

RECONSTRUCTIVE

Perigenital Defect Reconstruction Post Giant Condyloma Acuminata Resection: Experience With The Double Keystone Flap

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Abstract: Due to its high recurrence, genital condyloma acuminata should be widely excised to include the full dermal thickness. Curretage is not advisable, as the rate of recurrence is high. The bigger the lesion, the bigger donor area needed to close the defect. The reconstructive options do not merely depend on the defect area, but also on selecting a tissue donor of similar color, thickness, sensation and durability. The ease of donor transfer is equally important. Not many case of giant genital condyloma acuminata wide excision and reconstruction has been reported. For coverage of larger soft tissue defect, skin graft is the most common option; however durability is of concern and the perigenital area is a challenging area to graft. Two cases of perigenital reconstruction after giant genital condyloma excision is reported in this paper, using random perforator based flaps, the double keystone flap.

Patient and Method: Both cases of giant genital condyloma underwent wide excision by the urologist and referred to our division for reconstruction. Both patients are male, and the defects were reconstructed using the double keystone flap. One patient needed a split thickness skin graft to cover remaining defect on the penile shaft.

Result: In both cases, the double keystone flap successfully covered for the defects on the perigenital with tissue quality similar to its original characteristics. No complication ensued. All flaps were vital, no dehiscence nor local infection occurred.

Summary: The double keystone flap is a reliable option for the reconstruction of large defects on the perigenital region.

Keywords: *Giant genital condyloma, keystone flap.*

Abstrak: Karena rekurensinya yang tinggi, condyloma acuminata genital harus dieksisi secara luas agar mencakup ketebalan full dermal thickness. Tindakan kuretase tidak disarankan karena nilai rekurensi yang tinggi. Semakin luas lesi, semakin luas area donor yang dibutuhkan untuk menutup defek. Pilihan rekonstruksi tidak hanya bergantung kepada area defek, tetapi juga pemilihan donor dengan warna yang sama, ketebalan, sensasi, dan durabilitas. Kemudahan dalam transfer donor juga sama pentingnya. Tidak banyak dilaporkan kasus condyloma acuminata genital dengan eksisi luas. Untuk penutupan defek jaringan lunak yang luas, pilihan yang umum adalah dengan skin graft, namun durabilitas serta area genital menjadi tantangan untuk dilakukan skin graft. Dilaporkan dua kasus rekonstruksi perigenital setelah eksisi luas condyloma acuminata genital, dengan menggunakan random perforator based flaps, yaitu keystone flap.

Pasien dan Metode: Dua kasus condyloma acuminata genital dirujuk ke divisi kami setelah dilakukan eksisi luas oleh ahli urologi. Kedua pasien adalah laki-laki. Rekonstruksi defek dilakukan dengan double keystone flap. Satu pasien membutuhkan split thickness graft untuk menutup sisa defek pada penile shaft.

Hasil: Double keystone flap berhasil menutup defek pada area perigenital kedua kasus, dengan kualitas jaringan serupa dengan karakteristik semula. Tidak ada komplikasi, semua flap vital, dan tidak didapatkan dehiscensi maupun infeksi lokal.

Ringkasan: Double keystone flap adalah salah satu pilihan utama pada rekonstruksi defek yang luas pada area perigenital.

Kata Kunci: Giant genital condyloma, keystone flap.

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Anogenital wart (condyloma acuminata or venereal wart) is a commonly found sexually transmitted disease among females and males.^{1,2} The causal role of human papillomaviruses (HPV) in anogenital wart formation has been firmly established biologically and epidemiologically.^{3,4} Therapeutic intervention can be classified into nonoperative and operative treatment methods. Although reports vary depending on the treatment methods and studies, the recurrence rate is as high as 50 to 60% and surgical treatment is generally known to reduce the recurrence rate.⁵ Surgical treatment involves full-thickness excision of the lesion. Choosing reconstructive modalities after giant genital condyloma excision is challenging as the defect size is wide. Possible options include skin graft, local flap or distant flap. (add: limitation of skin graft, advantage of local flap, disadvantage of

distant flap). This article discusses the use of a random perforator based local flap, the double keystone flap. This flap can be potentially used for all area of the body from head to foot.⁶

