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# Reconstruction of soft tissue defect after 4th degree obstetric perineal laceration using perforator based bilateral V-Y advancement: A case report and review of the literature

**Nuh Evin*, Merve Kaplanlı Sarıdogan**

*Department of Plastic, Reconstructive and Aesthetic Surgery, Faculty of Medicine, Bezmialem Vakıf University, İstanbul, Türkiye*

## ABSTRACT

Obstetric anal sphincter injuries occur after urgent and difficult delivery. It may vary in extent and severity, ranging from minor mucosal tears of vagina to full-thickness lacerations that compromise the integrity and function of the anal sphincter complex. The anal sphincter is affected in third and fourth degree lacerations, and results anal incontinence, social, psychological and sexual problems, decreased quality of life, and financial costs. A 23-year-old female patient presented with a 5x5 cm perineal soft tissue defect extending from the posterior vaginal wall to the perianal skin following fourth-degree perineal laceration. The soft tissue defect was reconstructed with bilateral gluteal perforator-based V-Y advancement flaps. Aesthetically and functionally satisfactory results were obtained. Perineal reconstruction requires a multifaceted and algorithmic surgical approach based on the characteristics of the defect and the reconstructive needs. The perforator-based V-Y advancement flaps are an alternative reconstruction option for obstetric perineal defects, offering simplicity and effectiveness in preserving anatomical and physiological function.

**Keywords:** Fourth-degree perineal laceration, obstetric injury, perineal laceration, V-Y advancement flap, perforator flap.

✉ *Nuh Evin*, M.D., FEBOPRAS*
*Department of Plastic, Reconstructive and Aesthetic Surgery, Faculty of Medicine, Bezmialem Vakıf University, İstanbul, Türkiye*
*E-mail: nuhevin@gmail.com*

## Introduction

Obstetric anal sphincter injuries (OASIs) occur after difficult delivery. The risk factors include young maternal age, nulliparity, malpresentation, instrument delivery, fetal over weight, difficult delivery and labor induction [1-3].

OASIs may vary in extent and severity, ranging from minor mucosal tears of vagina to full-thickness lacerations that compromise the integrity and function of the anal sphincter. The anal sphincter is affected in third and fourth degree lacerations, and results anal incontinence, social and sexual problems, decreased quality of life and financial costs [1,3,4].

OASIs occur in 1–9% of all vaginal deliveries, while fourth degree lacerations are observed in 0.03–0.2% [1,2,4]. These lacerations can be detected clinically after delivery and require early multidisciplinary management to increase quality of life and early return to daily activity. The location of tissue defects and the extent of perineal involvement determine the treatment strategy. This study presents a reconstruction of a soft tissue defect after a fourth-degree obstetric perineal laceration using a perforator-based bilateral V-Y advancement and a review of the literature.

## Case Report

A 23-year-old primigravida at 40 weeks and 3 days of gestation presented to the obstetric clinic with labor pains. After 21 hours in the dilation phase of the first stage of labor, with full cervical dilation and fetal head crowning, she delivered a healthy 4480-gram female infant in occiput anterior position. Vaginal and rectal examination revealed a 2–3 cm laceration in the lower third of the posterior vaginal wall and anterior rectal wall, consistent with a fourth-degree perineal laceration.

