



## Case series

## Utilizing V–Y fasciocutaneous advancement flaps for vulvar reconstruction

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## A B S T R A C T

**Objectives:** We aimed to analyze the outcomes of patients who underwent vulvectomy with subsequent V–Y fasciocutaneous flap reconstruction.

**Methods:** All medical records of all patients who underwent vulvectomies with V–Y fasciocutaneous flap reconstruction from January 2007 to June 2016 were retrospectively reviewed. Patient clinical and surgical data, demographics, and outcomes were abstracted.

**Results:** Of the 27 patients, 42 flaps were transferred. A simple vulvectomy was performed in 8 (30%) patients, partial radical vulvectomy in 15 (56%), and radical vulvectomy in 4 (15%). The median area of defect was 30 cm<sup>2</sup>. Minor wound separations occurred in 9 patients (33%). Infectious complications occurred in 4 patients (15%); this included urinary tract infections in 2 (50%), postoperative fevers in 2 (50%), and sepsis in 1 (25%) patient with a UTI. There were no instances of flap necrosis, wound dehiscence, or wound infections. Black race was more likely to be associated with an infectious complication with 3 (75%) patients, compared to white race with 1 (4%) patient ( $p < .01$ ). The presence of diabetes was more likely to be associated with an infectious complication in 2 (67%) patients, compared to 1 (4%) in non-diabetic patients ( $p < .01$ ). No other significant association was found during analysis of demographics, medical comorbidities, vulvar pathology, or surgical factors affecting V–Y fasciocutaneous flap infectious complications or minor wound separations.

**Conclusions:** The use of a V–Y fasciocutaneous advancement flap for vulvar reconstruction is safe and associated with mostly minor complications. Infectious complications were more frequently associated with diabetes, black race, and HIV.

## 1. Introduction

Vulvar cancer is a rare gynecologic malignancy that comprises only 3–5% of all gynecologic neoplasms (Judson et al., 2006; Carramaschi et al., 1999). In 2018, there will be an estimated 6190 new cases and 1200 deaths from vulvar cancer (Siegel et al., 2018). Squamous cell carcinoma (SCC) is the predominant tumor type and accounts for > 90% of all cases (Del Pino et al., 2013; Lazzaro et al., 2010).

Vulvar cancer and other vulvar pathologies are usually treated with an en bloc vulvectomy, due to the high rate of recurrence. Postoperative dehiscence, lymphocysts, and lymphedema rates have been reported as high as 64–85% (Carramaschi et al., 1999). In recent years a modified approach has been used to decrease morbidity. Primary closure is possible, however tension placed on the site can result in extensive tissue breakdown and prolonged healing. Additionally, the aesthetic

result can impair patient's sexual and urinary functions. Necrosis, dehiscence, and infections can all prolong hospitalization.

A variety of reconstructive techniques have been employed to reconstruct residual vulvectomy defects in an effort to decrease postoperative complications, length of hospital stay, and to improve patient satisfaction (Carramaschi et al., 1999; McCraw et al., 1976; Lin et al., 1992). These reconstructive techniques include the use of skin grafts, local skin flaps, regional skin flaps, and distant skin flaps. Regional flaps utilize the tissue in the area of the defect but often do not about the defect. They are mostly myocutaneous and thus, tend to be bulky. These flaps result in increased operating time and high complication rates (Carramaschi et al., 1999; McCraw et al., 1976; Chen et al., 1995). Distant flaps utilize tissue far from the defect. They can either be created with a vascular pedicle in order to leave the vascular supply anatomically connected, or harvested as free flaps with the vascular

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supply being interrupted and then reconnected.

The V–Y advancement flap is a local fasciocutaneous flap that involves mobilizing the adjacent skin and underlying subcutaneous tissue to cover the primary defect. The letter “V” represents the initial V-shaped incision that is created along the adjacent skin and underlying subcutaneous tissue that is mobilized over the primary vulvar defect. The letter “Y” represents how the skin is closed, with the tail denoting the primary closure of the harvested site. This technique can be used when the donor site has enough laxity to allow appropriate mobilization to cover the defect at the time of initial surgery. (Carramaschi et al., 1999; Tateo et al., 1996; Benedetti Panici et al., 2014; Lee et al., 2006). This is an ideal treatment as restoration can occur at the time of demolitive surgery and primary healing can occur. These flaps may be erythematous and edematous for weeks but should be in their final form at 3 to 6 months. It is also beneficial as similar skin characteristics can be found in the local flap. The aim of our study was to analyze the outcomes of patients who underwent vulvectomy with subsequent V–Y fasciocutaneous flap reconstruction from adjacent gluteal or medial thigh folds for a variety of vulvar pathologies at a single institution.