The keystone design perforator island flap was first published by Felix C Behan in 2003. It is described as “a curvilinear-shaped trapezoidal design flap”. The keystone concept is derived from Behan’s earlier work on the angiotome principle in 1975, where each angiotome may be safely raised as a flap, or extended by linkage vessels with an adjacent angiotome.⁷ The advantages of the keystone perforator flap⁸ is the simplicity of the design, it has a robust vascular supply, reliable healing, shorter operative time, minimal patient morbidity, a relatively pain-free surgery, cost-effective wound closure, with a good aesthetic outcome.

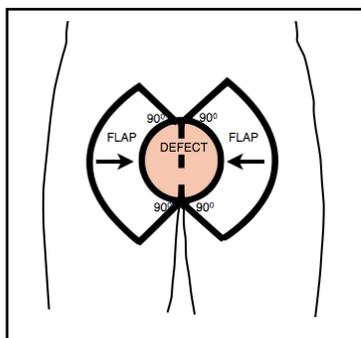


Figure 1. Design of the double keystone flap on perigenital area.



Figure 1. A giant genital condyloma acuminata on 34-year-old man.

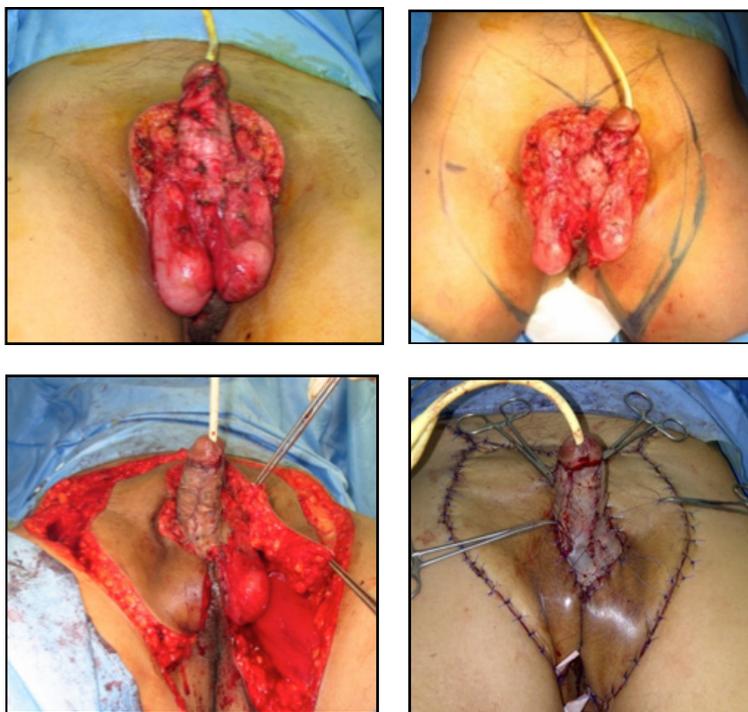


Figure 2. Wide excision of the giant condyloma acuminata involving the penile shaft, pubic and scrotal region. Defect was reconstructed using the double keystone flap and split thickness skin graft.

PATIENT AND METHOD

Case 1. A 34-year-old man with giant condyloma on the shaft of penis and pubic region. The lesion was widely excised from subcoronal region including the pubic and scrotal area. The penile shaft was circumferentially degloved leaving the dartos fascia and testicles exposed. The penile shaft was resurfaced with split thickness skin graft taken from the lateral thigh. A double keystone flap (type 4) was used to cover the full-thickness pubic and scrotal defect. Incision was made through the deep fascia at the convex side, 1/3 of the inferior part of both flaps were undermined to become neoscrotal skin. No complication occurred after the procedure, and the graft took a 100%.

