daegu, Korea*

Received February 26, 2015

Revised March 17, 2015

Accepted March 24, 2015

*Correspondence to: Tae Gon Kim
Department of Plastic and Reconstructive
Surgery, Yeungnam University College of
Medicine, 170 Hyeonchung-ro, Nam-gu,
Daegu 705-717, Korea
Tel: +82-53-620-3483
Fax: +82-53-626-0705
E-mail: kimtg0919@hanmail.net

Financial support: None.

Conflict of interest: None.

The authors had five cases of penoplasty from more than half of the scrotum to the suprapubic region using a fasciocutaneous radial forearm free flap (RFFF) after extensive excision of sclerosing lipogranuloma. Although the harvested RFFF was a rectangular shape, the authors made the shape of scrotum, penile shaft, and suprapubic region by using well designed geometry and several quilting sutures on junction of scrotum and penis. The contour of scrotum and penis was well maintained, and there were no complications, such as scrotal contracture, penile deformity, and erectile dysfunction during the one year follow up period in all five cases. There were no recurrent lesions and no need for further surgery.

Key Words: Free tissue flaps, Penis, Foreign-body reaction, Granuloma

Sclerosing lipogranuloma of the penis is an uncommon disease produced by paraffin or silicone injections for the purpose of penile augmentation by a nonmedical person. The treatment of choice should be complete excision and appropriate penoplasty.¹ Various repair techniques, including primary closure, skin grafts, and scrotal or groin flaps have been introduced. However, in extensive penile lipogranuloma involving more than half of the scrotum and the suprapubic area, it is difficult to sufficiently cover the defects by using those options without the possibility of scrotal contracture or penile shortening.²⁻⁴ For this reason, the fasciocutaneous radial forearm free flap (RFFF) has been introduced a reliable option for its excellent pliability, thinness, a long and high-caliber vascular pedicle.^{5,6} However, the question remains how to make a shape of scrotum, penile shaft, and suprapubic

region naturally with this rectangular-shaped RFFF. Herein, we present the geometric design for penoplasty and postoperative results of our five cases.

CASE REPORT

A 46-year-old circumcised man who had a subcutaneous injection of liquid paraffin eighteen months ago visited our hospital with painful penile swelling. Several solid granuloma were palpable and a 12×8 cm² sized amorphous skin change affected from more than half of the scrotum to the suprapubic region. The diagnosis was a sclerosing lipogranuloma (clinically paraffinoma) with a history of the paraffin injection and the histologic examination. The authors performed a complete removal of the paraffinoma, including involved skin and

subcutaneous tissue. The mass did not penetrate the corpus cavernosum and was located outside of Buck's fascia. As the remnant scrotal skin, despite of its good resilience, was not plentiful to cover the defect and there were high possibility of scrotal contracture or penile shortening, the authors planned to use a RFFF for the penile reconstruction instead of a scrotal flap.

Surgical methods

The authors measured the horizontal and vertical length of defect and designed the flap as a rectangular shape on left forearm. Before raising the flap, the authors identified the left superficial external pudendal vessels with Doppler and

dissected these as recipient vessels. The distance from recipient vessels to center of the defect was measured to estimate the required pedicle length. Then, the RFFF was elevated in a subfascial plane from the volar region of the forearm, and the radial artery and its vena comitantes were preserved as flap pedicle. The flap was set on the suprapubic region and its pedicles were passed through the tunnel to recipient vessels. One end-to-side anastomosis of arteries and two end-to-end anastomoses of veins were performed. After microvascular anastomoses, the raw surface from scrotum to suprapubic region was surrounded by the rectangular-shaped flap.

