

TRIPLE VY ADVANCEMENT FLAP FOR VULVA AND ANAL RECONSTRUCTION IN EXTENSIVE PERINEAL SQUAMOUS CELL CARCINOMA IN-SITU

Chairani Fitri Saphira^{1*}, Bien-Keem Tan², Sun-Kuie Tay³

1. *Dr. Mohamad Soewandhie General Hospital, Surabaya, Indonesia*
2. *Department of Plastic, Reconstructive and Aesthetic Surgery, Singapore General Hospital, Singapore*
3. *Departement of Obstetrics and Gynaecology, Singapore General Hospital, Singapore*

ABSTRACT

Background : Algorithm for vulvar reconstructions in defects after oncologic resection of vulvar tumors has been established. It goals are to restores form and function for the purpose of coitus, micturition, and defecation. The purpose of this article is to present our experience in vulvar and anal reconstruction.

Method : A 43-year-old female with extensive vulvar, perineal and anal squamous cell carcinoma in-situ and groin lymph nodes metastasis requiring defect coverage after tumor resection. The defects involving exposed soft tissue around vulvar, perineal and anal areas.

Result : Vulvar and anal reconstruction was done in stages utilizing triple VY advancement flap. The reconstruction was successful with preservation of sexual and anal functions; and minimal scarring.

Conclusion: Extensive vulvar and anal defects can be reconstructed by recruiting local tissue. VY advancement flap is one of the best options in these reconstructions.

Keywords: *vulva; anus; perineum; squamous cell carcinoma; reconstruction; VY advancement flap*

Latar Belakang : Algoritma rekonstruksi untuk defek vulva pasca reseksi tumor vulva telah banyak dipublikasikan. Rekonstruksi anatomis dan fisiologis dilakukan untuk mempertahankan fungsi seksual, miksi dan defekasi tetap normal. Tulisan ini disusun berdasarkan pengalaman penulis dalam rekonstruksi vulva dan anus.

Metodologi: Penutupan defek setelah reseksi tumor pada pasien perempuan usia 43 tahun dengan *squamous cell carcinoma in-situ* luas di area vulva, perineum dan anus serta metastasis kelenjar getah bening inguinal.

Hasil: rekonstruksi vulva dan anus dilakukan bertahap menggunakan *triple VY advancement flap*. Rekonstruksi berhasil dilakukan dengan pulihnya fungsi seksual dan anus serta parut yang minimal.

Kesimpulan: Rekonstruksi untuk defek luas di area vulva dan anus dapat dilakukan menggunakan jaringan sekitar. *VY advancement flap* adalah salah satu pilihan terbaik untuk rekonstruksi semacam ini.

Kata Kunci : *vulva; anus; perineum; squamous cell carcinoma; reconstruction; VY advancement flap*

Received: 1 November 2017, Revised: 16 December 2017, Accepted: 20 December 2017

ISSN 2089-6492 ; E-ISSN 2089-9734

This Article can be viewed at www.jprjournal.com

INTRODUCTION

The increasing incidence of vulvar tumors has lead to an increase in the reconstructive options of the vulva and perineum. Without reconstruction, surgical resection would cause mutilation and scarring of the perineum. The goals of reconstruction are to restore normal anatomy and function of the female external genitalia, to preserve normal body image, sexual function, micturition and defecation

CASE REPORT

A 43-year-old female presented with cervical, vulvar, perineal and anal lesions. She complained of non-healing progressive erosions and persistent itch over these areas. Physical examination revealed erythematous plaques and ulcerated lesions over the vulvar, perineal and anal regions (fig. 1). Biopsy obtained showed a high grade squamous intraepithelial carcinoma. After further biopsies in the operating room, the results revealed cervical intraepithelial neoplasia (CIN) 3, vaginal intraepithelial neoplasia (VaIN) 3, vulvar intraepithelial neoplasia (VIN) 3 and perineal invasive squamous cell carcinoma. Virological studies detected Human Papilloma Virus (HPV) 16 and other high risk HPV. Prior to tumor resection, with the purpose of keeping the surgical site free of faecal contamination, the patient underwent a right transverse loop colostomy.