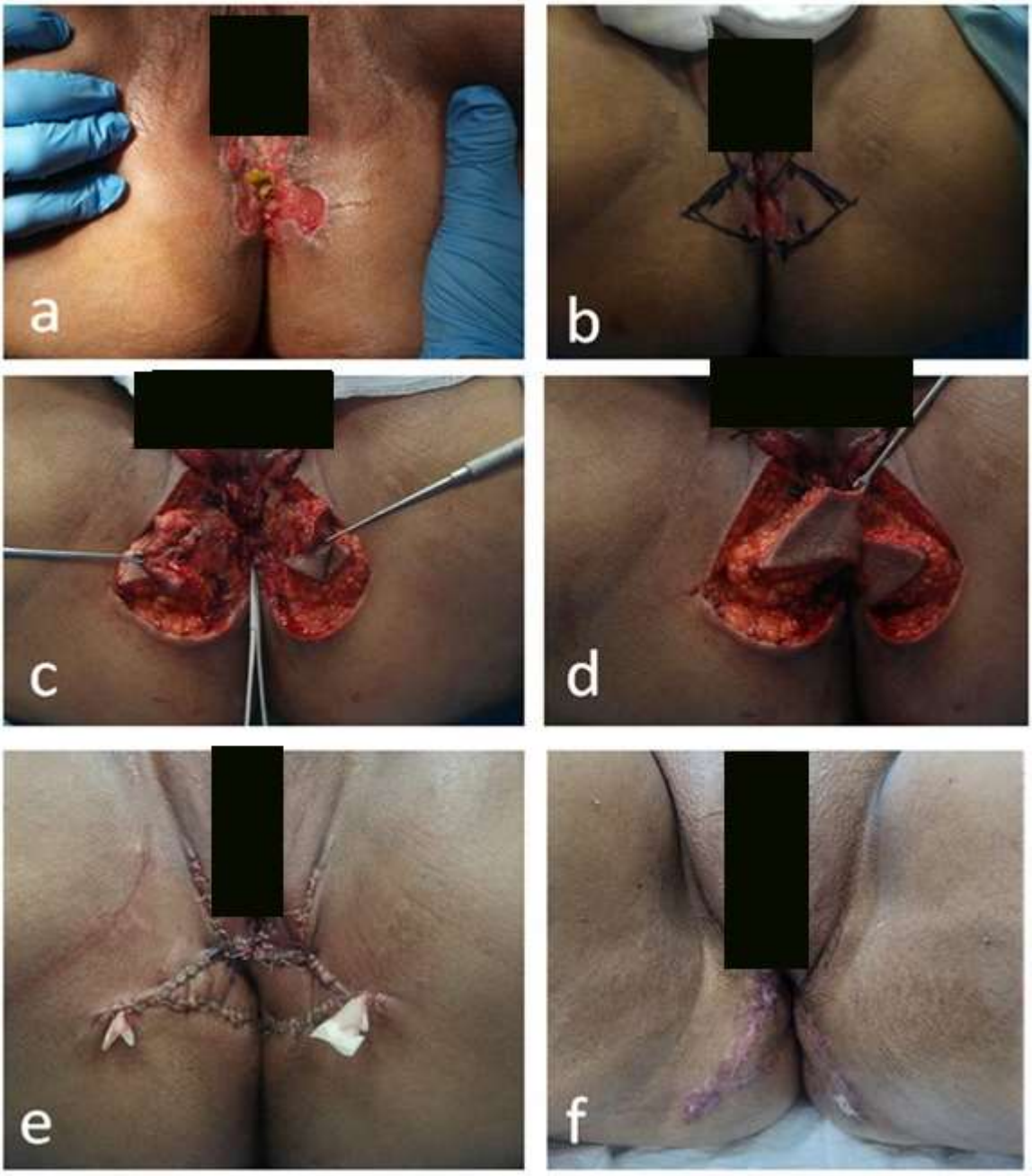


**Figure 1. a)** 5x5 cm perineal soft tissue defect extending from the posterior vaginal wall to the perianal skin. **b)** The design of the bilateral gluteal perforator-based V-Y advancement flaps. **c)** Elevation of the flaps. **d)** Advancement of the flaps to the defect. **e)** Closing of the defects. **f)** 6 month after reconstruction.

The sphincteroplasty was performed urgently by the general surgery team. The laceration line was extended bilaterally, and the retracted sphincter was dissected free from surrounding tissues and repaired end-to-end. The anterior rectal wall and perianal skin incision were primarily repaired. The anterior vaginal wall was repaired by the obstetrics team. Oral intake was withheld; the patient received parenteral nutrition for 2 days and then transitioned to a clear liquid diet.

