



## Use of a Novel ‘M’ Flap in Radical Vulvectomy Reconstruction

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### Abstract

We report the case of a 37-year-old woman with vulvar squamous cell carcinoma, status post bilateral vulvectomy with lymph node dissection. Bilateral pudendal flaps, also known as the Singapore or groin flap, and posterior thigh flaps were combined with bilateral fat injections into the neolabia in order to create a functional and a more aesthetically pleasing reconstruction. We propose to call the combination of flaps an “M” Flap.

### Introduction

As vulvar malignancies are rare, reconstruction post radical vulvectomy does not have a standard established process. Different pedicled flaps, such as the gracilis flap, vastus lateralis thigh flap, anterolateral thigh flap and Vertical Rectus Abdominal Flap (VRAM), have all been utilized to reconstruct the vulva with varying degrees of success. Many of these options are fraught with donor site morbidity and poor aesthetic results. The use of the bilateral Singapore flaps and posterior thigh flaps, (the “M” flap), is an optimal combination of local flaps because it is easier to raise and inset, and has a well concealed donor site scar. This flap combination is better tolerated by the body and, with fat injection added at a later stage, yields in thicker tissues. Ultimately, coitus, micturition, and defecation are much improved. It is our belief that the use of this technique could become a standard of care in future vulvar reconstructions.

### Case Presentation

The patient is a 37-year-old female with a past medical history of polycystic ovary syndrome; lichen sclerosis and vulvar squamous cell carcinoma. The patient initially presented with vulvar pruritus for approximately three years and underwent multiple vulvar biopsies, with the final biopsy having features consistent with invasive squamous carcinoma. The patient initially underwent a partial vulvectomy without reconstruction. Eight months later, repeat biopsies confirmed recurrence, and a radical vulvectomy and vulvar reconstruction was planned in collaboration with plastic surgery. At the initial preoperative evaluation, the patient was counseled about the risks of the procedures which included possible flap failure due to the adiposity of the patient’s thighs and a BMI of 37. After the ablative surgery was completed, it was determined that the vulvar defect was too large to use only the bilateral pudendal flaps. To ensure adequate tissue closure once the flaps were mobilized, we used the posterior thigh flaps. Intraoperative SPY angiography was utilized to ensure adequate vascularity of the bilateral pudendal and posterior thigh flaps. Immediate reconstruction of the vulvar defect was successful using the combination of bilateral pudendal flaps and posterior thigh flaps. As expected, the extra tissues needed to close donor sites were sufficient once the posterior thigh flap was mobilized. With the combination of these two flaps, the reconstruction had an appearance of an “M” written in cursive, leading to our proposal of the combination “M” flap.

Two months after the reconstruction, the patient presented with a minor soft tissue infection. The bilateral groin cellulitis required a minor debridement. One month later, and three months after the initial reconstruction, the patient had a vaginal biopsy for a new white perineal lesion. The biopsy result showed reactive squamous hyperplasia without evidence of squamous dysplasia or malignancy. This area was closed with a simple z-plasty. Six months after the initial reconstruction, the patient underwent liposuction and fat grafting for labia majora augmentation. Fat harvested from the abdomen and mons was transferred into the neolabia, bilaterally. Kenalog was injected into the posterior thigh scars. The introitus at that time appeared to be 1.5 cm deep to the external labia (Figures 1 to 4).

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**Figure 1:** Mobilization of posterior thigh flaps. Bilateral posterior thigh flaps were used in order to have proper mobilization for reconstruction.



**Figure 2:** These images depict the extent of tissue resection post radical vulvectomy. (A) Radical vulvectomy. Resection of all vulvar tissue, including the clitoris, was necessary due to invasive vulvar squamous cell carcinoma. (B) Introitus and urethra. The introitus was preserved. The vulvar tissue was reconstructed around the introitus to preserve day to day and sexual function.



**Figure 3:** Post tissue mobilization and reconstruction with the "M" flap. (A) Skin reapproximation. The skin was re-approximated with staples before sutures were placed. (B and C) "M" flap. The proposed name for the combined bilateral pudendal and posterior thigh flaps can be seen in the "M" structure they create.