After colposcopy showed no invasive lesion, laser ablation of the vaginal and cervical lesions was performed. Radical vulvectomy of the lower third of the vulva including the posterior vaginal wall was performed. Additionally, circumferential excision of the perianal skin, including all anal mucosa below the dentate line was performed. The resultant defect exposed soft tissue inferior to the vaginal vestibule and extending posteriorly of the defect to include perineum and posterior natal cleft (fig. 2). Owing to the complexity, a staged reconstructive surgery was planned.

The first surgery was done to reconstruct the posterior vaginal wall and vulva. It was undertaken immediately after tumor excision. The edges of the remaining vaginal wall were advanced and apposed to repair posterior vaginal wall. The cervix was allowed to granulate and remucosalise. After using the Doppler to identify the perforators, bilateral gluteal fold VY advancement flaps supplied by perforators of the internal pudendal artery were raised to reconstruct the vulva and perineum (fig. 3a).

The patient was nursed mostly in supine position and occasionally in prone position to relieve pressure over the perianal area.

By knowing the anatomy of the hand and its After the gluteal fold VY advancement flaps had healed, a second reconstructive surgery was performed a month later. Staging the operation allowed raising another flap adjacent to the gluteal fold VY advancement flap with minimal compromise to flap viability. At this time, a successful partition between the vagina and anus was achieved. Patient then underwent reconstruction for her perianal defect. The finding was a circumferential anal defect up to the dentate line. The anal sphincter was intact. The anus was clean owing to her prior faecal diversion. The remaining defect over the perianal area was covered with unilateral VY advancement flap from the right buttock to achieve skin coverage of at least half the anal circumference. This was deemed important in order to prevent the circumferentially denuded anus from stenosing and retracting proximally. Doppler identification of perforator vessels for the flap was done before raising the flap. The 6 o'clock limb of the flap was inset against the gluteal fold flaps to reinforce the partition between vagina and anus. The leading edge of the flap was then sutured to the anal sphincter for added strength in the repair (fig. 3b). A raw area superior of the flap was left to granulate with patient nursed in full prone position. Her wounds were cultured positive for *Escherichia coli* and *Enterococcus faecalis* and she was treated with appropriate antibiotics. After 2 weeks, the granulating area was closed secondarily. Reversal of the colostomy was performed at 3 weeks when anus was completely healed. Patient then underwent radiotherapy of both groins.

Follow up 6 months after her initial surgery showed minimal scarring without any complains pertaining to sexual and bowel functions (fig. 4). Ijxpp She has normal bowel habits and has resumed sexual intercourse with her partner. Examination using Hegar dilators of her introitus and anus showed no stenosis

Disclosure: *The authors have no financial interest to disclose.*



Figure 1. Squamous cell carcinoma in-situ over the vulvar, perineal and anal areas



Figure 2. Defect after tumor resection. Left-Vulva and perineal defect. Right-Anal defect



Figure 3a. Bilateral VY advancement gluteal fold flaps. Left-the circular markings indicate the locations of the Doppler signals. Right-at the completion of inset. b. Left-Unilateral VY advancement flap from right buttock. The advancement edge of the flap was sutured to the anal sphincter with 2-0 Vicryl sutures. A second layer of 3-0 sutures apposed skin to anal mucosa. Right-At the completion of inset



Figure 4. Final result after 6 months. Left-Reconstructed vulva and perineum. Right-Reconstructed perianal

RESULT

The incidence of genitalia squamous cell carcinoma in situ, including cervix, vagina and vulva, for women between ages 40 to 49 years is 2.9 per 100,000 women in United States. Proven risk factors are sexual behavior, smoking and HPV infection.¹ Association between high risk HPV genotypes and malignancy is well established, where HPV 16 and 18 are associated with 70-80% of VIN lesions, and about 30-40% of invasive vulvar cancers.² The vast majority of precursor lesions to these cancers, CIN, VIN and Vain, are caused by HPV infection.³