The geometric design for scrotum, penile shaft, and

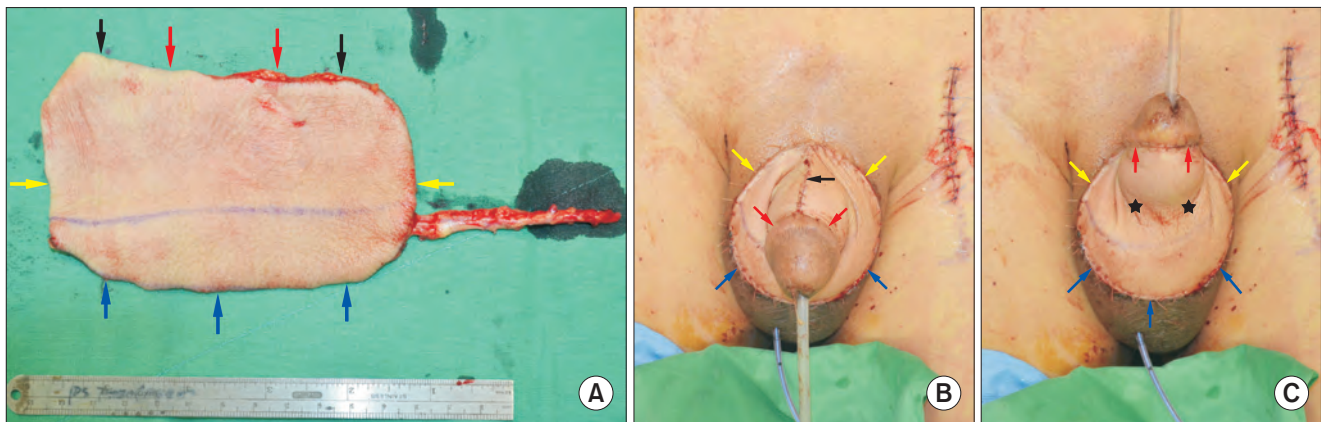


Fig. 1. Intraoperative and immediate postoperative view of case 1. (A) Geometric design for penoplasty with a rectangular-shaped radial forearm free flap (RFFF). The flap size was about 12×8 cm² and the pedicle length was 15 cm. (B) The lower horizontal edge of flap met the margin of remnant scrotum (blue arrows) and both vertical edges of flap met the margin of remnant suprapubic region (yellow arrows). Both lateral quarters of upper edge of flap met at the suture line on the dorsal side of penile shaft (black arrows) and both medial quarters of upper edge of flap met the margin of glans penis (red arrows). (C) Two quilting sutures (black stars) were done on the junction of scrotum and penis at 5 and 7 o'clock positions for retaining the distinct fold between the penis and scrotum.

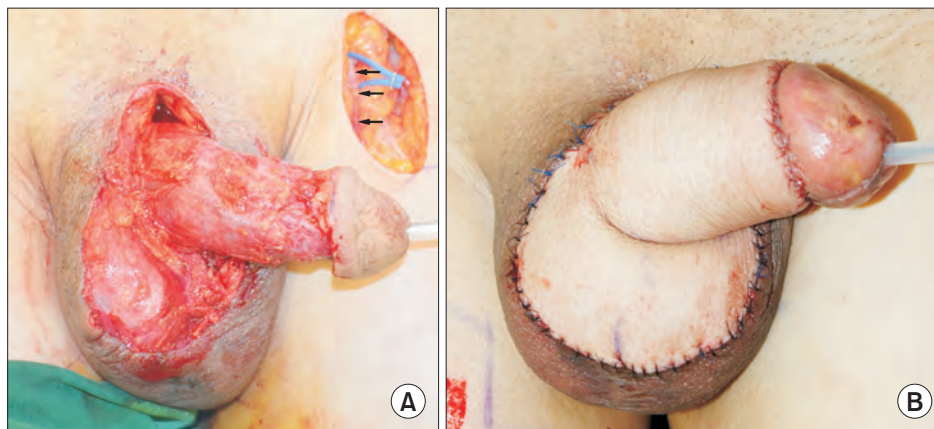


Fig. 2. Intraoperative and immediate postoperative view of case 2. (A) Denuded penis after extensive excision of penile lipogranuloma. The left superficial external pudendal vessels (black arrows) were used for the recipient vessels. (B) Immediately postoperative view.

suprapubic region with a rectangle RFFF involved the following steps (Fig. 1, 2): First, the lower horizontal edge of flap was sutured to the margin of remnant scrotum. A closed drain was inserted through the lower portion of the scrotum, and, then, two quilting sutures were done on the junction of scrotum and penis at 5 and 7 o'clock positions for retaining the shape of scrotum and penile shaft. A round needle (5-0 Vicryl) was used to pass through the fat layer of flap and then passed through the Buck's fascia in such a manner that a distinct fold between the penis and scrotum would be detected. If the flap tension was too high due to tightened quilting sutures, a proper release was required to prevent any difficulty with flap circulation. Next, both vertical edges of flap were sutured to the margin of remnant suprapubic region and consequentially both upper vertices of rectangular flap met together in midline of the suprapubic region. After that, both lateral quarters of upper edge of flap met at the suture line, which was positioned on the dorsal side of penile shaft, and fixed with a cutting needle (5-0 Vicryl). Lastly, both medial quarters of the upper edge of flap were sutured to the margin of glans penis and the fixation of flap was finished.