**Discussion**

The diagnosis of vulvar cancer is relatively rare and accounts for about 6% of cancers of the female reproductive organs and less than 1% of all cancers in women. There are several types of vulvar cancers ranging from squamous cell carcinoma, melanoma, adenocarcinoma, sarcoma, and verrucous carcinoma [1]. Our patient had vulvar



**Figure 4:** Liposuction and fat grafting of the neolabia. (A) Neolabia. Healed scars from the "M" flap as well as the neolabia prior to fat grafting is shown. (B) Liposuction. Fat was harvested via liposuction for fat grafting. (C and D) Post fat grafting of neolabia. The labia majora were augmented to increase the depth of the introitus. Image 4D shows the final results of the fat grafting procedure.

squamous cell carcinoma which accounts for ~90% of all vulvar carcinomas. This rare cancer unfortunately has a high mortality rate, and its rarity leaves reconstruction options unstandardized [2]. Standard treatment for vulvar carcinomas is surgery typically involves the removal of malignant tissue with margins. Previously, the malignancy was treated with radical vulvectomy and lymph node dissections. However, it was determined that regardless of the stage of cancer; life expectancy was not considerably improved using such treatment modalities. In addition, quality of life, particularly sexual health, was impaired. This led to less invasive surgical techniques being utilized. There are a number of flaps that can be used to recreate the vulva and labia [3]. One article uses an algorithm to decide which flap would be best based on the missing anatomical subunit [4]. In this article, reconstructions ranged from simple V-Y closures, to pedicled flaps, like Vertical Rectus Abdominis Myocutaneous flaps (VRAM), Anterolateral Thigh Flap (ALT), gracilis myocutaneous flaps, and free flaps, on rare occasions [4].

Our patient's case was unique because she was young and nulliparous. Additionally, her pre-existing obesity increased her risk of postoperative complications. Increased complications in reconstruction patients with BMI greater than 35 are well documented in the literature. Obesity has led to increased risk for infection, DVT, pulmonary embolism, and partial and total flap loss. This patient experienced a three years history of pruritus, multiple vulvar biopsies, and a partial vulvectomy [5]. The potential diffuse spread of this cancer, combined with the previous resection of portions of the labia and clitoris, caused us to be concerned about the anticipated post-operative defect. Perioperative patient counseling and surgical planning regarding the adiposity of the patient's thighs, was critical. The combination of bilateral pudendal flap and posterior thigh flap was determined to be adequate to replace the tissue defect caused by the ablative surgery. Using local flaps and maximizing vascularity and natural skin folds make the "M" flap optimal. The pudendal flap, used to reconstruct the introitus and external labia, was optimal. The robust posterior thigh flap resulted in favorable appearance of

the closed donor sites and incisions hid well in the groin crease. Six months after the reconstruction, liposuction and fat grafting for labia majora augmentation increased the depth of the introitus to 1.5 cm. The reconstruction of the vulvar defect was successful using the combination of bilateral pudendal flap and posterior thigh flap. As planned, the extra tissue needed to close the groin crease, was supplied with tissue rearrangement from the posterior thigh flap. The reconstruction had an appearance of an “M” written in cursive. The benefits of using this novel flap, even with obesity, include better aesthetic results, thicker tissue, better functional results, and decreased donor site morbidity. As previously discussed, the prior resection and lack of native tissue had no effect on the final reconstruction because of the excess tissue provided by the M Flap. This M flap reconstruction option provides both aesthetic as well as functional benefits for patients overall, and could be an interesting option for patients who undergo radical vulvectomy.

## Conclusion

This report discusses the reconstructive process of a woman with a history of vulvar squamous cell carcinoma who underwent a radical

vulvectomy. The proposed “M” flap should be considered in use for reconstruction post-radical vulvectomy due to both aesthetic and functional benefits. Further research should be done on morbidities and benefits of specific reconstruction options, including that of this proposed flap.

## References

1. American Society of Clinical Oncology [Internet]. [cited 2019 Dec 17].
2. Medical News Today [Internet]. [cited 2020 Jan 6].
3. American Cancer Society. [Internet]. [cited 2020 Jan 6].
4. Gentileschi S, Servillo M, Garganese G, Fragomeni S, De Bonis F, Scambia G, et al. Surgical therapy of vulvar cancer: how to choose the correct reconstruction? *J Gynecol Oncol*. 2016;27(6):e60.
5. Rao S, Stolle E, Sher S, Lin C, Momen B, Nahabedian M. A multiple logistic regression analysis of complications following microsurgical breast reconstruction. *Gland Surg*. 2014;3(4): 226-31.