## 2. Methods

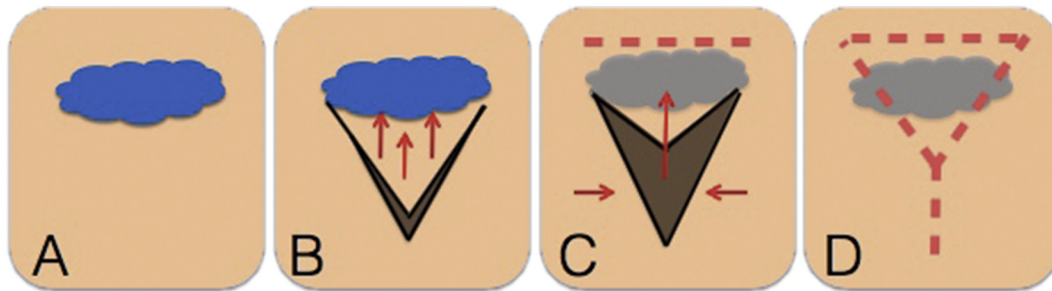
### 2.1. Patient population

The medical records of all patients who underwent a vulvectomy with V–Y fasciocutaneous flap reconstruction at Thomas Jefferson University Hospital (TJUH) from January 1, 2007 to June 1, 2016 were retrospectively reviewed after obtaining IRB approval. Demographic, surgical information, disease outcomes, and complications were abstracted. Patients without adequate medical records were excluded. All patients were given preoperative deep vein thrombosis prophylaxis with heparin as well as preoperative antibiotics. They were placed in

dorsal lithotomy position, prepped with chlorhexidine and betadine, and had a Foley catheter placed. A gynecologic oncologist performed the first portion of the surgery, which ranged from a simple vulvectomy, partial radical vulvectomy, or radical vulvectomy plus unilateral or bilateral groin dissection, depending on pathology. A plastic surgeon performed the second portion of the surgery, a V–Y fasciocutaneous advancement flap from the adjacent gluteal or medial thigh folds. Unilateral or bilateral V–Y flap reconstruction was performed based on the size of the tumor and defect after primary excision. The wound was irrigated with antibiotic irrigation and the flaps were incised with a scalpel. The flap was mobilized down to the muscular fascia and elevated with undermining of the subcutaneous tissue. A JP drain, if necessitated by the size of defect, was placed beneath the flap and brought out anteriorly through the skin. The wound was closed in multiple layers with deep dermal sutures followed by a running subcuticular closure in order to prevent the most amount of tension. This is detailed in Figs. 1 and 2. Postoperatively, patients were allowed to ambulate the morning after surgery. Sequential compression devices were used throughout the surgery and postoperatively in the hospital to prevent deep venous thrombosis. Prophylactic subcutaneous heparin was administered every 8 h, starting on postoperative day 1 during the hospital stay.

### 2.2. Statistics

Descriptive statistics were used to summarize the characteristics of the patient population, surgical procedures, and surgical outcomes with medians, ranges, and frequencies. The associations between demographics, medical comorbidities, type of vulvar pathology, or surgical factors affecting V–Y fasciocutaneous flap minor wound separations and infectious complications were examined. *t*-tests were used to compare means of continuous variables or Mann-Whitney to compare



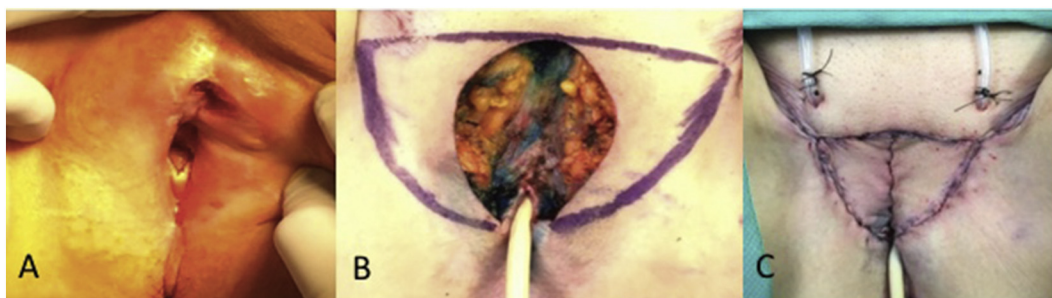
**Fig. 1.** Creation of V–Y Fasciocutaneous Flap.

A. Initial defect in blue.

B. Initial V-shaped skin incision is made adjacent to the defect. Subcutaneous tissue underlying V is undermined.

C. V-shaped skin is mobilized over the primary vulvar defect, is mobilized and medial edge closed.

D. Apex of the V is closed linearly. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



**Fig. 2.** Radical vulvectomy with bilateral V–Y Fasciocutaneous Advancement Flaps.

Initial defect prior to surgical intervention.

After resection of the lesion with marked flaps to be excised.

Final appearance of bilateral flaps in place.

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