DISCUSSION

To achieve a definitive treatment for a sclerosing lipogranuloma, a complete and radical excision was necessary to remove the foreign material; otherwise, a recurrence of symptoms may occur.^{7,8} After then, there remained the issue of how to handle the skin defect. Various methods, including primary closure,

skin grafts, and scrotal or groin flaps had been introduced, and each method have their own advantages and disadvantages.^{8,9} However, when the skin defect is extensively wide, from more than half of the scrotum to the suprapubic area, these options are challengeable to cover the defects sufficiently in one stage without the possibility of scrotal contracture or penile shortening.⁴ The fasciocutaneous RFFF has been introduced as a good alternative method when a scrotal flap is not available. Advantages of this flap include a long vascular pedicle, abundant vascularity, excellent pliability, and less hair. Additionally, it has a thin subcutaneous tissue compared to an anterolateral thigh free flap, which has bulky nature, and could be difficult for vaginal penetration in sexual intercourse.^{2,3,5,6,10}

Although the penoplasty using the fasciocutaneous RFFF after extensive excision of sclerosing lipogranuloma was reported previously, there was no description about the method for making a shape of scrotum, penile shaft, and suprapubic region with a rectangular RFFF.^{2,3} In our report, we reported five cases of penoplasty with a RFFF and described the method with geometric design for penoplasty (Table 1). The contour of scrotum and penile shaft was well maintained, and there were no complications, such as scrotal contracture, penile shortening, deformity, and erectile dysfunction during the one year follow-up period in all five cases (Fig. 3). The only drawback of what the patient complained was the unpleasant appearance of the donor site covered by a thin split thickness skin graft. There was no evidence of recurrent lesions and no need for further surgery due to complications. However, the limitation is that

Table 1. Five cases of penoplasty using a rectangular radial forearm free flap after complete excision of extensive sclerosing lipogranuloma*

No.	Age (yr)	Time from injection (mo)	Affected size (cm ²)	Injection material	Involvement range	Symptoms	Complication
1	46	18	12×8	Liquid paraffin	More than half of scrotum, penile shaft, suprapubic area	Painful swelling, multiple hard mass, rigid penile skin	Minor skin necrosis of donor site
2	52	24	12×10	Liquid paraffin	More than half of scrotum, penile shaft, suprapubic area	Painful erection, voiding difficulty, multiple hard mass	-
3	41	34	14×11	Liquid silicone	More than half of scrotum, penile shaft, suprapubic area	Fistula, painful swelling, multiple hard mass	-
4	59	26	13×9	Liquid paraffin	More than half of scrotum, penile shaft, suprapubic area	Painful swelling, necrotized skin	-
5	57	2	10×7	Liquid silicone	Half of scrotum, penile shaft, suprapubic area	Purulent ulceration, fistula, necrotized skin	Minor skin necrosis of donor site

*Penoplasty: free radial forearm flap.