On postoperative day 4, dehiscence was noted at the perineal incisions. A general surgery consultation revealed intact rectal mucosa but partial dehiscence of the perianal skin, with full rectal tone. Wound care was recommended. By postoperative day 17, increased tissue separation in the perineum prompted referral to our department. Examination revealed a 5x5 cm perineal soft tissue defect extending from the posterior vaginal wall to the perianal skin (Figure 1a).
Bilateral gluteal perforator-based V-Y advancement flaps were planned. On postoperative day 20, strong perforators were identified using hand-held Doppler (Figure 1b). After proper dissection and hemostasis, bilateral V-Y flaps were elevated based on the perforator and advanced to close the defect (Figure 1c-d). Penrose drains were placed, and skin and subcutaneous tissues were sutured (Figure 1e). The flap viability was evaluated with Doppler before concluding the procedure.
A clear liquid diet was continued for 10 days postoperatively, with daily wound care. On postoperative day 7, proximal suture line dehiscence was observed. Wound cultures were obtained, followed by irrigation, debridement, and re-suturing. Culture revealed Pseudomonas aeruginosa; an infectious disease consultation recommended piperacillin-tazobactam 4.5 g every 8 hours IV for 15 days. Follow-up cultures were sterile, and antibiotics were discontinued. Progressive granulation and epithelialization were noted. By postoperative week 3, epithelialization of the dehisced areas was complete, and the patient was discharged. The patient was followed for approximately 1 year. She was satisfied aesthetically and functionally, had good anal sphincter function, and reported no incontinence or sexual problems.

## Discussion

Fourth-degree perineal lacerations involve injury to the vaginal mucosa, perineal muscles, internal and external anal sphincters, and rectal mucosa, and reconstruction can be challenging. The reconstruction goals for perineal lacerations are to maintain sphincter muscle integrity, achieve tension-free skin closure with well-vascularized tissue, and ensure sufficient tissue volume to fill the dead space, minimize donor site morbidity, and achieve both functional and anatomical success [4,5]. After muscle integrity is achieved, reconstruction of the soft tissue defect depends on the size and composition of the defect, and surgical experience [5].

Various techniques have been used for the reconstruction of perineal defects. Minor soft tissue defects can be treated with primary repair, secondary intention, negative pressure wound therapy, and skin grafts [4,5].

Local flaps offer easy and quick reconstruction with the advantages of like-tissue reconstruction in the same surgical area. But, they are insufficient for large defects and dead space obliteration, and vascularity may be compromised after radiotherapy and extensive resection [5].

Regional flaps provide more voluminous tissues and more constant vascularization than local flaps [5]. The Singapore and Lotus petal fasciocutaneous flaps, which are based on the

internal pudendal artery are commonly used techniques for obstetric perineal defects with their advantages of being safe and ease of dissection, sufficient tissue volume to fill the perineal defect, and reliable vascularization [6,7].

Regional pedicle fasciocutaneous and myocutaneous flaps from the abdomen (e.g., rectus abdominis myocutaneous flaps), gluteal (e.g., superior and inferior gluteal artery perforator flaps), and thigh (e.g., tensor fascia lata flap, anterolateral thigh flap, gracilis flap) areas are useful in large defects requiring dead space obliteration and in patients whose perineal region has been affected by radiotherapy, infection, or previous surgery [5]. But, the main disadvantages are conspicuous scar, donor side morbidity, bulky reconstruction, sacrificing of muscle, dominant vessels, and final reconstruction option.

The perforator flaps, based on small branches of the dominant artery that perforate the muscle or fascia, are an alternative option for perineal defects. In our case, we managed the soft tissue defect after a fourth-degree obstetric perineal laceration using perforator-based bilateral V-Y advancement. V-Y advancement flaps are frequently used in obstetric perineal defects for their simplicity and effectiveness in preserving anatomical and physiological function. In this case, we used a perforator-based flap with several advantages, including a freestyle design with multiple perforators, a large arc of rotation, stable coverage, preservation of functional muscle, an acceptable contour, and minimal donor-site morbidity.

Perineal reconstruction requires algorithmic and multifaceted surgical planning based on the characteristics of the defect. Proper interdisciplinary communication is essential for delivering optimal care and managing complications effectively.

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