In a single-grading system, only high-grade disease is classified as VIN.⁴ Low grade lesions however are typically a self-limiting, infection that does not require aggressive treatment, while higher grade lesions may require aggressive surgical management to prevent progression to invasive cancer. In women with multifocal and extensive disease, laser ablation is an alternative to excisional therapy, provided there is no coexistent invasive cancer. According to Committee on Gynecologic Practice of the American Society for Colposcopy and Cervical Pathology in 2016, treatment is recommended for all women with VIN. Because of the potential for occult invasion, wide local excision should be performed if cancer is suspected.⁵

In terms of surgical therapy, wide local excision is recommended after histological confirmation and diagnosis. The excision should include gross margins of 0.5-1 cm around tissue with visible disease, but may be altered to avoid injury to the clitoris, urethra, anus, or other critical structures. Patients with clear margins in the excised tissue specimens have a lower, although still significant,

risk of recurrence compared with women with involved margins.⁶ Wide local excision is also acceptable for patients in whom cancer is not suspected. Treatment by local excision is both diagnostic and therapeutic.⁷

Defects resulting from oncologic resection of vulvar tumors require complex reconstruction to restore form and function. The use of faecal diversion protects the newly constructed wound from being infected. Thus, potential morbidity and mortality can be averted. The consideration of temporary faecal diversion is of great importance in these settings to avert potential morbidity.⁸ The goals of reconstruction include providing quality skin cover thus minimizing scarring and distortion, restoring the vaginal introitus and vault, and maintaining the central position of the urethral meatus and preventing stenosis.⁹ The method of reconstruction and choice of flap depends on the extent and location of the vulvar defect. In an algorithm for vulvar defects reconstruction, lower third vulvar defects over the vaginal orifice and perineum are best covered using gluteal fold VY advancement flap.⁹ This flap is thin, reliable, sensate, easy to perform, and has matched local skin quality and concealed donor-site scar on the gluteal fold. In addition, it can cover large vulvovaginal defects because it can be advanced farther as a result of the laxity of the gluteal fold area.¹⁰ Gluteal fold fasciocutaneous VY advancement flap has proven very useful for vulvar reconstruction, especially from the view point of donor-site scarring, flap thickness, and flap advancement.

Additionally, gluteal fold VY advancement flap is a sensate flap¹¹; therefore using this flap could preserve patients' quality of sexual function.

Special attention should be paid when suturing in a deep recess or around the urethra or anus where key stitches placed and left untied initially. They are then sequentially tied once it is determined that all stitches are evenly distributed.⁹ The size of the gluteal fold VY advancement flap can be adjusted to the required volume.¹² For perianal defects, VY advancement flaps are an effective and feasible technique to cover them after aggressive surgeries.¹³ Reported post-operative morbidities are partial dehiscence, partial flap loss, anal stenosis and incontinence. A literature reported a success in reconstruction of perianal defect using a bilateral VY advancement flap based on the perforating arteries of the gluteus maximus over a cicatricial area.¹⁴ Patient positioning also plays important role. During surgery, proper positioning aids distribute wound tension and avoid widening of the wounds. Post operatively, patient can be nursed in prone if the defect is predominantly posterior where avoidance of pressure on the flap for the first 10 days is very important for successful outcome.^{9,15} In patients with temporary faecal diversion, stoma closure within 3 months present a better functional outcome compared with reversal after 3 months.¹⁶ Early rehabilitation prevents reduced functional adaptability of the intestinal components after a temporary stoma surgery.

CASE REPORT

This case presentation highlights the complexity of perineal reconstruction and the procedures necessary for successful restoration of sexual and anal functions.