Case 2. 56-year-old man with giant condyloma acuminata involving the pubic region, part of the penile shaft and scrotal skin underwent wide excision, leaving a full thickness defect at the region involved. The penile shaft and scrotal region defects were completely covered with the double keystone flaps. Incision was made suprafascially on the medial (concave) sides of the flap, and subfacially on both lateral (convex) sides to allow more flap mobilization. All the defect was closed primarily.

DISCUSSION

Several strategies are always available in reconstructive planning. Selecting the most appropriate technique for a particular defect for each patient is always a unique, personal, and precious experience. This article shares the experience in reconstructing a wide defect following giant genital and perigenital condyloma excision by utilizing a local random-perforator based flaps. In both cases the double keystone flaps successfully covered the defects with no complications. In one case, the penile shaft surface was covered using the split-thickness skin graft (STSG) because this area requires a thinner coverage. Ballaro et al. also reported the use of STSG after split excision of extensive genital warts for penile resurfacing.⁹



Figure 3. A giant condyloma acuminata on the penoscrotal region in a 56-year-old man.

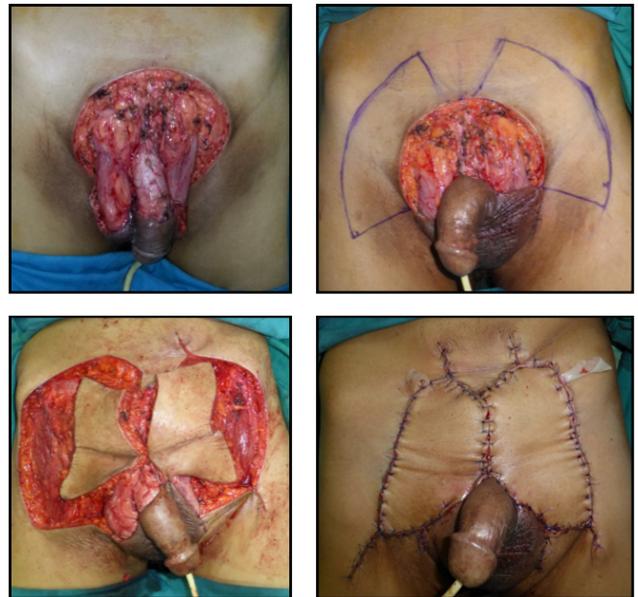


Figure 4. The defect after excision of the giant perigenital condyloma was covered using a double keystone flap. The remaining penile and scrotal skin was fashioned to cover for the defect of the proximal penile and scrotum.

They reported normal penile sensation, normal erection, and no sexual dysfunction. In their report, the remaining defect were closed with rotational flap.⁹ Reconstruction of a complete penile skin excision using full-thickness skin graft (FTSG) is recommended for the potent patients,¹⁰ as contraction of the STSG may lead to penile encasement and sexual dysfunction. Defect at scrotal region in one of the case reported was reconstructed using the inferior part of keystone flap, undermined subfacially (type 4 keystone flap). Jihoon Y et al. and Maguina P reported the use of a bilateral

medial thigh fasciocutaneous flap for reconstruction of the perineoscrotal defects.^{11,12}

Sharma et al. preferred the FTSG to cover for defects on the penile and scrotal region.¹³ In our case, full-thickness defect of the penile shaft was resurfaced using the STSG because FTSG generally 'take' less successfully than STSG, and this process is further compromised on the penile shaft by physiological anatomical mobility and the delicate nature of the Buck's fascia.¹⁴ From the two cases of bilateral/double keystone used to reconstruct relatively wide defects after giantperineal condyloma excision in this report, the result is satisfying. Operative time in both cases were relatively short (3 hours), flap mobility was adequate, vascularization was reliable; the colour, texture, durability, and bulkiness of the flaps resembled its surrounding tissues. This technique barely leaves a secondary defect from donor area because the flaps are raised right from the adjacent tissues.

SUMMARY

Reconstruction of perigenital defect following excision giant genital condyloma may utilize various modalities. The double keystone random perforator flap as in this patient is a single-stage reconstructive strategy that can be performed in any health facility due to its simplicity and reliability.

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