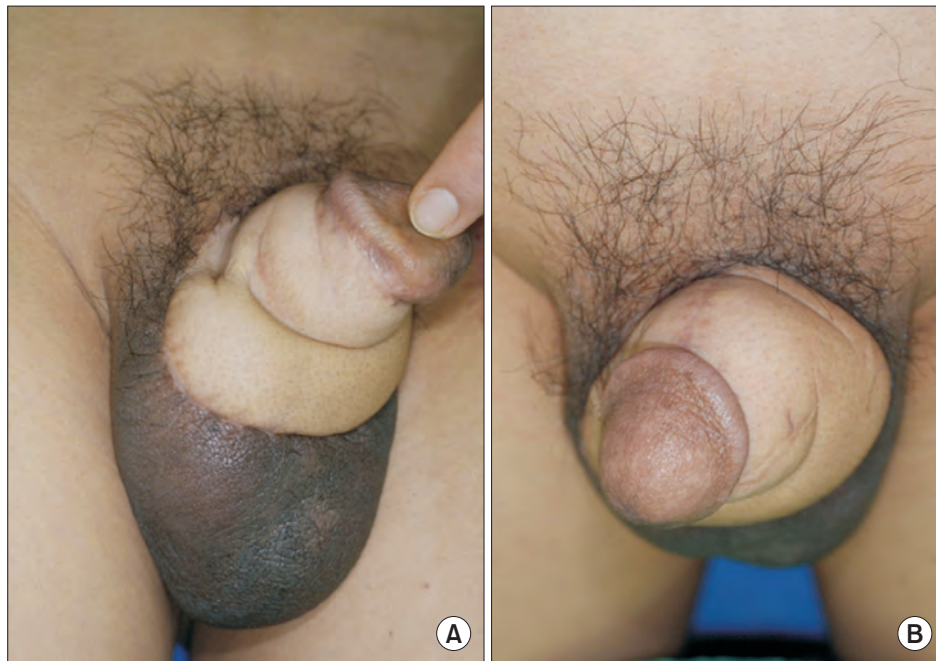


Fig. 3. Postoperative view after 1 year of case 1. The postoperative results were aesthetically acceptable in penile contour and bulkiness. The patient was able to recover his sexual function and to achieve a normal sexual intercourse within 3 months. (A) Three-quarters view. (B) Bird's-eye view.

we didn't perform sensated RFFF. Next time, we will attempt to anastomose end-to-end with the dorsal nerve of the penis and the lateral antebrachial cutaneous nerve.

ACKNOWLEDGEMENTS

This article was presented as poster at the 4th Research and Reconstructive Forum on Apr 3~4, 2014 in Busan, Republic of Korea.

REFERENCES

1. Nyirády P, Kelemen Z, Kiss A, Bánfi G, Borka K, Romics I. Treatment and outcome of vaseline-induced sclerosing lipogranuloma of the penis. *Urology* 2008;71:1132-7.
2. Yoon JS, Park CH, Choi DW. Extensive penis paraffinoma: treatment by penoplasty using various scrotal flaps and radial forearm free flap. *Korean J Androl* 1999;17:51-6.
3. An JT, Cho ST, Park CH, Ihm JK, Kim HY, Kim KK, et al. Penoplasty with a sensate radial forearm free flap after removal of paraffinoma. *Korean J Urol* 2002;43:183-5.
4. Scholten E, Nanhekhan LV, Oudit D, Hage JJ. Scrotal and penile reconstruction after massive self-injection of liquid paraffin and petroleum jelly. *Plast Reconstr Surg* 2005;115:2168-9.
5. Monstrey S, Hoebeke P, Selvaggi G, Ceulemans P, Van Landuyt K, Blondeel P, et al. Penile reconstruction: is the radial forearm flap really the standard technique? *Plast Reconstr Surg* 2009;124:510-8.
6. Camaioni A, Loreti A, Damiani V, Bellioni M, Passali FM, Viti C. Anterolateral thigh cutaneous flap vs. radial forearm free-flap in oral and oropharyngeal reconstruction: an analysis of 48 flaps. *Acta Otorhinolaryngol Ital* 2008;28:7-12.
7. Di Benedetto G, Pierangeli M, Scalise A, Bertani A. Paraffin oil injection in the body: an obsolete and destructive procedure. *Ann Plast Surg* 2002;49:391-6.
8. Jeong JH, Shin HJ, Woo SH, Seul JH. A new repair technique for penile paraffinoma: bilateral scrotal flaps. *Ann Plast Surg* 1996;37:386-93.
9. Kim SW, Yoon BI, Ha US, Kim SW, Cho YH, Sohn DW. Treatment of paraffin-induced lipogranuloma of the penis by bipediced scrotal flap with Y-V incision. *Ann Plast Surg* 2014;73:692-5.
10. Ma S, Cheng K, Liu Y. Sensibility following innervated free radial forearm flap for penile reconstruction. *Plast Reconstr Surg* 2011;127:235-41.