List of Abbreviations

CIN	Cervical Intraepithelial Carcinoma
HPV	Human Papilloma Virus
VaIN	Vaginal Intraepithelial Carcinoma
VIN	Vulvar Intraepithelial Carcinoma

Corresponding author :

Bien-Keem Tan, MD
bienkeem@gmail.com

REFERENCES

1. Joura E.A. Trends in vulvar neoplasia. Increasing incidence of vulvar intraepithelial neoplasia and squamous cell carcinoma of the vulva in young women. *J. Reprod. Med.* 2000;45(8):613–615.
2. Hillemanns P. Evaluation of different treatment modalities for vulvar intraepithelial neoplasia (VIN): CO(2) laser vaporization, photodynamic therapy, excision and vulvectomy. *Gynecol. Oncol.* 2006;100(2):271–275.
3. Hampl M, Sarajuuri H, Wentzensen N, Bender HG, Kueppers V. Effect of human papillomavirus vaccines on vulvar, vaginal, and anal intraepithelial lesions and vulvar cancer. *Obstet Gynecol.* 2006;108(6):1361–1368.
4. Sideri M, Jones RW, Wilkinson EJ, Preti M, Heller DS, Scurry J, et al. Squamous vulvar intraepithelial neoplasia: 2004 modified terminology, ISSVD Vulvar Oncology Subcommittee. *J Reprod Med* 2005;50:807–10.
5. The American Congress of Obstetricians and Gynecologists. Management of Vulvar Intraepithelial Neoplasia. Available at: <http://www.acog.org>. Accessed October 28, 2017.
6. Modesitt SC, Waters AB, Walton L, Fowler WC Jr, Van Le L. Vulvar intraepithelial neoplasia III: occult cancer and the impact of margin status on recurrence. *ObstetGynecol* 1998;92:962–6.
7. Sykes P, Smith N, McCormick P, Frizelle FA. High-grade vulval intraepithelial neoplasia (VIN 3): a retrospective analysis of patient characteristics, management, outcome and relationship to squamous cell carcinoma of the vulva. *Aust N Z J ObstetGynaecol.* 2002 Feb; 42(1):69-74.
8. Lightner AL, Pemberton JH. The Role of Temporary Fecal Diversion. *Clin Colon Rectal Surg.* 2017 Jul;30(3):178-183. doi: 10.1055/s-0037-1598158. Epub 2017 May 22.
9. Tan BK, Kang GCW, Tay EH, Por YC. Subunit Principle of Vulvar Reconstruction: Algorithm and Outcomes. *Arch Plast Surg.* 2014 Jul; 41(4): 379–386. doi: 10.5999/aps.2014.41.4.379.
10. Lee PK, Choi MS, Ahn ST, Oh DY, Rhie JW, Han KT. Gluteal fold V-Y advancement flap for vulvar and vaginal reconstruction: a new flap. *PlastReconstr Surg.* 2006 Aug;118(2):401-6.
11. Kuokkanen H, Mikkola A, Nyberg RH, Vuento MH, Kaartinen I, Kuoppala T. Reconstruction of the vulva with sensate gluteal fold flaps. *Scand J Surg.* 2013;102(1):32-5.

12. Hashimoto I, Nakanishi H, Nagae H, Harada H, Sedo H. The gluteal-fold flap for vulvar and buttock reconstruction: anatomic study and adjustment of flap volume. *Plast Reconstr Surg*. 2001 Dec;108(7):1998-2005.
13. Ibañez N, Abrisqueta J, Luján J, Hernández Q, Parrilla P. V-Y Advancement Flaps for Extensive Perianal Defect Repair. *Cirugía Española*. 2016 Nov;94(9):525-30. doi: 10.1016/j.cireng.2016.10.006
14. Benito P, García J, De Juan A, Alcazar JA, Elena E, Cano M. Reconstruction of a perianal defect by means of a bilateral V-Y advancement flap based on the perforating arteries of the gluteus maximus shaped over a cicatricial area. *J Plast Reconstr Aesthet Surg*. 2009 Mar;62(3):412-4. doi: 10.1016/j.bjps.2008.05.032.
15. El-Sabbagh A. Versatility of V-Y Flap in Gluteal Area. *World J Plast Surg* 2016;5(2):154-159.
16. Kim CN. Can the Timing of Ileostomy Reversal Influence Functional Outcome? *Ann Coloproctol*. 2015 Feb; 31(1): 5–6. doi: 10.3393/ac.2015.31.1.5